Enhancing Scientific Cooperation between the European Union and Central America

Fortaleciendo la cooperación científica entre la Unión Europea y América Central

Proceedings of the EU S&T experts' dialogue events – June 2010

Setting up the S&T dialogue through a continuous exchange of knowledge and flow of information

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EXECUTIVE SUMMARY

ENLACE[1] (Enhancing Scientific Cooperation between the European Union and Central America) is a project funded by the European Commission, under the Seventh Framework Programme for Research and Technological Development - International Cooperation.

The ENLACE project aims at supporting the bi-regional dialogue between the EU and the Central America Countries and includes a set of activities to enhance the networking among EU and Central America researchers through the organization of S&T dialogues, to identify research priorities of mutual interest and to raise awareness on FP7 in Central America mainly by setting up the network of FP7 National Contact Point in Central America.

The consortium includes 15 multi-skilled partners, 7 from the EU and 8 from the Central America, regrouping multiple international stakeholders (partners from research, industry, government and civil society) for research actions, that will ensure the fulfillment of ENLACE's objectives.

One of the activities planned in the frame of the ENLACE project is the organization of Experts' Dialogue in both regions. These Experts dialogues are conceived as bi-regional exchanges of ideas, trends and strategies. Moreover, these are expected to produce recommendations for such priority topics to be presented to the European Commission for consideration in future FP7 Work Programme and to establish a shared platform of RTD thematic priorities.

The present proceedings aim to provide the outputs of the first EU experts' dialogue carried out in the frame of the INCO Conference (1st INCO Conference "Supporting Research Integration") by the ENLACE consortium, during this event three mainly topics were developed by the ENLACE partners and the European experts: **Environment, Food, Agriculture, Fisheries, and Biotechnology, and Energy**.

These topics were based on the results of the survey carried out in Central America which principal goal was to identify the priorities in RTD formulated by the scientific community and the policy makers. The survey was carried out, first, by the way of a questionnaire sent to 50 researchers from Central American countries. A second step of the study consisted in interviewing 5 policy makers in each country about the state strategy on RTD and the priorities defined by the government on funding some specific thematic. The 5 countries from which we obtained answers are Panama, Costa-Rica, Nicaragua Honduras and Guatemala. The aim of 50 researchers has not been reached for the Panama and the Nicaragua where only, respectively, 34 and 26 researcher answered the questionnaire. The interviews with the policy makers are missing for Nicaragua. The initial outputs of this initiative were presented and discussed with European experts during **the first S&T dialogue event held on 11th June 2010, at the Royal Olympic Hotel in Athens**. The attendance discussed about their concerned field in order to establish RTD strategies and trends of common interest and benefit.

This first Expert' Dialogue gathered speakers coming from different horizons: European experts, academic researchers of Central America, national contact points from Europe and Enlace Advisory Panel. The event was structured as follows: an introductory session was presented by the ENLACE Project Officer. Then specific sessions were dedicated to Environment, Energy and Food, Agriculture, Fisheries, and Biotechnology. A conclusive session helped us to draw common conclusions.

The **introductory session** presented by Marialuisa Tamborra (Directorate D - International Cooperation, DG Research, European Commission and project officer of the ENLACE project), gives the overall policies of the European Commission (EC) in RTD and, in particular, the opportunities and instruments of the FP7 program. The EC wants to improve the participation of regions such as Central America in European projects (which has been very scarce until now), among others with the calls on SICAs (Specific International Cooperation Actions).

In the **Environment session**, important results obtained from policy makers and researchers

1 Further information: http://www.enlace-project.eu/index.aspx

of the five countries concern their priorities in international cooperation for RTD in environment. The researchers have been unanimous across countries quoting the fields of RTD in environment that demand international collaboration: Climate Change, Sustainable development, Sustainable management of resources. During the **Food, Agriculture, Fisheries, and Biotechnology session**, really divergent opinions on the Food thematic were revealed concerning the international collaboration. However, the opinion given by the researchers about the fields of RTD for these areas was common; they put sustainable production of goods and management of biologic resources and food, and health and wellbeing as priorities for international cooperation. In the **Energy session**, Policy makers and researchers have showed different priorities regarding research in energy. From the five countries only two have specific funding dedicated to research in the RTD field of energy. Costa-Rica invests 62 million US$ in a fund for atomic energy. Honduras has cooperation with Italy for research on hydroelectric energy. Finally, the researchers have given a common opinion about the fields of RTD for Energy that are demanding international collaboration: Bio fuel and sources and production of renewable energy.

INTRODUCTION

One of the most important goals of the ENLACE project is **to set up the S&T dialogue through a continuous exchange of knowledge and flow of information**. In order to reach these objectives different activities were carried out in both regions, Europe and Central America, through the identification of research organizations on the basis on their excellence RTD and the identification of Policy makers from each CA country who have given their point of view about S&T institutional setting, barriers of FP7 participation, specific needs as well as national RTD priorities. The information was obtained, firstly, by the way of a questionnaire sent to 50 researches coming from different experience in the FP7, and, finally, through the execution of 5 Policy makers interviews in each CA country. The information gathered was used to make one national report per country which includes the list of priorities identified by the research community and stakeholders. The matchmaking of these priorities was the basis of the Regional Report; this document will present the commonalities in RTD for the whole region.

This initiative also gave the topics discussed during the **first S&T dialogue event held on 11th June 2010, at the Royal Olympic Hotel in Athens**. The attendance discussed about their concerned field in order to establish RTD strategies and trends of common interest and benefit. The Experts dialogues are conceived as bi-regional exchanges of ideas, trends and strategies; therefore the second round of Dialogue will be carried out in 2011 in Central America and will focus on three themes of the first round in EU, Environment, Energy and Food, in order to complete the discussion on the above mentioned themes by involving Central American experts. The Experts Dialogues are expected to produce recommendations for such priority topics to be presented to the European Commission for consideration in future FP7 Work Programme and to establish a shared platform of RTD thematic priorities.

These proceedings are part of these objectives and show the outputs of the first EU experts' dialogue carried out in the frame of the INCO Conference (1st INCO Conference "Supporting Research Integration") by the ENLACE consortium, during this event three mainly topics were developed by the ENLACE partners and the European experts:

1. **Environment;**
2. **Food, Agriculture, Fisheries, and Biotechnology;**
3. **Energy**.

