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Impact Assessment of the Specific Programme International Science and Technology Cooperation (INCO) under the Fifth Framework Programme (1998-2002)

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An Impact Assessment of the Specific Programme International RTD Cooperation Fifth Framework Programme (1998-2002)

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1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

Under the 5th and 6th Framework Programmes[1], the INCO Programme represented a fundamental part of a European Research Policy, which was increasingly based on Science and Technology (S&T) policy dialogue with partners in third countries, aimed at promoting the development of long-term durable research partnerships. INCO also aimed to increase coordination of Member States' bilateral cooperation and to support the implementation of Community policies with respect to third countries.

INCO's strategic activities were targeted at the Accession Countries, other Central and Eastern European Countries, the New Independent States of the former Soviet Union, the Mediterranean countries, and developing countries. To exploit fully the opportunities for co-operation and to optimise added value at European level, the programme facilitated co-operation with certain industrialized and emerging economy countries and was responsible for increasing the opportunities for training researchers and for co-ordination with other FP5 programmes and Community initiatives, Member States and international organisations, and co-operation schemes such as COST and EUREKA.

This is the Final Report from the European Evaluation Consortium (TEEC) on the Impact Assessment of the International Science and Technology Cooperation (INCO 2) Programme. The objective of this assessment was to perform an analysis of the impact of INCO's activities on the generation of societal impact and in relation to strengthening human and institutional capital relevant to the international challenges it set out to contribute addressing. The evaluation was carried out by a team of external experts between January and September 2005 taking into account past, present and future aspects of the programme as DG Research moves towards the 7th Framework Programme. However, the main focus for the assessment was the INCO 2 Programme 1998 – 2002.

The evaluation comprised in-depth desk research on the achievements and scope of the INCO 2 Programme within its European Research policy context and the context of EU international science and technology cooperation. This situation was compared with that of a number of other global players with a view to understanding the objectives, approaches and achievements of these entities and countries in the field of international science and technology cooperation. Evidence of impacts inside and outside Europe was then sought via a series of in-depth structured interviews with EC officials in DG Research and other Directorates General active in the area of third country cooperation (DGs International Relations, Development, Environment, etc.),

[1] The Fifth Framework Programme was the European Community mechanism to support research, technological and demonstration activities between 1998 and 2002. The Sixth Framework Programme provided support between 2002 and 2006. The Seventh Framework Programme will provide support between 2007 and 2013.

and those representing scientific organisations inside and outside Europe. This qualitative data was then synthesised with quantitative inputs from an on-line survey that attracted over 350 responses from stakeholders of over 50 nationalities, one third of whom were located in third countries.

This document presents the experts' findings from the impact assessment of INCO 2 and makes conclusions and recommendations to the European Commission, as it prepares to shape the role of international scientific collaboration for the next 7 years, under the 7th Framework Programme.

1.2 CONCLUSIONS

From the work of this study involving *inter alia* interviews within and outside the Commission, an on-line survey, and desk study of a wide range of documentation and quantitative data a number of conclusions can be derived based both on the assessments and views of others and the analyses of the study team itself. These are set out below.

The nature and basis of the INCO programme

- Under FP5 (and FP6) INCO represented a key component of European research policy based increasingly on S&T dialogue with third country partners. The programme can now look back on around 20 years of international scientific cooperation delivering objectives embracing sustainable development and generating research partnerships. The programme has had a geo-political structure for the funding of specific research activities that recognised EU policy concerns but has also had responsibilities elsewhere for example in support for COST and EUREKA and monitoring international activities in thematic areas of FP5 (and FP6) as well as providing allocations to INTAS. The diversity of these activities is striking and a range of particular implementation instruments was also used.

- The need for a specific EU-third country research programme is seen by some to be important as thematic programmes in the FPs are viewed as having a strongly Europe orientated focus that does not embrace the special conditions required by researchers in third countries. INCO is well known in these third countries particularly in the developing world.

- However the result of this varied remit is that INCO might appear as a somewhat disjointed research programme embracing a wide range of different aspects of science that on first analysis might not seem to be logically connected. The particular niche occupied by INCO is perhaps somewhat difficult to define and explain to the outside world largely because despite its achievements it is too diverse and ambitious especially in the context of the funding allocated to it. Anyway from a scientific standpoint it is not sufficient to be seen to be filling gaps left by other programmes in the FP or formulating scientific priorities on the basis of geo-political objectives and the requirement to cooperate internationally when this latter factor would anyway be relevant to a whole variety of scientific research.

- So INCO really needed to have a niche that had a clearer scientific essence demarcating its place in FP5 and 6 that was obvious to the scientific community and differentiated it from other programme areas – but without losing its international standing and the policy relevance that it responds to. The question for the future is how should this be articulated? There are a number of possible solutions to this and some ideas have been developed in the present study.

Benefits and achievements

- The EU provides almost one third of the world's scientific knowledge and the case continues to be made for it doing even more. International cooperative research is a component of this effort and it has the benefit of breaking down barriers and facilitating European competition. Also EU researchers gain access to knowledge produced elsewhere and conversely the S&T capacity of the EU brings benefits for partners in areas where there is recognised European expertise. At a practical level it also provides European access to local knowledge in a range of situations and enhances European scientific prestige by developing the capacity to face and solve problems outside its own frontiers.

- There is certainly a view that Europe should remain open to addressing needs through scientific research outside Europe as science is necessarily international. More specifically however INCO has been able to focus some scientific capabilities on the needs and conditions of developing countries. The development of relationships with such countries and with EU near neighbours – for example new Member States where INCO was a pioneer in forging relationships – can be highlighted as a significant impact of the programme. INCO therefore has a profile of its own in achieving a focus on strengthening relations and building partnerships between the EU and partner countries often as a result of political dialogue and awareness of third country perspectives. In this the value is perhaps more strongly felt in third countries than in Europe though this might be expected. Also INCO is a brand that people recognise particularly in third countries so at least this level of awareness has been created.

The geography-science axis

- Certain areas of research lend themselves to international cooperation as their pursuance would not be credible in any other way – environment is a clear example. However for INCO certain target countries and regions are identified which are not just science-driven but relate to widely defined socio-economic needs and these can be diverse.

- INCO is often credited with a focus on developing countries but it is not surprising that such pre-determined geographical and linked scientific priorities exist as the EU and its Member States provide over half of all formal international development aid.

S&T Agreements

- The EU has signed a number of S&T Agreements with third countries. Such agreements are seen by some as an increasingly important feature in the fulfilment of EU policy objectives and the involvement of third country institutions in relevant

S&T cooperation. Certainly in some countries they are a vital facilitating legal instrument but in other instances the requirement for such a legislative vehicle is not so clear-cut.

- Whatever the circumstance it is important that the Agreements are given substance through the provision of resources that can guarantee their implementation with tangible scientific downstream actions rather than the act of signature of the agreement itself signifying the final stage of the process. This has not happened and so it is not always easy to see pragmatic scientific outcomes from many of these agreements.

Coordination

- In FP5 and more particularly in FP6 a coordination role for INCO was a specified activity. This coordination was envisaged both within the FP itself to provide synergy, and with Member States and other Community external policies. It was a difficult remit, in relation to Member States especially, and does not seem to have received much emphasis or resources.

- This situation will need to change substantially in the proposed operation of FP7. A key objective of ERA is to reduce the fragmentation of research effort in Europe and there is still much to do at the level of national/regional programmes. At the level of the FP itself it will be important that some strategic overview of international cooperation is developed and reported on. Indeed the importance of this role should be that it is not just reactive but catalytic and used as leverage to promote international cooperation in all facets of FP7.