THE EXPERTS DIALOGUE

In the frame of the INCO conference (1st INCO Conference "Supporting Research Integration") the ENLACE project has organized the first Experts Dialogue on Environment; Food, Agriculture, Fisheries and Biotechnology; and Energy. The event aimed to discuss priority areas for scientific

collaboration following up on the consultation exercise carried out in five Central American countries: Costa Rica, Guatemala, Honduras, Nicaragua and Panama. The outcomes of the survey have been presented and discussed with EU experts in the concerned fields to establish RTD strategies and trends of common interest and benefit.

The first Experts dialogue was held on 11th of June 2010 at the Royal Olympic Hotel (Athens - Greece). The meeting was attended by the Partners' representatives of the ENLACE project, European Commission officers and the experts.

The first Experts' Dialogue was opened by **Diassina Di Maggio,** director of APRE and coordinator of the ENLACE project, thanking all the presents for attending the meeting and in particular HELP-FORWARD for hosting the meeting within the frame of the INCO conference organized by INCONTACT project. The representatives of the ENLACE partners, the EC officers and the experts were invited to introduce themselves as well as their main activities (see annexes).

The present document shows the outcomes of the dialogue based on the results of a survey conducted in five Central American partner countries in the concerned themes. The survey has delivered the state of Central American priorities and strategies in RTD. It was implemented in each country by a questionnaire applied to 50 researchers as well as interviews applied to 5 policy makers. The results presented here concern 3 thematic fields:

1. **Environment**
2. **Food, Agriculture, Fisheries and Biotechnology**
3. **Energy**

"POLICIES, OPPORTUNITIES AND INSTRUMENTS OF THE EUROPEAN PROGRAMS"

Marialuisa Tamborra, European Commission (EC)- DG Research, International Cooperation

Marialuisa Tamborra (Directorate D - International Cooperation, DG Research, European Commission and project officer of the ENLACE project), presents the overall policies of the EC in RTD and, in particular, the opportunities and instruments of the FP7 program. The EC wants to improve the participation of regions such as Central America in European projects (which has been very scarce until now), among others with the calls on SICAs (Specific International Cooperation Actions).

According to Ms. Tamborra, the European Research Area (ERA) - since the Lisbon Treaty- and the partnership between the EU and LA have been strengthen during these last years. Recent policy developments have led to:

1. Joint Initiative for Research and Innovation, launched by the Senior Official Meeting of Buenos Aires, Feb. 2010:

   • Focused on Energy; Environment and climate change, Agro-food; Health; Information and Communication Technology (emphasis on research infrastructures and e-infrastructures); and horizontal activities on S&T policy with emphasis on human and institutional capacity building;

   • Use of existing and new instruments.

   Recommendation by the EU-LAC S&T Ministerial Forum, May 2010, to EU-LAC Heads of State and Government to include the Joint Initiative for Research and Innovation in the corresponding Declaration and Plan of Action

   • The implementation will involve another SOM by the end of the year to agree on a roadmap.

2. Adoption of the « Joint Initiative » at the EU-LAC Summit, May 2010

3. Four commitments of the European to the Joint Initiative:

   • Promoting S&T cooperation in thematic

areas through enhancing LAC participation in FP7;
• Promoting S&T capacity building with development cooperation instruments and FP7 mobility actions;
• Promoting research uptake and innovation by setting up Knowledge and Innovation centres under an external relations instrument;
• Latin American Investment Facility (LAIF) – addressing the investment gap in infrastructures with co-funding under external relations instrument – 125 Mio Euro until 2013.

A. Future FP7 Work Programmes targeting Latin America

1. Future calls will identify specific topics for Latin America, in particular for the following areas:

   • Environment;
   • Health;
   • Food, Agriculture, Biotechnologies and Fisheries;
   • Information and Communication Technologies.

2. Specific Infodays will be organized.

B. S&T capacity building

- Using up the complementarities offered by other cooperation instruments, e.g. ALFA (75M euro for 2007-2013) and Erasmus Mundus (135M Euro for 2007-2013) ;
- Using up the potential of Marie Curie actions;
- Link with institutional and project promotion activities supported by the European Commission, e.g. projects like EULARINET[2], ENLACE, EUCARINET[3], INCONTACT, regular meetings of NCPs.
- Opportunities offered by @lis2 Programme (22M Euro for 2009-2012) in ICT, especially for the links with RedClara.

C. Knowledge and Innovation Centres

- Creation of networks that facilitate and promote the uptake of knowledge for social and technological innovation;
- Taking advantage from existing initiatives at the regional scale, e.g. AL-Invest;
- Coordinate with existing experiences at the country level;
- Use of ICT tools to support virtual networking.

D. Expectations from Expert dialogue process

- Bottom-up identification of common priorities for the EU and Central America;
- Link up to the extent possible with EULARINET in consolidating the priority setting results at the level of Latin America:
- EULARINET is planning Thematic workshops in the Fall 2010 on Health, Food and Agriculture, Health and Energy;
- Contribute to the preparation work of the roadmap jointly with EULARINET and EUCARINET.

E. Mid-term review of FP7

- **Objective of the mid-term review:**

✓ Re-orient activities based on an evidence-based evaluation of the activities undertaken in the first part of FP7, covering quality of activities, of implementation and management and progress towards the objectives set (Art. 7.2 of FP7).

2 The **EULARINET** Project (European Union - Latin American Research and Innovation NETworks) is a 4 years Coordination Action (INCO.Net). http://www.eularinet.eu/site/home/language:eng

3 The **EUCARINET** project is a four-year INCONET Coordination Action, supported by the European Commission (DG RTD-INCO), whose main goal is to strengthen bi-regional sustainable dialogue on Science and Technology between Europe and the Caribbean. http://www.eucarinet.eu/

- ✓ **A panel of 4 experts has been set up to assess the international Cooperation programme in terms of:**
  - ✓ The different schemes (INCO-NETs, BILATs, ERA-Nets, ACCESS4EU etc.) ;
  - ✓ A number of horizontal issues, such as activities of monitoring and evaluation, dissemination and awareness raising, training, support to policy dialogue etc;
  - ✓ Evidence collected mainly through projects' deliverables.

OUTCOMES

Diassina Di Maggio and Angeles Macias (MICINN – the Spanish Ministry for Science and Technology), mention the importance of cooperation in Central America between the ENLACE and EULARINET projects.

EULARINET is an INCONet (International Cooperation Networking) project funded under the Frame Program 7 of the European Commission and is in charge of the policy dialogue on RTD between Europe and the whole of the Latin American region (including the Central American region).

Angeles Macias announces a thematic workshop of EULARINET which will take place in September 2010 in Mexico. A Senior Officials Meeting (SOM) which will define more precisely regional policies is planned for November 2010.

The outputs of those events will be circulated largely to other project stakeholders such as those of ENLACE and EUCARINET.

CENTRAL AMERICAN PRIORITIES IN RTD

1. ENVIRONMENT

CA speakers: Jorge Mendoza –ECOSUR, Mexico

EU Experts: Paolo Favali- INGV, Italy and Achim Zickler- Germany

National Contact Point: Paola Materia –APRE, Italy

Introduced by Jorge Mendoza, representative of ENLACE project

Methodology

This paper is presenting the results obtained, first, by the way of a questionnaire sent to 50 researchers from Central American countries. A second step of the study consisted in interviewing 5 policy makers in each country about the state strategy on RTD and the priorities defined by the government on funding some specific thematic. The 5 countries from which we obtained answers are Panama, Costa-Rica, Nicaragua Honduras and Guatemala. The aim of 50 researchers has not been reached for the Panama and the Nicaragua where only, respectively, 34 and 26 researcher answered the questionnaire. The interviews with the policy makers are missing for Nicaragua.

Context

The results of the survey presented here are related with RTD in the specific field of **environment**. The characteristics of each country are compared in terms of funding and strength of research in each country. An important part is also dedicated to priorities for research and for international cooperation given by both, policy makers and researchers.

The funding strategy in RTD is really different from one country to another. Costa-Rica seems to have the most dynamic strategy by creating a "National Plan for Development" which had increased the fund dedicated to RTD of about 1% of GDP during the period 2006 - 2010. Panama does have a strategic plan for development of

RTD since the creation of SENACYT in 1997. The changes made in its organization in 2005 gave a rise to a national structure that is setting national strategies for development of research in Sciences and Technology. Guatemala has pushed the universities to invest in all research sectors and has encouraged them to cooperate at international level. Furthermore, Guatemala has invested 8 million US$ in several programs of research, such as FACYT, FODECYT, ACECYT and MULTICYT. Finally, Honduras does not have a real strategic plan for development of RTD except the program called "Honduras complite" that aims at increasing international cooperation.

In the survey, the researchers were interviewed about the strength in different research sectors in their country. It seems that, except for Panama, the countries are really involved in the environment RTD. The most quoted fields of research are sustainable development and climate changes. Costa-Rica and Nicaragua pointed out RTD in environmental technologies whereas Guatemala is involved in the field of sustainable management of resources.

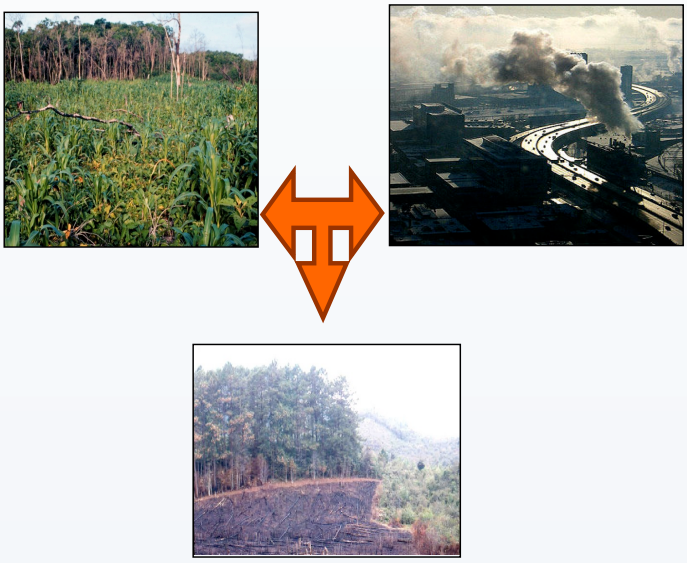
Important results obtained from policy makers and researcher of the five countries concern their priorities in international cooperation for RTD in environment. Policy makers from Costa-Rica put environment as a priority for international cooperation whereas the policymakers from other countries are less enthusiastic in that field. Indeed, Honduras and Panama are putting RTD in environment at the third place of priorities for international cooperation. Nevertheless, the policy makers from Honduras pointed out that there exist some cooperation programs mainly with Spain, but also with other European countries for research in environment. For Guatemala, RTD in environment is not a priority at all. The researchers from all the countries have taken an opposite position on this topic: they have all quoted RTD in environment as a priority for international cooperation.

The researchers have been unanimous across countries quoting the fields of RTD in environment that demand international collaboration:

- **Climate Change,**
- **Sustainable development**
- **Sustainable management of resources**

Outcomes

Jorge Mendoza focuses on the strong inter-connexion that exists between environment and the other issues to be discussed at this meeting: agriculture, food (ex: deforestation), biotechnology (ex: production of bio fuel) and energy (production of gas), as well as other topics, such as social welfare and health.



The Central American region is one of the richest in biodiversity, but has known important deforestation and erosion even if nowadays, this phenomenon has been diminished through the application of new technologies. The deforestation rate in CA was 1.46 % between 1990 – 2000 and 1.23 % between 2000 – 2005 and Latin America contributes with 4,8% of the total emissions of Greenhouse Gas (GHG).

The rate of DGP for Science and Technology are quite low in the region. The average figure is 0,25 % while only Costa Rica dedicates 1% to Sc&T.

The first challenge is to match European (among others those of FP7) and Central American priorities.