S&T policy dialogue

- Within INCO content and its priority-setting has increasingly been based on dialogue at various levels – international, bilateral, trans-regional. A breadth of features have been covered as an element of fulfilling policy aims because the INCO programme has clearly recognised these as it matured.

- This process needs to continue and indeed be amplified in anticipation of FP7 and for other reasons. In particular in the Commission itself some feel that more formal arrangements should be put in place to complement informal contacts in order to stimulate a better relationship between capacity-building and provision of skills and competences in certain third countries to the benefit of all concerned stakeholders.

Aims and objectives of INCO

- All the main objectives of INCO in FP5, which was a horizontal programme rather than one concerned with specific thematic scientific areas, were addressed and much of the resulting work programmes brought about their achievement in various ways. In FP6 the INCO approach was perhaps less individualistic as policy dialogue outside increased but appropriate policy goals were again addressed and achieved.

- However analysis of quantitative information on the scientific activities implemented can lead one to question the eventual impact of the achievement of the stated

objectives and the extent to which this happened. This is particularly difficult to assess even now. INCO is a small programme both in terms of manpower and financial resources yet has been given an ambitious and diverse international remit. Such a mismatch is unlikely to maximise overall impact in spite of the obvious energies and dedication of those involved. FP7 should be seen as an opportunity to correct this.

Strengths and weaknesses

- The strengths of INCO include its ambition, its pioneering third country involvements in the FP, its provision to third countries of the funded opportunity to participate in the FP before it was "opened to the world" in FP6, and its provision of research for development. This positive legacy must not be lost and indeed should be built on in FP7.

- The weaknesses of INCO include its seeming lack of scientific coherence across its sub-programmes and apparent absence of a clearly differentiated essence, distinctive from other FP programmes, that the scientific community could associate it with particularly as FP6 became open internationally. The positioning of INCO was therefore somewhat unclear in FP5 and increasingly so in FP6. In addition the allocated funding to INCO was too small to satisfy its ambitions (which might have helped to make it more differentiated) and so insufficient account was taken in FP5 of either the needs or infrastructure required in developing countries. Third country researchers also find the administrative logic of the programme difficult to understand.

- With such a small funding allocation strategic choices were not clear-cut and detailed examination of the INCO sub-programmes in FP5 demonstrates this. It is worth re-emphasizing here that INCO in FP5 (INCO-2) had a budget representing around 2.5% only of the total FP5 allocation as implemented by DG Research and only around 0.1% of the budget allocated by the 15 Member States to research. Such a budget allocation is dwarfed by some of those provided to other programmes within FP5.

Aims and positioning of comparable institutions

- S&T international cooperation policy as examined in other countries and their national institutions revealed a strong emphasis on promoting investment in innovative research in order to strengthen business, trade and scientific renown at an international level thereby strengthening a country's position as a "global player". There was a focus on large research projects based on international scenarios often with an industrial and business thrust. The facilitation of international collaborative research as a result of signed agreements and arrangements with other countries, thereby forming strategic alliances, was seen as an important tool.

- More scientifically-driven features that were seen to be benefits of international S&T cooperation included the attraction of R&D investment to increase the social and economic impact of research; keeping national researchers at the forefront of science; allowing national scientists access to foreign research facilities; promoting mobility of professionals at various levels in various ways; building international

partnerships in order to address particular remits; implementing both medium and long-term projects; and involving a range of sectors – industry, government, academia with a view to achieving large innovative research projects of an international dimension.

INCO now and in the future

- A positioning for a research programme that is solely dependent on international cooperation as its *raison d'etre* does not provide it with sufficient differentiation from the rest of the scientific enterprise for its purpose to be immediately obvious to all. For INCO this is aggravated by the fact that its remit is so wide and diverse. The backcloth it provides to the outside world is one in which it was difficult in FP5 to see coherence. There has also been a communication problem in addressing this situation. Targeted information to audiences globally has not been adequate to explain INCO and its approach.

- But the actual operational experience of INCO has significant value and could be put to good effect in future programmes of FP7 that have a third country component. Furthermore the acronym of INCO, though perhaps inappropriate to the overall international cooperation character to been found in the proposed FP7, has a resonance in developing countries so some feel that its loss is a mistake.

- There is a great opportunity in the proposed FP7 to maximise the benefits from international cooperation. Although recognisable past components of INCO are to be found in the Capacities programme aspects of international cooperation can be found in all of the FP7 programmes. In particular it is in the Cooperation programme where third country involvements of substance might be predicted to occur. The People programme has a significant responsibility for mobility and the Ideas programme embraces "the best researchers from third countries".

- For the international cooperation activities specified in the Capacities programme, where elements of the former INCO programme are still recognisable, two foci of operations might be foreseen:

  One focus would emphasize what has been called in this report Development Science (DS) where projects or initiatives might be put in place that do not duplicate other areas in FP7 but have unique characteristics such as being "bottom-up" (as a result of their formulation by appropriate platforms of stakeholders), catalytic (in stimulating other projects downstream in other FP7 sub-programme areas) or seed-corn in nature laying a foundation for the future. In some cases there should be close involvement with other sub-programme thematic areas where third countries (especially developing countries) have significant involvements even to the extent of the DS focus providing the management of these.

  The other focus of activity would be concerned with International Cooperation Science Policy (SP) responsibilities. This would involve coordination and monitoring of international cooperation both within FP7 and in the context of ERA so providing an overview portrayal or "glue" for the FP as a whole. It would

also catalyse action as a result of the leverage that such a monitoring and coordinating role would achieve.

1.3 RECOMMENDATIONS

As a result of the study the following ***RECOMMENDATIONS*** are made**:**

The legacy of INCO

- The institutional memory and accumulated legacy from previous INCO programmes such as INCO 2 in FP5 should be regarded as valuable assets to be built on in the future

Keeping future fora for global issues

- The positive impact of INCO in providing a European research forum where under-researched global issues of concern could be addressed was an important priority and should be maintained. The focus here should be one of developing partnerships between EU and non-EU research groups in a flexible way and in particular fostering mobility. The required actions must be clearly defined and not simply represent aspirations. One way to achieve tangible outcomes would be to establish platforms of communication and implementation involving all stakeholders.

Establishing simpler procedures

- A number of INCO societal objectives in partner countries are ambitious and are more likely to be achievable if administrative procedures for funding scientific projects are simple and flexible. This has not always been the case and researchers and other key stakeholders have faced particular constraints. This is not acceptable particularly for research that has significant policy objectives at an international level. It needs to be better addressed.

Communication and dissemination

- Communication of the benefits offered by INCO to the various stakeholders and members of the public must be given more emphasis. At present the programme does not appear to be well enough appreciated and much greater visibility is needed through a stronger focus on information and communication actions and their targeting.

Bottom-up approaches and the involvement of others

- A greater emphasis on more inter- and intra- Directorate-General networking within the Commission is seen as essential for a programme with the geo-political characteristics of INCO as constituted in FP5 (and FP6). Serendipitous reliance on the enthusiasm of individual *fonctionnaires*, though praiseworthy, is not enough in itself and needs to be complemented with more formal communication channels, for example with DGs that have experience and information relevant to planning the research inputs needed in third countries. Furthermore even more emphasis needs to be given to the views of third countries themselves to maximise the value of “bottom-up” approaches.

Coordination activities

- INCO needs to get a better grip of the sort of coordination activities that featured in the FP5 work programme. In particular the potential and range of activities that is likely to result from international cooperation under FP7 make this coordination role and the achievement of an overview crucial if disaggregated approaches are to be avoided. The need here in future will be to monitor, portray, and stimulate international scientific cooperation as a whole across the FP.