Paolo Favali (INGV - Italy) and **Achim Zickler** (Germany) agree on the fact that the Central American participants should be more precise o their OWN priorities and, among others, specify more the topics of the environment issue. Environment is a key issue for research, not only in Europe, but at a global level and it has to do, not

only with agriculture, food and energy, but with development as a whole in a global world. The experts note the lack of national strategies in some countries and strengthen the importance to have more preventive approaches.

According to **Paolo Favali**, for a good planning of a sustainable development the Natural Hazards, their affects and consequences have to be considered.

The main Natural Hazards in Central America are:

- **Earthquakes**
- **Landslides induced by:**
  - **Earthquake**
  - **Precipitation**
  - **Human activity**
- **Tsunamis**
- **Volcanic Eruptions**
- **Tropical storms**

Earthquakes

Earthquakes are considered a main hazard, given that they affect densely populated areas and their effects are often dramatic in terms of human and economic losses.

Landslides

Landslides and mudslides in Central America are generally triggered by earthquakes, precipitation or human activity (inhabitants settling on stream banks or in lands of hard slope), or combination of these three factors.

Tsunamis

Tsunamis are not considered a major hazard in Central America, people are not aware that they could be at risk and even recent tsunami events that occurred in the area have been forgotten. Despite this, recent studies have established that Central America is a moderately tsunamigenic zone.

What to do about these natural hazards

Records of natural disasters go back for about 500 years in Central America, during this period, the region has been hit constantly by earthquakes, landslides, tropical storms, volcanic eruptions and tsunamis. Nevertheless, there is few or no information regarding to these events (except for seismic data).

In order to understand better the natural hazards that struck the region the following task could be implemented:

- Characterization of all the hazards: multidisciplinary studies focused in the region that would allow to understand and tackle the events
- Volcanic monitoring
- Geological assessment: there is few information about the geology of the region
- Workshops of up-date techniques for people working with natural hazards surveys in the region
- Hazard assessment that allow to map the risk areas, evacuation routes and safe places in case of event
- Generate quality information and make it available for further research.

Achim Zickler, stressing the idea of "science for development", says it is compulsory to involve other stakeholders (such as NGO's and enterprises) in the definition of priorities and to present common strategies towards the EC and its programs, as well as to the national governments of the EU member states. Other DG's of the EC as well as all the national governments have research programs and funds. It is of great importance to investigate those paths.

According to **M. Zickler** the meeting was characterized by heterogeneous composition of participants and resulting interests and it was difficult to achieve mutual consent on aims, objectives and results. Specifically from EU policy making side, there was no convincing coherence in strategic aspects overlapping themes, interests and objectives, which cannot be overcome in a bottom-up approach by the ENLACE project synergies between different EU programmes and directorates are not yet visible. The discussions were hampered by an asymmetric representation of researchers, policy makers, programme owners and stakeholders. The outcome of the first report/questionnaire has to be reconsidered:

- There is no priority setting between CA states on policy level;
- Priority findings do not match with priority topics of some CA states, i.a. geosciences, earthquakes, volcanism etc
- EU programmes impose their own research agendas on CA agendas.

M. Zickler suggests that it could be useful to realign ENLACE project to its original objectives: policy-level dialogue on and coordination of research priorities in sustainability research of mutual interest and to add the symmetric inclusion and participation of policy makers and topic relevant stakeholders. He concludes saying that it is necessary taking in account the stronger and coherent leadership on project management level, the transparent and reliable agenda setting and the stronger alignment with sustainability research programmes on national level.

Paola Materia, the NCP environment at APRE says that the areas where Europe and Central America can cooperate is most in prevention on areas such as: coastal management, natural hazards, soil fertility, management of the sea.

Ulyses Cortes from UPC (Barcelona) strengthens the fact that the challenges are now in the environment technology transfer. Hence the importance to use "RedCLARA" and its databases: a very useful ICT instrument establishing links between Latin American and European researchers http://www.redclara.net

Henning Jenssen notes the limitations of FP7 and understands the ENLACE project has been designed to match FP7 areas of interest, while the research landscape is much more larger than declared and there are a lot of interesting programs (on hazards prevention, vulcanology, toxicology...) in Central America supported by important European and other countries in the world. But research communities are still very small. It is possible to set priorities only with a critical mass of research programs and actors. It should be useful to foster the strengths in the different fields mentioned before.

Jorge Mendoza concludes saying there are obviously big differences in priorities between Europe and Central America, while this region is principally concerned by some urgent development issues like the recovery on food for damaged areas and physical security related to climate changes.

2. FOOD, AGRICULTURE AND FISHERIES, AND BIOTECHNOLOGY

CA speakers: René Noé –UPNFM, Honduras

EU Experts: Jorge Saludes -AINIA, Spain and Georges J. Nychas - Greek Food

National Contact Point: Diassina Di Maggio –APRE, Italy

Introduced by René Noe, representative of ENLACE project

Methodology

This paper is presenting the results obtained, first, by the way of a questionnaire sent to 50 researchers from Central American countries. A second step of the study consisted in interviewing 5 policy makers in each country about the state strategy on RTD and the priorities defined by the government on funding some specific thematic. The 5 countries from which we obtained answers are Panama, Costa-Rica, Nicaragua Honduras and Guatemala. The aim of 50 researchers has not been reached for the Panama and the Nicaragua where only, respectively, 34 and 26 researcher answered the questionnaire**.** The interviews with the policy makers are missing for Nicaragua.

Context

The results of the survey presented here are related with RTD in the specific field of **Food, agriculture and fisheries as well as biotechnology.** Such as in the field of environment, the characteristics of each country are compared in terms of funding, strength and priorities of research since the general funding strategy in RTD differs from one country to another, this affects also RTD in food, agriculture and fisheries, and biotechnology. In all countries, this is regarded as an essential field of research since it is straightly related to human welfare and food security. By example, the policy makers from Honduras pointed out that they implement some cooperation programs with Germany in the field of natural resources and communitarian development.

As a result of the survey, all researchers pointed out that some research projects are going on in the fields of "**sustainable production of goods and management of biologic resources**" as well as "**Food, health and wellbeing"**. Costa-Rica and Guatemala researchers have pointed out some research in the field of "**biotechnology and biochemistry for sustainable production**".

Important results obtained from policy makers and researchers of the five countries are the priorities they are giving to the international cooperation for RTD in food, agriculture and fisheries, and biotechnology. The policy makers from the studied countries have really different opinions on priorities concerning international cooperation in these sectors. Whereas, Panama and Honduras have pointed out Food as, respectively, the first and second priorities for their RTD programs, Policy makers from Guatemala do not even quote once this field of research as a priority. The policy makers from Costa-Rica told that Food is not a priority for their strategic development of RTD but they have put it as the second priority for International cooperation.

The researchers have been unanimous across countries in quoting the fields of RTD in food, agriculture and fisheries, and biotechnology that demand international collaboration:

- **Sustainable production of goods and management of biologic resources**
- **Food, health and wellbeing**

Outcomes

Those fields of RTD are still of utmost priority in Central America (before the two other areas discussed in this meeting), while there is an important need of capacity building in those areas of research. They are also straight linked to other priority issues such as health and education.

In those fields, cooperation must be carefully

designed, defining research priorities directed to concrete human development responding to basic needs. Agroindustries should develop.

In this area as in the other ones, only Panama and Costa Rica have defined strategies.

Giving an example of RTD in plant toxicology and quality management, **Jorge Saludes (AINIA, Spain)** stresses the usefulness of transatlantic cooperation in this field, and not only for the benefit of Central America, but at global level. This supposes again a sufficient critical mass of material and human resources, but is absolutely feasible. The cooperation with the industrial sector is here of utmost importance to reach efficiency.

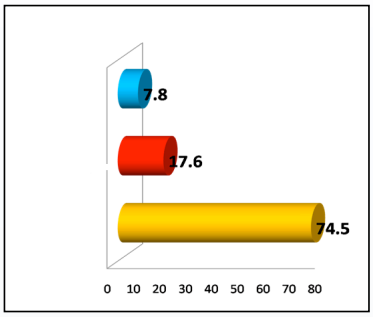
M. Saludes said that despite the geographical diversity of Central America, as region subject of the reflexion on the RTD priorities, consistent similarities were found among the participants towards the selection of issues to be tackled in future calls. In the framework of the research priorities, it is remarkable the increasing relevance of the impact on the economical activity and the effect on the SME activity for the future, as background for the election of research priorities. He also said that the diversity of contacts, both from the national point of view and also from the institutional origin too, was determinant to make this event a unique opportunity for the dialogue on the trends of RTD and the networking for future partnerships.

Diassina Di Maggio, the director of APRE presents the "BIOCIRCLE"[4] project in the frame of which a brokerage event will be organized in September 2010 in Brussels.

René Noe presented the main issues and points to be discussed during the meeting:

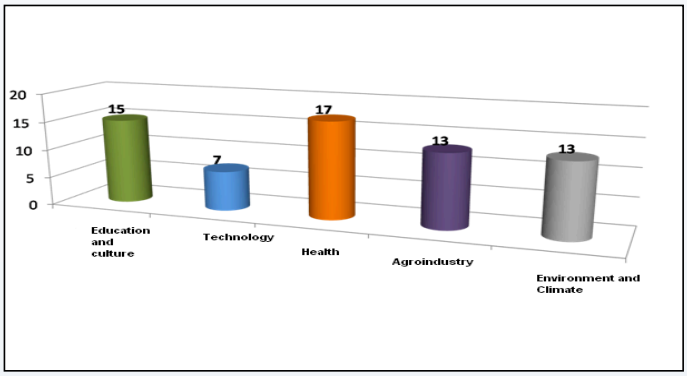
- Closed instrument: Com-Glob-Chall;
- Research priorities differ (instrument reports on cited subjects, Example: Natural disaster management not listed);
- Cooperation-Enhanced-Balance;
- Only CR & PAN have defined strategies.

He explained the AC main areas of **Food, Agriculture and Biotechnology:**



- Don't Know
- From fork to Farm
- Sustainable production and management of biological resources of land, forest and aquatic environment

He also presented the main S&T needs and priorities should be the greatest support through EU and CA collaboration.



René Noe concludes saying that we have to bridge gaps, not only between Central America and Europe, but also among Central Americans.

1. In CA Honduras, Panama and Costa Rica have similar priorities;
2. Food-Agriculture-Fisheries needed but Health & Environment are a concern;
3. Balance needed in areas of interest CA-EU.

4 http://www.biocircle-project.eu

1. ENERGY

CA speakers: Henning Jensen – UCR, Costa Rica

EU Experts: Ioannis Vougiouklakis –CRES, Greece and Massimo Busuoli –European Strategic Energy Technology Plan Secretariat -EU

National Contact Point: Konstantinos Karamanis – EKT, Greece

Introduced by Henning Jensen, representative of ENLACE project

Methodology

This paper is presenting the results obtained, first, by the way of a questionnaire sent to 50 researchers from Central American countries. A second step of the study consisted in interviewing 5 policy makers in each country about the state strategy on RTD and the priorities defined by the government on funding some specific thematic. The 5 countries from which we obtained answers are Panama, Costa-Rica, Nicaragua Honduras and Guatemala. The aim of 50 researchers has not been reached for the Panama and the Nicaragua where only, respectively, 26 and 28 researcher answered the questionnaire. The interviews with the policy makers are missing for Nicaragua.

Context

The results of the survey presented here are related with RTD in the specific field of **energy**. Such as for the two above quoted fields, the characteristics of each country are compared in terms of funding, strength and priorities of research. Since the general funding strategy in RTD differs from one country to another, this affects also RTD in energy.

Also in the energy sector, the funding strategy in RTD really differs from one country to another. From the five countries only two have specific funding dedicated to research in the RTD field of energy. Costa-Rica invests 62 million US$ in a fund for atomic energy. Honduras has cooperation with Italy for research on hydroelectric energy.

As a result of the survey, the researchers stressed the fact that in their five countries, efforts are made in RTD project aimed at developing Bio Fuel. Costa-Rica, Panama and Guatemala add that research projects are going on the fields of production and sources of renewable energy. Nevertheless, it came out that Honduras and Nicaragua do not have other fields of research in energy. Important results are obtained from policy makers and researcher of the five countries in priorities in the area of international cooperation for RTD in energy. Policy makers and researchers give different levels of priority to the cooperation for research in energy according to the countries they are coming from. In Costa-Rica and Honduras, both policy makers and researchers have placed RTD in energy at the fourth place out of eight sectors. Research in health, food and environment are taking the top three places in these two countries. On the contrary, policy makers and researchers from Guatemala and Panama have put RTD in energy respectively to the first and second places of their priorities for international cooperation.