Programme focus and targeting

- The differentiation of INCO from the Framework Programme as a whole in FP5 (and FP6) has not been easily portrayed to the outside world. A clear understanding needs to be articulated of the difference between a dedicated international cooperation programme such as INCO (and any successor to it) and international cooperation as it is understood throughout the scientific world as a regular component of scientific research. The actions pursued in the INCO programme (or any successor) and the instruments utilised will need a careful focus in order to demonstrate this differentiation and achieve a recognisable impact.

Geographical categories

- The instruments used in the countries or regions specified as INCO targets need to be chosen carefully if impact is to be maximised. More broadly the requirements of some countries or regions may be very “needs-driven” and very relevant to INCO objectives whereas in other cases “mutual interest” may be appropriate for involvements with some FP thematic areas. This is likely to be particularly relevant in FP7.

Future operationalities

- The future management of INCO activities (or its successor) is very much a matter for the Commission to decide on. However in the FP7 proposal the recognisable successor components of INCO can be found in the Capacities programme under the heading of Activities of International Cooperation. To deliver these activities two operational foci can be proposed. The first is a Development Science (DS) focus responsible for particular research actions in cooperation with third countries. The second is a science policy (SP) focus responsible for developing an overall portrayal of international cooperation activity across the entire FP and stimulating and monitoring it while taking action to achieve coordination and coherence in the FP itself and more widely.

- The two foci would work together dynamically and complement each other though one (DS) might originate its thinking from more “bottom-up” needs-oriented perspectives relating to third countries while the other (SP) would perhaps see a more “top-down” origination of third country involvements from a perspective of the FP as a whole. The aim of this duality of approach would be to preserve the legacy of INCO while further capitalising on the opportunities for international cooperation throughout the whole of FP7 and outside it. Both approaches could contribute leverage and catalysis for third country involvements.

2. BACKGROUND TO INCO

The section provides an overview assessment of the past, present and evolving context of EU policy in terms of science and technology (S&T) research, as it relates to international cooperation.

2.1 THE HISTORY OF EU INTERNATIONAL COOPERATIVE RESEARCH

Framework Programme involvements with third countries began in 1983 under the label of Science and Technology for Development (STD1, 2 and 3) with all countries mainly in health and agriculture sectors. In 1984, International Scientific Cooperation (ISC) focused on target countries with economic agreements with the then European Community (EC) in regions such as Latin America, Asia, and the Mediterranean, based on bilateral S&T dialogue over a broad range of topics prioritised country by country thereby representing the precursors of the S&T Agreements negotiated over the past 10 years. After the Rio Summit in 1992 and the Maastricht Treaty the S&T cooperation policy merged with STD 1-3 and ISC to form INCO (International Cooperation programme) in FP4[2].

INCO combined thematic and geographic approaches with developing countries (DEV), Mediterranean partner countries (MED), Central and Eastern European countries (CEEC), Newly Independent States (NIS) of the former Soviet Union, and non-European industrialised countries. Some of these labels were adjusted slightly in future years but the thrust of the target areas remained the same.

Favoured projects were those affecting global development in sectors such as health, agriculture, energy, and natural resources management. Through various instruments, professional skills were promoted, innovation encouraged as a result of the transfer or adaptation of technologies/know-how, young researchers trained, South-South collaborations promoted and S&T collaboration made global.

There were also some more specific initiatives. For example, INCO–Copernicus was a more strategic approach in FP4 and FP5, in that cooperation with Russia and NIS was particularly fostered in order to enhance their research potential and bring about restructuring to provide relevance to regional, social, economic and environmental needs in particular. There was even a “special” Copernicus Call in 2001 focusing on post-conflict problems in the Western Balkans, especially in the health and environmental sectors.

The INCO programme also had other responsibilities and involvements such as negotiation of the S&T Agreements put in place with third countries (as already mentioned), the provision of funding to INTAS, funding provision for the COST (European Cooperation in the field of Scientific and Technical Research set up in 1971) secretariat, the AVICENNE cooperation framework (with social, economic, and financial as well as scientific provisions) between the EU and 12 non-Member States (MS) in the Mediterranean region.

[2] The Fourth Framework Programme provided support for research, technological and demonstration projects between 1994 and 1998.

By the advent of FP5, the so-called INCO 2 had embraced a new area of developing policy research in the DEV sector assessing policy options in a period of economic globalisation, pressure on natural resources, and unsustainable demographic growth, poverty and inequality. In FP6, policy-related activities had a focus on strengthening multilateral co-ordination and defining research priorities. For FP7, at the time of writing the policy debate was on-going and setting a framework and planning was under discussion, not least in recognition of the fact that research continues to become more expensive so integration and the continuing development of the European Research Area (ERA) remain a key element.

So one can now reflect on 20 years of international research cooperation from a European perspective with the objectives of promoting sustainable development and generating S&T research partnerships. The production and use of scientific knowledge remains the driving force in EU relations with third countries and it is increasingly recognised that European socio-economic aims require improved mobilisation and mobility. Increasingly therefore, priority-setting is based on dialogue at various levels – international, bilateral and trans-regional.

2.2 PAST POLICY CONTEXT

International S&T cooperation is a fundamental part of European research policy and makes a significant contribution to other policy areas, not least because globalisation of knowledge and skills is intrinsic to globalisation of trade and finance. The EU has a broad spread of policy issues and objectives to embrace, often in the difficult context of involvement with, or demarcation from, particular objectives of MS. A flavour of some of these is provided in the following paragraphs.

In a broad, generalised context there is recognition that as a result of cooperating internationally, EU researchers get access to knowledge produced elsewhere and conversely the S&T capacity of the EU benefits the international community and partners in areas where there is recognised European expertise. So such cooperation brings added value to the S&T endeavour and economic progress within the EU.

Until recently it might be said that there were three strands to EU relationships with the world elsewhere – trade policy, development and the political dimension. Now there is recognition of a need for others, such as defence capability and security and specifically science-related endeavours, such as involvements in AIDS, famine, migration, drugs and even terrorism[3]

The EU provides almost one third of the world's scientific knowledge and the case continues to be made that it must do more. One aspect of this is international cooperative research which also has the added benefit of breaking down barriers and allowing European competition with the world, whilst recognising that industrialised countries and increasingly segments of emerging economies especially, are both likely partners and competitors.

[3] see Bibliography Section 2.3: Reference 32w The EU and the World

The EU together with its Member States also provides over half of all formal international development aid. So not surprisingly there are some pre-determined geographical and linked scientific priorities – for example, emphasis on sustainable development in DEV. Other priorities are, and have been, paramount in other regions such as stabilising RTD in Russia and security issues in the Mediterranean.

There have been other particular policy priorities to address at various times such as enlargement of the EU to 25 MS and the precursor initiatives involving such New Accession States (NAS) in the FP RTD effort. More recent policy concerns have included other prospective candidate countries such as Bulgaria, Romania, Turkey and possibly Croatia; the involvement in the setting up of the International Science and Technology Centre (ISTC) in Moscow (for shifting emphasis to civilian priorities for research effort) and the funding of INTAS to address some related policy issues in these regions. Even more recently, European neighbourhood policies have resulted in country strategy papers and action plans for countries such as Egypt, Lebanon, Armenia, Azerbaijan, Georgia, and Ukraine. The purpose of "Action Plans will be to define a joint agenda for relations with the EU for the following three to five years, with the objective of deepening political cooperation and economic integration"[4]. It is true that while particular action plans may not specifically mention S&T cooperation, other areas with scientific requirements such as environment are often specified.