The researchers have been unanimous across countries in quoting the fields of RTD in energy that demand international collaboration:

1. **Bio Fuel**
2. **Sources of renewable energy**
3. **Production of renewable energy**

Outcomes

M. Jenssen presented the "Research Perspectives on Energy at the University of Costa Rica", according to him, the idea of producing electricity is from the sunlight is attractive, but in practice the technology to do so is expensive. The need to tackle global climate change and energy security makes developing alternatives to fossil fuels crucial. Photovoltaic conversion of solar energy has so far been dominated by solid-state devices, usually made of silicon and profiting from the expertise of the semiconductor industry. In this regards, Costa Rica has the great advantage of being geographically positioned in a region of almost all-year sun expectation. The aims

at CELEQ are developments of new materials, reactions, and processes that enable the capture and conversion of solar energy. Indeed, CELEQ has recently launched a research program based on development of novel dye-sensitized solar cells for the production of electricity. The research venues that are now being explored at CELEQ include the synthesis of novel light-trapping structures to boost the light-harvesting capacity of photoreceptors on the flat device surface. The isolation of dendrimeric-like structures bring together donor and acceptor features of selected molecules. Furthermore, the functionalization of titanium dioxide (TiO_2), a semiconducting material and low-cost precursor, by the attachment of the organic light antenna is highly desirable and is also part of the ongoing research. A screening study of some promising natural dyes extracted from the Costa Rica rich variety of endemic plant is under way. Learning and mimicking the nature pathway transformations we might be able the building of new solar cells. Given the unique photoelectrochemical behavior of ruthenium when surrounded by chosen organic molecules acting as scaffold is of great interest and most prominently the synthesis and characterization of multiple ruthenium bonding is another research topic at CELEQ. It is worth mention that the researchers at CELEQ are members of NanoFem laboratory (www.nanofem.ucr.ac.cr) with different chemical expertise in areas as follows: inorganic, supramolecular and organometallic synthesis. Moreover, interdisciplinary collaborations and strategic partnerships with others constarican universities are a great asset of the research group. The quest for academic exchange either of researchers or students will indeed strengthen the research at CELEQ.

Globally, renewable energies provide only about 3.5 percent of electricity and even less of transportation fuels. No technology provides a one-size-fit-all solution, but a combination can create a robust energy supply. CELEQ has potentially strong interest by key alliance in the participation and development of the following topics: production of ethanol using banana and pineapple cellulosic residues, biofuels obtained from microalgae, hydrogen production by photo- and electrochemical ways and ocean wave power.

Henning Jensen stresses the importance of developing alternatives to hydroelectric energy which is still quite small. The principal future sources of energy in the region are solar, geothermic and biofuels.

By example, in the area of solar energy, INTEL (from ...) is launching a research program and has a production plant in Costa Rica while Guatemala is developing research in bio-fuels.

For development of alternative energy sources, there is a huge potential and large interest in developing nanotechnologies and the use of new materials in the frame of strategic cooperations with Europe in interdisciplinary teams. But this field is still fallow in Central America.

Massimo Busuoli (EERA) stresses the strong interest of Europe for Renewable Energy collaborations and presents the European instruments for support, such as ERAliance which is a collaborative European network for research and innovation developing capacities and synergies in all kind of energy sources including all potential renewable energies. The network, driven by the industries and SME's is open to other countries and supports industrial initiatives in fields such as construction and household energies.

The cooperation between centres inside Europe is of greatest importance to match successfully policy goals. Similar alliances between C.A. countries would be of large benefit. http://www.eera-set.eu

The EERA initiative and its interlink with the SET-PLAN have been presented to the Central America representatives interested in energy topics. The EERA was initially founded by 10 national research organisations spread around Europe.

Currently, more than 70 research organizations, universities and industry partners are participating in the different research programme initiatives which are currently originated inside it into the form of self funded joint research programmes.

The EERA initiative, conceived with the close collaboration and support of the European Commission, aims to strengthen, expand and optimise EU energy research capabilities through the sharing of world-class national facilities in Europe and the joint realisation of sustainable, pan European research programmes.

The primary focus of the EERA is on the strategic and targeted development of future generations

of energy technologies by drawing on results from fundamental research and maturing technologies to the point where they can be embedded in industry-driven research.
EERA could represent an interesting collaborative counterpart for the CA stakeholders, being the international cooperation one of its strategical approaches.
From the presentation received about the current identified priorities in the Energy area in the CA countries it came out that:
There is a need for a more detailed mapping about the potential subtopics of interests in the field of renewable:

1. Such a mapping can be usefully exploited for the creation of critical mass of players in the CA countries in the same research area (e.g. wind, photovoltaic, etc...)
2. This could lead to a CA Energy Research Alliance inspired in the organisational model and strategical approach by the EERA
3. This new alliance can represent in the future the CA counterpart of potential collaboration in the energy field with Europe

Ionnis Vougliouklakis (CRES, Greece) The principal target of RTD in this field is "efficiency". Other sources of energy should also be considered in Central America, such as wind, photovoltaic and biomass energy.

M. Vougliouklakis gave the effort to present and associate with the countries respective interests, the physical and technical potential to develop installations that exploit Renewable Energy Sources either for power generation or for transport and domestic use.

Emphasis was given to recent technological developments for all different RES technologies and the possibilities that exist for knowledge and technology transfer activities between Europe and Central America.

In respect with the specific meeting, it was stressed out particularly the possibilities (technological and fiscal) to develop either products or installations in the field of solar energy and biofuels which have the biggest potential in the countries of Central America and in most cases still remains untapped.

Following questions that were raised, it was also discussed very briefly the fiscal parameters that still constrain the development and commercialization of many RES applications and how targeted R&D activities could assist to overcame these barriers and promote commercial and competitive RES solutions in the field.

A brief overview of the European situation was also given, in order to present and highlight some key instruments that are used for achieving national and European standards. References were made in relation to the EU SET-Plan and the upcoming National Renewable Energy Action Plans.

Henning Jensen concludes stressing the urgent need of mapping material and human resources and potentialities of Central America in this field, obviously taking into account the protection of biodiversity. http://www.cres.gr

CONCLUSIONS

Christiane Daem, representative of ENLACE project

Concludes the meeting resuming the main issues which have been discussed and stressing the fact that this is a first of a series of experts' meetings to establish a dialogue among European and Central American Research stakeholders; a dialogue which must at the end of four years, conclude in a consolidated report with comparative tables taking into account the own plans and needs of the Central American Region.

Challenges for further discussion:

- National strategies in RTD should be clearly defined by the policy makers in all Central American countries;
- Priority topics in RTD should be précised by the Central American stakeholders (including researchers, policy makers, Industries, NGO's...);
- Central American priority settings should be taken in account by the European programs.

ANNEX

ANNEX I

Attendance list

Organisation	*Country*	*Name*	*Contact*
European Commission	Belgium	MariaLuisa Tamborra	http://ec.europa.eu/index_en.htm
MINCYT	Spain	Angeles Macias	http://www.micinn.es/portal/site/MICINN
INGV	Italy	Paolo Favali	paolofa@ingv.it
	Germany	Achim Zickler	achim-zickler@t-online.de
AINIA	Spain	Jorge Saludes	jsaludes@ainia.es
Greek Food Authority	Greece	Georges J. Nychas	gjn@aua.gr
CRES	Greece	Ioannis Vougiouklakis	ivougiou@cres.gr
Energy SET PLAN secretariat	Italy	Massimo Busuoli	massimo.busuoli@bruxelles.enea.it
Hellenic documentation centre	Greece	Konstantinos Karamanis	karamanis@ekt.gr
CONACYT	Mexico	Hector Samano Rocha	hsamano@conacyt.mx
ICTP	Italy	Fernando Quevedo	http://www.ictp.it/
SICA	Guatemala	Rosa María Amaya	http://www.concyt.gob.gt/
APRE	Italy	Diassina Di Maggio Monique Bossi Paola Materia	http://www.apre.it/
CERCAL	Belgium	Christiane Daem Charles Plaigin	http://www.ulb.ac.be/soco/cercal/accueil.html
UPC	Spain	Soraya Hidalgo Ulises Cortes	http://www.upc.edu/
HELP-FORWARD	Greece	Epaminondas Christofilopoulos Constantine Vaistas	http://www.help-forward.gr/
LAI	Austria	Christina Schmutzhard Claudia del Castillo	http://www.lai.at/

MENON	Belgium	Jimena Arango	http://www.menon.org/
TETALAP	Hungary	Emese Karacsonyi	http://www.tetalap.hu/
UCR	Costa Rica	Filiberto Vega Cascante Henning Jensen Pennington	http://www.ucr.ac.cr/
CONICYT	Nicaragua	Abel Reyes Barreda	http://www.conicyt.gob.ni/
USAC	Guatemala	Antonio Mosquera Aguilar	http://digi.usac.edu.gt/
UPNFM	Honduras	Mebreño Truman Bitelio René Antonio Noé	http://www.upnfm.edu.hn/
UNACHI	Panama	Clothilde Arrocha	http://www.unachi.ac.pa/
ECOSUR	Mexico	Jorge Mendoza Vega	http://www.ecosur.mx/
CSUCA	Guatemala	Raul Salguero	http://www.csuca.org/
FECAICA	Guatemala	Ana Morales	http://www.fecaica.org/

ANNEX II

Experts' CVs's

1. Paolo Favali - Istituto Nazionale di Geofisica e Vulcanologia

Prof. Paolo Favali was graduated in 1976 cum laude in Geological Sciences at the University "La Sapienza" of Roma, with specialisation on Geophysics. Researcher since 1979, presently he is Research Director since 2000. He has about 30 years of experience with main fields of interest in Natural Hazards (mainly Seismic), Seismotectonics, Geodynamics, Applied Geophysics and Environmental Sciences.

He cooperates in research and technological projects with many Italian/International Universities, Scientific Institutions and Industries.

He has been teaching "Physics of Solid Earth" and "Earth Physics" in Italian Universities since 1994; University of Basilicata (1994-1997), University of Chieti (1998-2004) and University "La Sapienza" of Rome (2005-on). Tutor of many students during their degree and PhD theses. He is convenor since 1996 of International Scientific Conferences. In 1999 he was editor of a volume edited by Elsevier titled "Science-Technology Synergy for research in marine environment: Challenges for the XXI Century" (Developments in Marine Technology, vol. 12). In 2004 he was editor of a number of Environmental Geology edited by Springer (vol. 46/8). In 2006 he was editor of Annals of Geophysics "Special issue dedicated to Giuseppe Smriglio. From land networks to seafloor observatories", (vol. 49/2-3). Member (1999-2003) for the European Science Foundation of the Detailed Programme Group SEIZE (Seismogenic Zone Experiment) of Ocean Drilling Programme. He is Member since 2005 of the Steering Committee of the European initiative "The Deep-Sea Frontier".

Co-ordinator of the following projects for the development and scientific use of multidisciplinary seafloor observatories and networks, and related infrastructures:

GEOSTAR 3rd EC-MAST Programme (1995-1998);

GEOSTAR 2 3rd EC-MAST Programme (1999-2001);

TYDE Access to EC Research Infrastructures (2000-2003);

ORION-GEOSTAR-3 5th EC framework Programme (2002-2005);

MABEL National Programme for Antarctic Researches (PNRA) (2000-on);

PEGASO Regione Siciliana (2005-2008).

Presently he is Co-ordinator of the Preparatory Phase of the ESFRI infrastructure EMSO (European Multidisciplinary Seafloor Observatory) project funded by European Commission in the frame of FP7- INFRASTRUCTURES-2007-1 (project n. 211816, 2008-2012).

Since 2000, in the frame of the 5th, 6th and 7th Framework Programme of the European Commission, he acts as Expert Evaluator of projects.