While not a sovereign nation state, and therefore only holding observer status in a number of international bodies and agencies, the EU is an increasingly vital player as a result of its size and financial commitments. Development aid has already been mentioned and development policy issues are constantly subject to policy analysis in DG Development and more widely. It is worth noting here that external aid instruments are now implemented by the EU through a single department – the EuropeAid office- with responsibilities for the whole project cycle. Furthermore, there are important international agreements with EU involvement, such as Cotonou (a framework for a 20 year partnership for development aid to Africa-Caribbean-Pacific countries (ACP), various UN and UN-related actions through UNEP, UNCTAD and similar, international concerns on global issues such as climate change as agreed under the Kyoto COP agreement, and joining of the Codex Alimentarius Commission – a joint FAO/WHO endeavour addressing food safety.

There are various other socio-economic sectors in which the EU has developed and continues to develop policy agendas into which S&T can be positioned whether directly or indirectly. Some of these are addressed in individual Directorate-Generals (DG) of the Commission other than DG Research, others are addressed by the European Parliament and its committees and by Council itself. Examples here include:

Fisheries – where there are partnerships with third countries (fisheries partnership agreements – FPA) and conservation and sustainability issues to be addressed not least in the Mediterranean.

Environment - where scientifically there is a wide range of international issues concerning lands, seas, rivers and atmosphere where problems do not respect political

[4] See Bibliography Section 2.3: Reference 15w European Commission – External Relations: European Neighbourhood policy – the next steps. Press release by Commissioner Benita Ferrero-Waldner

frontiers so international cooperation is the only viable approach; other problems concerning sustainable development, green diplomacy concerns, application of multilateral agreements and other aspects of international relations, and regional cooperation (e.g. Mediterranean).

European Security and Defence Policy (Council) and Common Foreign and Security Policy (RELEX) – where there are ongoing operations, a developed security strategy, initiatives such as the fight against terrorism, development of common strategies and positions, promoting of international cooperation and the role of external representation where *inter alia* research and technical development is a specified role.

Education and training – where through using the open method of coordination as appropriate the aim is to develop quality of education by encouraging cooperation and supporting and supplementing actions embracing for example Member State mobility, recognition of degrees and learning in new technologies.

Energy – involving energy cooperation for example with developing countries, developing partnership with Russia to modernise infrastructure, promoting energy efficiency and environmentally friendly technologies, through AGORES[5] (as an EU and national strategy) to increase use of renewable energy.

Mobility and communications - where despite the progress in the EU on personal mobility and movement of goods, present day transport is likely to become unsustainable so requiring new transportation solutions; the need to further develop communications (eEurope and the education strategy are relevant to this) underpinning the knowledge-based economy that is the stated Lisbon objective.

From a purely scientific standpoint, certain areas of research particularly lend themselves to international cooperative research approaches notwithstanding any policy priorities. Environment has already been mentioned in this context (perhaps especially atmospheric research, marine and freshwater research and land use issues such as desertification), but other thematic issues such as health planning and policy, drug abuse, food safety and agricultural supply, cultural heritage requirements, AIDS and other epidemic diseases and humanitarian aid more generally are all valid examples. Some of these fields of research are strongly pursued cooperatively with third countries as a result of the negotiation of S&T agreements with the EU. Such negotiated agreements are in themselves an increasingly important feature in the fulfilment of EU policy objectives and the involvement of third country institutions in relevant S&T cooperation.

The above brief description of EU policy considerations with third countries and the interfacing of international cooperation and S&T illustrates the breadth of features that might qualify for inclusion in any EU international cooperation research programme in S&T such as INCO. It is a challenging scenario. A further level of complexity also arises in the difficulty of the EU position in the coordination of MS activities relating to international cooperation and S&T.

[5] – A Global Overview of Renewable Energy Sources. See Bibliography Section 2.3: Reference 30w-European Commission DG Energy and Transport

However in recent years especially, the geo-political axis of EU policy concerns has been greatly amplified through regular dialogue with several regions recognising the essential element of scientific cooperation in the fulfilment of policy aims. Examples of the regionality of such dialogue include ACP-EU, ASEM[6], ALCUE[7], MOCO[8], Russia and NIS and Western Balkans. These dialogues are also embedded in wider EU foreign policy actions and intervention instruments such as MEDA[9], TACIS[10], PHARE[11] and EDF[12]. The way in which this wide range of input and policy features finds expression and eventual implementation through the international cooperation research programme, INCO, is outlined in the following section.

2.3 THE NATURE OF THE INCO PROGRAMME

From the beginning of the INCO programme in FP4 a key aspect of the programme structure has been a geo-political one. In INCO 1 (FP4) the programme was broadly divided into three parts, one concerning S&T cooperation in Europe (one component being cooperation with other fora such as COST, EUREKA and international organisation; another being cooperation with countries of central and eastern Europe - CEEC and NIS); a second concerning cooperation with non-European industrialised countries; and a third with S&T with developing countries where sustainable management of renewable natural resources, sustainable improvement of agricultural and agro-industrial resources and health were each identified.

In INCO 2 (FP5) the programme had three main components – cooperation with third countries, training of researchers, and coordination. Training of researchers was fulfilled mainly by award of bursaries for young researchers from developing countries and, for example, Japan fellowships for European researchers in industrial research areas. Coordination activities endeavoured to ensure synergy and coordination between INCO and other programmes and the MS and other Community external policies. Tangible features of this coordination component were support for the COST secretariat and also that of EUREKA. In terms of cooperation with international organisations, health issues were particularly prominent. Otherwise however, despite virtuous aspirations expressed in the work programme, particular coordination actions are difficult to identify and their implementation difficult to detect. It is worth emphasising that one aspect of this coordination activity was to be within FP5 itself, in that international cooperation with third countries could now be pursued through the specific (thematic) programmes of FP5 and one role of INCO was to monitor the extent of this participation, its benefits and its conformity with the Community's external policy

[6] Asia-Europe Meetings

[7] Latin America, Caribbean and EU

[8] Monitoring Committee for Euro-Mediterranean S&T Cooperation

[9] The Euro-Mediterranean Partnership

[10] Provides technical financed assistance and grants for know-how to support the process of transferring to market economies and democratic societies in the Community of Independent States (CIS) and Mongolia

[11] Programme of Community Aid to the Countries of Central and Eastern Europe

[12] European Development Fund for ACP Countries

- including assessment of whether such participation should be subject to the conclusion of an international S&T agreement.[13]

The major component of INCO in FP5 was cooperation with third countries. Again as with INCO in FP4, the basis of targeting was largely geographical with five identified groupings: countries that were candidates for accession to the EU; Central and Eastern European countries (CEEC) that were not candidates for accession; Mediterranean partner countries (MPC); developing countries; and emerging economies and industrialised countries.

Within the cooperation with third countries component the range of activity content was very broad with no clear coherence visible. Examples are:

- Support 20 Centres of Excellence
- Support pluralistic S&T systems in the countries aiming at a range of regional problems and consolidation of S&T potential
- A specific Call for the Balkans post-conflict focussing on regional problems of environment and industry, and health
- Concentrating on five strategic areas in the Mediterranean rim (socio-economic modernisation; water resources; cultural heritage preservation; healthy societies; regional environmental sustainability) that thematic programmes are not supporting. Defined through Euro-Mediterranean dialogue.
- Other identified priorities of regional transport; linguistic diversity; mutual interest (not only European).
- Tackling the challenges for developing countries – sustainable development and its tools; natural capital and the human environment including health. Many sub-areas have been defined here including forestry, natural resource use, water management, land use, staple crops, aquaculture, fisheries/coastal zones, planning, health systems, knowledge systems and policies.
- S&T Cooperation Agreement activities

The diversity of these various activities is striking as is the weighting to particular geographical categories apparently deemed to be of real European importance. Within these categories the instruments used can also vary (and the logic is not always clear). For example, the types of action supported involved shared-cost actions; training fellowships; research training networks and thematic networks; concerted actions; and accompanying measures. The use of these instruments varied between Calls and Programmes. The specification of areas deemed candidates for attracting proposed research are not just science-driven but largely related to widely defined socio-economic or socio-geographic needs. The rationale for inclusion or exclusion of any particular proposed piece of work could therefore be difficult to argue on scientific grounds. In some areas, for example, a case might be made for inclusion of a vast range of scientific endeavour. However, some priority areas were identified such as Balkan reintegration and diseases affecting the poorest populations.