Representative of INGV since 1995 inside the International Ocean Network (ION), which is aimed at promoting activities for the development of the marine monitoring networks an inter-association entity of the International Union of Geodesy and Geophysics (IUGG). Head from 2001 of the Marine Unit of INGV, RIDGE Unit (GEomarine InterDisciplinary Researches) which was and is involved in many national and international projects (e.g., EC-ASSEM, SN-1, ECESONET- CA, FIRB-APLABES, DPC-V2, DPC-V5, DPC-S2, EC-MOMARNET, EC-KM3NET DS,

EC-NEAREST, EC-NERIES, EC-TRANSFER, EC-ESONET-NoE, EC-HYPOX).

He published more than 100 papers on International and Italian Journals, and Proceedings (see selected list of publications on International Journals from 1998).

2. Achim Zickler – Germany

Born in Germany in 1945, **Achim Zickler** has a Master-Degree (Dipl. Phys.) in Physics from the Ludwigs-Maximilians-University, Munich and Studies of physics and meteorology at universities in Marburg and Munich.

After an important experience of more of 30 years, Achim zickler has been working as Head of Division for research in Sustainability in Production and Services (resource efficiency, environmental technologies, water and wastewater technologies, land use management) since 2007; he also is Coordinator for German-Brazilian Cooperation in Research for Sustainability in the Federal Ministry of Education and Research.

Some of important posts he occupied: Head of Division for Global Change research (climate change, biodiversity, megacities) Federal Ministry of Education and Research; Counsellor for Science and Environment, German Embassy in Brasília, Brazil. From 1993 to 2000, he was Director for Chemical Research and Technology at the Federal Ministry for Education and Research, in Bonn. He also occupied relevant positions as Founding Director for Human Frontier Science Program (HFSPO), (fellowships and workshops) in Strasbourg, France; Deputy Head of Division for research management in health/medical technology, biotechnology, physical and chemical technologies, global change research at the Federal Ministry of Education and Research, Bonn (BMBF); Head of Department, Project Management Office at the Center for Radiation and Environmental Research, Munich, Germany and he was also Assistant Professor for Physical Chemistry, Technical University of Berlin, Max Volmer Institute for Biophysical Chemistry and Biochemistry

3. Jorge Saludes - Ainia-centro tecnológico-Spain

Born in Valencia, Spain, in 1958, **Jorge Saludes** has a Degree in Veterinary Science, a Post Graduate in Technical Direction and Production and a Degree in Business Administration.

After a wide experience of 18 years in different enterprises and projects, he has been working as Head of International Project (Business Unit) of AINIA Centro Tecnológico for the last 10 years, in the identification of new markets and opportunities of business development for the institute outside Europe in matters related to Food Technology, Food Safety, Environmental technologies for food industry, Quality and HACCP, Analytical control and Transfer of Food Technology.

He has relevant experience as international assessor to different international missions and coordination of the cooperation projects.

He has experience as international expert in

missions of:

1. Identification of Technical Assistance Cooperation Projects in the Food Sector.
2. Identification and formulation of projects of technical assistance in the field of food safety.
3. Coordination and consultancy with different countries regarding to the food sector, and
4. Technological Diagnosis of Food Industry

As specific experience in the region of Latin America and The Caribbean:

1. Coordination of Projects of Transfer of Technology in Peru, Mexico, Dominican Republic, Uruguay and Brazil with finance of the Spanish Agency for International Cooperation (AECI), IDB and the European Union.
2. The Coordination of missions in Ecuador, Colombia, El Salvador, Chile and Argentina.
3. Identification and inception missions in Argentina, Uruguay, Chile, Peru, Bolivia and Uruguay.

4. Georges J. Nychas – Greek Food Safety Authority – Greece

Prof. Nychas has a Bc.S in Food Science & Technology, Agricultural University of Athens, a Ph.D, In Food Microbiology; University of Bath, and a Post-doc in Toxin Production by *Staphylococcus aureus* of the University of Bath, UK.

Since 1997, He has been working as Professor of Food Microbiology, in the Agricultural University of Athens, Dept. Food Sciences & Technology, Lab. of Microbiology & Biotechnology of Foods. Since 1994, he has been Head of Laboratory of Microbiology and Biotechnology of Foods. He is member of the Biohazard Group of European Food Safety Authority.

Recently published papers

- Nychas G.J.E. & Arkoudelos J.S (1990) Staphylococci: their role in fermented sausages, In: Staphylococci, Eds D. Jones, R.G. Board and C. Collins, Symposium Series No. 19, Society for Applied Bacteriology, London: Blackwell Scientific Publishers. Journal of Applied Bacteriology 67, 130S
- Tassou, C.C., Drosinos, E.H. and Nychas, G.J.E. (1995) Effects of essential oil from mint (*Mentha piperita*) on *Salmonella enteritidis* and *Listeria monocytogenes* in model food systems at 4 and 10 oC. *Journal of Applied Bacteriology,* 78, 593-600.

5. Ioannis Vougliouklakis - CRES Market Development Department - Greece.

Dr Ioannis Vougiouklakis is the head of CRES Market Development Dept., responsible for co-ordination and management of projects in the areas of market analysis and development, energy statistics as well as technology transfer activities in the field of RES & EE.

He has been involved the last 5 years in actions concerning energy policy and market development projects, supervision of energy statistics databases, monitoring, and evaluation and reporting of energy data along with capacity building actions. Additionally, he has been active in following legislative and fiscal issues in the energy field and preparing relevant studies.

Within his role as head of the Market Development Dept. he has been responsible for the development and promotion of market mechanisms and tools, along with the formulation of market strategies & support mechanisms for energy technologies.

He is also responsible for CRES's strategic marketing, market surveys, the international co-operation projects and CRES's networking activities. He has a continuous participation from 2008 and onwards in National committees for the transposition of EU directives in the field of RES/EE as well as for the development of national programmes and incentives in the field.

He has a number of publications in scientific journals, special editions, peer-reviewed conference papers, workshop proceedings and monographs and has given numerous presentations at national or international conferences-workshops. He holds a PhD Degree and Diploma in Mechanical Engineering and was prior employed as a research agent at the JRC-Institute for Energy of the European Commission in the Netherlands.

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