[13] As expressed in FP5 INCO Work Programme 2001 page 17 under C – Coordination the "Priorities" will include "assessment of participation opportunities to determine whether such participation should be subject to the conclusion of an international agreement".

Overall, it is worth reiterating that the main objectives of the INCO programme (a horizontal programme rather than one concerned with specific, thematic, scientific areas) in FP5 were:

- to promote RTD co-operation internationally to reinforce Community capacities in the fields of science and technology;
- to generally support the achievement of scientific excellence within the wider international framework;
- to contribute to the implementation of the Community's external policy also with the accession of new members in mind.

As a result the formulated strategic objectives for INCO in FP5 were:

- to promote scientific and technological co-operation between undertakings, organisations and researches from third countries and from the Community, likely to produce significant, mutual and balanced benefits, taking into account the different needs and circumstances of individual groups of countries and regions whilst respecting the protection of intellectual property;
- to facilitate access for research centres and undertakings established in the Community to scientific and technological knowledge available outside the Community and useful to the Community's interests;
- to enhance the position and role of Community research in the international scientific and technological arena and to promote a European scientific and technological culture, taking account of the social and cultural needs of the countries with which it is co-operating;
- to prepare for the accession of new Member States, e.g. by encouraging their full association with the framework programme; to contribute to the stabilisation of the RTD potential of the Central and Eastern European Countries (CEECs) in general and of the Newly Independent States of the former Soviet Union (NIS), to support and develop the Euro-Mediterranean partnership and to contribute to the sustainable economic, social and scientific development of developing countries;
- to help European research players acquire information and gain experience of research capacity, activity and priorities of industrialised third countries and "emerging economy" countries, so as to make Community industry more competitive and enhance its presence on new markets.

The match of much of this work programme structured to key EU policy drivers at the time is clear enough. Whether, however, the outcomes make for a coherent research mission has to be a matter for debate.

In INCO in FP6, much of the content embedded in INCO 2 was continued and further developed but with the important exception that within the ERA concept the international dimension of it was now decided (COM92001)345 of 25 June 2001) whereby the FP was open to the world so that without much restriction third countries could apply as full partners in proposals for full involvement in projects and receive funding (see first dash point below).

So in FP6, international S&T cooperation is driven through three components:

- The opening of the seven priority thematic programmes (Integrating and strengthening the ERA) to third countries, including the opening of specific activities covering a wider field of research;
- Specific measures in support of international cooperation;
- Funding for third countries under the heading Strengthening the ERA – Human Resources.

The third dash-point above now deals with mobility and education/training issues through Marie Curie actions grouped as such in the Human Resources and Mobility programme.

The second dash-point - Specific measures in support of international cooperation – represents what was the major INCO component in FP5 (cooperation with third countries) and in FP6 has come to be known as INCO 3. These dedicated international support activities are relevant to some groups of countries or regions not addressed by the FP6 Thematic programmes[14]. They are to support in particular the Community's external relations and development aid policies, in particular the fight against poverty, the EU Water Initiative and the commitment towards the Millennium Development Goals (MDGs).

As with FP5, the basis of the targeting approach is geographical. Four groups of countries are involved under the banner of cooperation with third countries:

- Developing Countries
- Mediterranean Partner Countries
- Western Balkan Countries
- Russia and the other NIS (New Independent States)

In addition there is a further banner of

- Multilateral coordination of national RTD policies and activities with the title of "Strengthening of coordination with other foreign policy instruments and definition of research priorities"

The stated objective for the INCO approach in FP6 is "to lend support, in the S&T field to the implementation of the Community's foreign policy and development aid policy and to strengthen, develop and consolidate our Partner countries' research systems, as a means of reinforcing synergies with these external policies". Furthermore, the research undertaken must contribute to the solution of specific problems in third countries through equitable partnerships. The policy origin of all this is clear enough.

Certain instruments are available for implementation of the overall programme objectives. These are Specific Targeted Research Projects (STREPS), Specific Support Actions (SSAs), and Coordination Actions (CAs). Also it is recognised that

[14] See Integrating and Strengthening the European Research Area – Specific Measures in Support of International cooperation (INCO) 2004 Work Programme which states (Page 20) that "dedicated international cooperation activities which are relevant to some groups of countries or regions…will support in particular the Community's external relations and development aid policies….".

diverse objectives and approaches are justified in order to accommodate different needs in different regions of the world. Some examples are given below:

Developing Countries have thematic priorities that are based on Community dialogue with bodies such as ASEM, ALCEU and EU-ACP Forum to discuss S&T cooperation and priority areas. Based on the Council's decision, the Thematic Areas are (i) Health and Public Health (reproductive health, health care system policy and management, neglected communicable disease); (ii) Rational Use of Natural Resources (humid and non-humid ecosystems, multiple demands of coastal zones, arid and semi-arid systems); (iii) Food Security (health of livestock, bio-diverse, bio-safe, value-added crops, aquatic farming).

Mediterranean Partner Countries have thematic issues concerning the (i) Environment (management of water resources, water policy and planning, water consumption issues, and water treatment, water-related risks, seismic risks, renewable energy and its cost-effectiveness) (ii) Cultural Heritage (materials, artefacts and monuments, preservation methodology, risk assessment and preventive conservation); (iii) Health (epidemiological trans-border surveillance and control, health care organisation, preventing genetic disorder, trauma and conflict interventions).[15]

Western Balkan Countries merit Health and Environment research efforts, in order to stabilise the region's research potential and contribute to sustainable research development.

Russia and the New Independent States research aims are to increase research potential, tackle problems of mutual interest, strengthen coordination, and complementarity with TACIS and other programme instruments and support to INTAS. In addition, specific Calls in this sector include Environmental Protection, Industrial Production and Communication, and Health Protection.

The multilateral coordination aspect of the INCO programme involving strengthening of coordination with other foreign policy instruments and definition of research priorities aims to support Community development policy and external relations, strengthen coordination with other Community foreign policy instruments (MEDA, TACIS, EDF, ALA) and support efforts of the Community and Member States to opening up ERA to the world. Particular priorities are defined. Here S&T Agreements and their *ex ante* and *ex post* assessment are relevant.

Again it is clear in FP6 how diverse the geographical and scientific interests of the INCO programme are. This is both a strength and a weakness. Once more the initial demarcations for targeting of activities are geographical, but there is apparently a greater thrust towards satisfying overall Community policy aims and those of Member States, so that the origin of the FP6 INCO approach is not as individualistic as that of FP5 as policy dialogue with other bodies is an increasingly important feature. The question is how successful this alignment is and what the particular niche or thrust for INCO is to be seen as – and whether this is valid. The concern with the present research programme positioning is that it is too diverse and ambitious within the

[15] See Integrating and Strengthening the European Research Area – Specific Measures in Support of International cooperation (INCO) 2004 Work Programme: Section B3, which relates to Health

context of the funding available to deliver robust impact on the needs and geographical sectors identified. A question is how much of it might anyway be viewed as properly within the ambit of the Thematic Programmes and how effective the interface is with these. It should nevertheless be taken into account that it was INCO rather than the Thematic Programmes which played a proactive role in providing assistance to former Candidate Countries in promoting their fuller participation in the FP prior to becoming Member States.

3. INCO ACTIVITIES, RESULTS AND IMPACTS

This section provides a descriptive analysis of the INCO Programme as implemented under the 5th Framework Programme and draws out strengths and weaknesses of the INCO approach to international science and technology cooperation in comparison to its stated objectives:

- to promote RTD co-operation internationally to reinforce Community capacities in the fields of science and technology;
- to generally support the achievement of scientific excellence within the wider international framework;
- to contribute to the implementation of the Community's external policy also with the accession of new members in mind.

Whilst activities and results refer specifically to INCO under the 5th Framework Programme, impacts relate to INCO to date, which reflects the difficulty in deciphering where the impacts from each programme start and finish.

3.1 THE STRUCTURE OF THE INCO 2 PROGRAMME

3.1.1 THE THEMATIC SUB-PROGRAMMES

At a first glance, INCO 2 appeared to be a multi-targeted patchwork, with loosely connected thematic sub-programmes, which used a variety of funding instruments to provide support (see below). The programme was organised according to seven sub-programmes, which combined a targeting of the research needs of different global regions and support for horizontal research actions, as described below.

1. Co-ordination (COORD): comprised grants for scientific missions abroad and the organisation of workshops. All of these grants were 'Kitzmantel Grants' (see below) and were related to 'COST' actions.

2. Emerging economies and industrialised countries (EM.ECO): Despite its title, this sub-programme was also only devoted to the funding of seminars and workshops. Moreover, with one exception (a study of malaria), China was the sole country which appeared clearly as an 'emerging economy'.

3. Mediterranean partner countries (MED): a strong focus on R&D cooperation between EU and the Mediterranean countries appeared clearly in this sub-programme. Trans-boundary economic, environmental and socio-political problems were issues of specific importance in this context.

4. NIS + CEEC countries not in the pre-accession phase (NIS + CEEC): As with the Mediterranean partner countries, the projects in this sub-programme were clearly related to regional needs. Of particular interest were the solution of regional problems linked to the environment and to health, and of structural

problems of transition and socio-economic development, and sustainable use of natural resources; as well as the consolidation of the scientific and technological potential in fields where these countries had a recognised excellence and valuable co-operation potential. Socio-economic research aspects –such as social welfare, including employment, and stabilisation of local institutions– were to be integrated wherever appropriate.

5. Research for development (RES.DEV): As its title indicates, this sub-programme had a large spectrum of projects, which responded to the RTD priorities and socio-economic requirements of Developing Countries. These were identified as a result of a fluent dialogue between Community scientists and groups of countries and regions. The main objectives of this sub-programme were to tackle challenges faced by Developing Countries, to mobilise the European S&T community jointly with Developing Country research teams and to use RTD co-operation to support Community development co-operation policy.
6. States in the pre-accession phase (STAT.PREAC): This sub-programme supported workshops and missions, but its main focus was the creation and development of research centres for regional development. Activities which promoted links with economic and social actors, and which aimed at opening opportunities which would not be available with the budget the centres would normally receive, were particularly supported.

7. Training of researchers (TRAIN.RES): This sub-programme supported fellowships for internships in the EU for scientists from developing countries, including Mediterranean and emerging economy countries, as well as internships for EU scientists to work in industrially-oriented laboratories of the highest quality in non-Union countries in areas of particular interest to the Community.

3.1.2 THE FUNDING INSTRUMENTS

Within each of the seven existing sub-programmes, a range of EU research funding instruments were applied to support different actions, as described in detail below.

1. Classic Accompanying Measures: Different types of actions were brought together under this name: implementation of new studies, impact studies, creation or development of research centres, coordination, promotion of cooperation, seminars, networking initiatives, etc. The objective of these measures was to contribute to the implementation of the specific programmes or the preparation of future activities, with a view to enable them to achieve their strategic objectives; and to prepare for or to support other indirect RTD/RTDT activities.
2. Kitzmantel Grants: These grants supported seminars and short-term missions (there appears to be some overlap with the previous category).
3. Concerted Actions: This category supported the creation and development of research networks on well identified R&D subjects of practical and immediate interest (e.g. health, sustainability). Designed to co-ordinate RTD projects already in receipt of national funding, in order to exchange experience acquired;

to expand the research efforts of the various players so as to reach a critical mass; to disseminate results and to inform users.

4. Research Projects: This title is self-explanatory and does not require additional comment.
5. Thematic Networks: This category is very close to 'concerted actions'; if there is any difference, it is in the stronger involvement of governmental bodies. Designed to facilitate co-ordination of activities and transfer of knowledge around a given scientific and technological objective between, for instance, manufacturers, users, universities, research centres, organisations and research infrastructures. This coordination activity includes the creation of networks between projects financed by the Community or by the Community and at national level.
6. Fellowships: Two types of fellowships operated under INCO 2: individual fellowships for young researchers from developing countries; and outgoing fellowships to Japan for young researchers from the European Community.

A first overall analysis of the objectives and shape of INCO 2 without taking into account the actual impacts that it managed to achieve suggests a number of potential strengths and weaknesses. These are highlighted in the table below

Apparent Strengths of the INCO 2 Approach	**Apparent Weaknesses to the INCO 2 Approach**
• INCO 2 was an ambitious programme. It comprised 3 major topics –environment sustainability and health– which were implemented in 5 different sets of countries: Emerging economies and industrialised countries, Mediterranean partner countries, NIS + CEEC countries not in the pre-accession phase, States in the pre-accession phase and developing countries. • INCO pioneered third country involvement in the Framework Programmes and initiated the development of DG RTD institutional memory which could support later opening up of the FPs. • INCO gave third countries the opportunity to participate in the Framework Programmes with funding, before the FP opened to third countries under FP6. At the same time, INCO allowed EU partners to work on an equal basis with third country partners. • INCO provided an important facility to support research for development that was not covered elsewhere within the Framework Programmes.	• Because of its derivation, the INCO programme seemed to lack scientific coherence or a sense of mission other than to foster international cooperation in S&T. • The funding allocated to INCO 2 proved to be too small to satisfy the ambitions and needs of the programme. • Sufficient account did not appear to be taken that the needs, locations and the available higher education and research infrastructure within the 'developing countries' –covering about half of the World– are very different to those in other global regions.

These strengths and weaknesses were tested in a series of in-depth interviews held with internal Commission and external stakeholders, as well as via an on-line survey.

3.2. INCO 2 OUTPUTS AND RESULTS

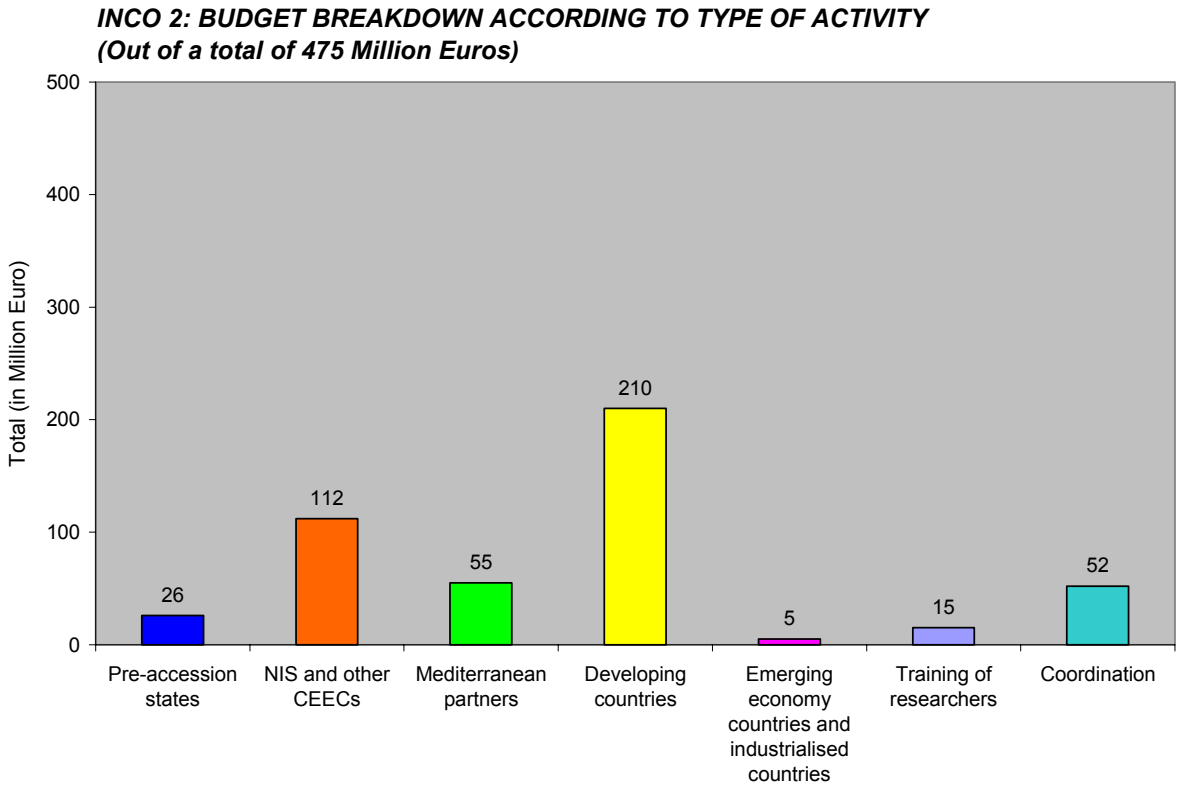
The below analysis is made from the data provided by DG Research. This section aims to give an overview of how the INCO 2 budget was actually allocated, but does not yet comment on the impact of this funding, which is discussed in the next section.

3.2.1 INCO 2: AN OVERVIEW

The INCO 2 Programme was a relatively small funding programme both by Framework Programme Standards and by Member State standards. The total EU budget for INCO 2 was 475 million euros, which represented circa 2.5% of the total Fifth Framework Programme budget administered by DG Research, and only 0.1% of the budget allocated by Member States' (EU 15) to research. To gain a sense of scope it is interesting to note the INCO 2 budget with allocations to other FP5 programmes such as the largest thematic programme User-friendly Information Society which was allocated 3600 million euros and the largest horizontal programme Training and Mobility of Researchers, which received 858 million euros. It should be noted that 70 million euros of the INCO budget were allocated to INTAS.

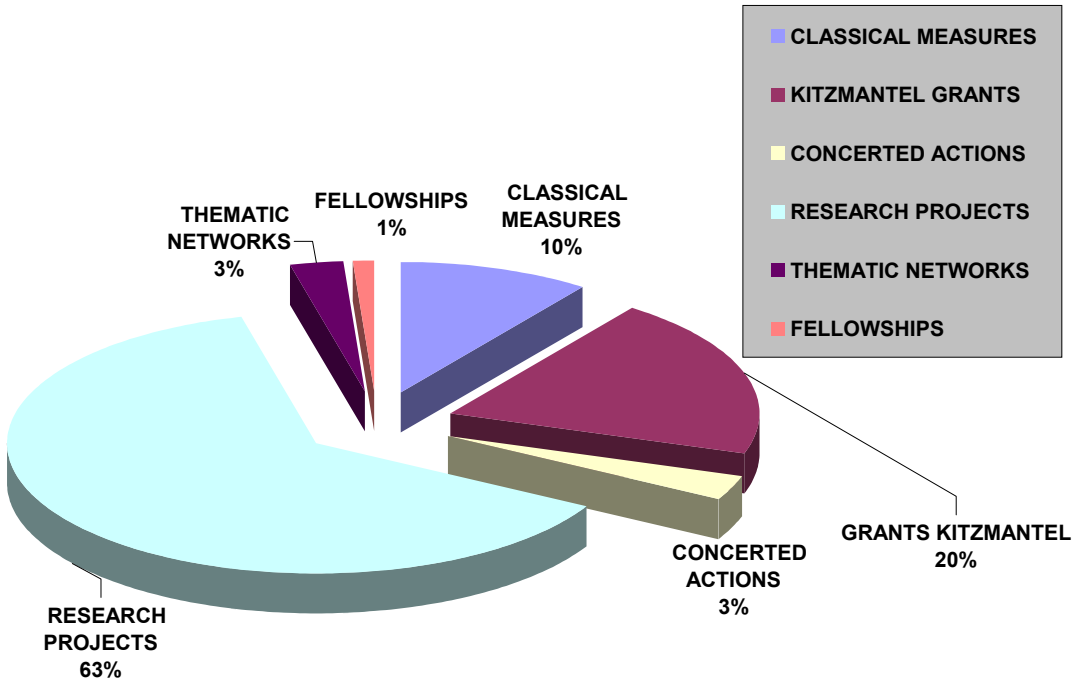
INCO 2 activities were supported under the heading 'Confirming the International Role of Community Research' comprising the 7 sub-programmes described earlier. Before considering in-detail the projects supported within these sub-programmes, it is interesting to measure their relative importance within INCO 2.

Figure 1 – Breakdown of INCO Funding by Sub-programme



With such a small budget, the strategic choices were not clear-cut: either distributing the money; complementing other programmes or organisations; or focusing on a very limited number of topics. The first two options had the disadvantage of poor visibility.
Figure 2 shows the distribution of the budget according to different funding instruments.

FIGURE 2 – INCO 2 Contribution by Funding Instrument



As mentioned above, the differences between classic Accompanying Measures and 'Kitzmantel Grants' did not appear to be particularly significant; they financed mostly workshops, assessments, publicity and missions. Therefore, about 30% of the total budget was employed for these purposes. Research projects were assigned to almost two thirds of the budget (63%), whilst concerted actions, thematic networks and fellowships received a small portion –less than 10%– of the financial resources.

3.2.2 INCO 2: ANALYSIS BY SUB-PROGRAMME

It should be noted that the breakdown of funds and contracts described below relates to raw data provided by the European Commission DG Research to the evaluation team. In some cases, there may be small inaccuracies in the figures provided.

1. Coordination

The total INCO 2 contribution to this sub-programme was about 6 M€ to support workshops and short missions through 'Grants Kitzmantel'. In total, 27 countries, that is to say the 15 EU Member States (at that time), Associated States (Switzerland, Iceland

and Norway), in addition to 9 Pre-accession States were involved. However, it is important to note that the largest part of the budget was allocated to EU countries, with one exception, Norway, which coordinated a project on 'European malaria vaccine initiative' (EU contribution: 700 000 €). The average EU contribution/project was about 12500 €.

2. Emerging Economies and Industrialised Countries

This sub-programme concerned only 25 projects (2% of the total number of projects) which were all funded through 'classic Accompanying Measures' and 'Kitzmantel Grants'. Twelve countries were involved: 9 from the EU, as well as Australia, China, Israel and Tanzania. There was also a contract with Canada but this did not include any budgetary costs for the EU. More than 80% of the 'total eligible costs' were awarded to a project coordinated by Belgian partners, *'Multipurpose vision inspection system for plastic bottle pre-forms*', in cooperation with France and without any EU contribution; it is therefore unclear why this project appeared in INCO. Most of the projects that were supported by this sub-programme were seminars and workshops. Non-EU countries and particularly 'emerging economies' were poorly represented. Furthermore, there did not appear to be a distinct difference between the support provided by this sub-programme and that provided under the 'Coordination' sub-programme.

3. Mediterranean Partner Countries

This sub-programme was really targeted towards Mediterranean countries. Besides the 25 EU Member States, Algeria, Egypt, Croatia, Israel, Jordan, Lebanon, Morocco, Palestine, Syria, Tunisia and Turkey shared the 645 contracts for 93 projects. The EU contribution benefited primarily 3 EU Mediterranean countries: France, Spain and Italy (about 30% of the total); followed by Tunisia, Morocco, Egypt, Jordan and Turkey which shared another 30% (see Figure 5). As would perhaps be expected, a large number of projects that received funding concerned Water (42 out of the total 93 projects); in addition the other supported projects concerned Culture and Archaeology with 19 projects, Public Policy (including Transport) with 14, Health with 9, Agriculture with 5 and Technology with 4. There was a fairly wide spread of thematic areas.

4. NIS + CEEC Countries not in a Pre-accession Phase

This was the second largest sub-programme of INCO 2, both in relation to the amount of INCO contribution (112 M€ for 123 projects) and according to the number of countries having obtained a contract (47, including the 15 EU Member States). The projects were largely dedicated to Environment and Sustainable Development, essentially for Water Treatment (42 Research Projects, 10 'Kitzmantel Grants' and 3 classic Accompanying Measures). The second major topic was Policy, i.e. mainly networking and workshops for participation in FP5 (28 projects). Health had 14 projects, with the majority concerning the effects of radiation. Technology and Basic Science had fewer than 10 projects each.

5. Research for Development

This was the largest INCO 2 sub-programme, with about 200 M€ to fund 316 projects shared by a large number of countries (109 in total), including again, the 15 EU countries and also 3 Mediterranean countries: Egypt, Morocco and Tunisia. An analysis of this sub-programme is not easy because some topics were very specific to certain parts of the World (e.g. South America, Central Africa and South East Asia). Most of the projects, 33/68 of the classic Accompanying Measures and 110 of the 201 research projects, concerned Agriculture (including Forestry, Cattle breeding, Fisheries and corresponding Information Society Technologies); Health, with 47 research projects ranked second.

In comparison with the NIS + CEEC sub-programmes, and according to the number of countries concerned, it seems that a much smaller effort was made in terms of forming networks in FP5. In the Agriculture field, many projects had an 'industrial' focus, i.e. export crops, like coffee, cotton, teak and fish. There were either none or very few projects in education, culture, improvement of local higher education and S&T. Due to the needs of the different parts of the World, in terms of EU interests, this sub-programme could have been more efficient had it been better structured. For example, the sub-programme could have been separated into 3 parts: South America, East Asia and Africa with a supervisory committee in charge of networking projects of global interest (for example malaria and tuberculosis studies).

6. States in the Pre-accession Phase

In comparison with the 3 previous sub-programmes presented above, this sub-programme was a minor one, with an INCO contribution of only about 26 M€ for 121 projects shared by 25 countries. However, it had only 2 purposes, through classic Accompanying Measures and 'Kitzmantel Grants': promoting FP5 and their results through conferences and workshops and improving R&D in countries in a state of pre-accession by creation and/or the support of centres of excellence. Interestingly enough, this is the first sub-programme where EU countries did not appear to be main stakeholders.

7. Training of Researchers

The goal of this sub-programme was clear. Fifty-two contracts were allocated to 19 countries for the training of young scientists from developing countries; another 27 contracts were for visiting EU scientists to Japan. Nevertheless, the total amount of INCO contribution was rather small if the real needs of the training of young researchers from developing countries had been fully taken in account. On the other hand, there was a big difference for the cost of a fellowship project between the 2 categories: 21 050 € for young researchers from developing countries; 118 724 € for outgoing scientists to Japan. It is noticed that Belgium and Netherlands were the major participants in this activities.

3.2.3 INCO 2: ANALYSIS OF RESULTS

When comparing the numbers for the different sub-programmes implemented under INCO 2, the following conclusions can be drawn:

- There were three sub-programmes –Coordination, Emerging economies and Training of researchers– with particularly minimal budgets. Each of these sub-programmes received only about 1% of the total funding for INCO.

- Consideration of the projects awarded under the Emerging Economies and Industrialised Countries (EM. ECO) programme raises questions as to why the real emerging economy projects were poorly represented in this sub-programme, which in turn was also poorly funded. Nine of the 12 countries involved were EU Member States, making the emerging economy dimension particularly weak. The major part of the projects in this sub-programme could have been integrated into other parts of INCO 2.

- Whilst it may have been expected that the Training of Researchers sub-programme would form the backbone of the INCO programme; this was not the case in INCO 2. INCO 2 only supported 52 fellowships of researchers from developing countries during its four year life span. It should be noted that the available data did not allow an indication as to whether the Research for Development (RES.DEV) sub-programme or other FP programmes contained grants for the training of young researchers.

- The Mediterranean Partner Countries (MED) sub-programme had a budget of about 50 M€ and concerned, besides the Member States, 14 countries closely connected to the EU both for geographical and historical reasons. This is probably the reason why this was the only INCO sub-programme supporting projects on culture and archaeology (about 20% of the total number of projects). As would be expected, the majority of the projects were in the field of water management which is also important for southern EU Member States. This may explain why this sub-programme had the 2nd largest funding allocation for 'thematic networks' (although this was only for an amount of about 4.5 M€).

- The Newly Independent States (NIS) + Central and Eastern European Countries (CEEC) sub-programme appeared to be fairly well-balanced. However, the interactions between this sub-programme and International Association for the Promotion of Cooperation with the Scientists of the NIS (INTAS) (63% of the total EU contribution) were not fully clarified. As a consequence, the funding per country was small: Slovakia received only 50,000€.

- RES. DEV. was the most important sub-programme in absolute value, although more than 100 countries were involved. At the time of writing it was difficult to compare and to discuss the potential impact of this sub-programme because of the diversity of the countries, the subjects of the projects and the local priorities involved.

- In synthesis, on a total amount of about 400 M€, only 260 M€ (65%) were invested in 'research projects', 14 M€ (3.5%) in 'concerted actions', 12 M€ (3%) in 'thematic networks', and 4 M€ (1%) in fellowships.

3.3. THE IMPACT OF INCO ACTIVITIES

3.3.1 OVERVIEW

Analysis of the international science and technology cooperation policy environment over time and consideration the size and scope of INCO 2 with its seven sub-programmes leads to questions with regard to what the activity actually managed to achieve and to what extent it was possible to meet the stated aims and objectives of the programme. The analysis of impact of such a diverse programme is a challenging task, and the timing of the analysis, when the discussion on Framework Programme 7 was already on the table, highlighted the need to put insights into impact and the value of the INCO into its present context. This context was clearly wider than the DG Research brief and concerned other Directorates General, which have responsibilities for relations with third countries. In this way impacts were taken into account in the discussion of the future of international cooperation, which is discussed in the next chapter.

Sample points were selected for the discussion and gathering of evidence on impact and potential impact. This provided first-hand valuable insights into reported and potential impacts even though it was not feasible to provide full coverage of all programme areas and projects. INCO was considered as a continuous process of international science and technology cooperation over several Framework Programmes rather than by measuring project-level impacts. The key elements described in this section reflect the outcomes and analysis of a programme of in-depth structured interviews with representatives from DG Research, DG External Relations, DG Development and DG Environment, those representing international scientific and development organisations both inside and outside the EU. To broaden the sample points and provide quantitative data a wide-scale detailed survey was launched via the European Commission's EUROPA web site, which attracted over 350 responses, one third from third countries and respondents representing over 50 nationalities.

Impacts were considered within the structure of the past and potential impacts upon the present and future value of international science and technology cooperation, as follows:

- **The past value of the INCO Programme**: including its role and value from the point of view of science and policy; its strengths and weaknesses; its interface in relation to other programmes and activities; its commitment and impact; and its evolution.

- **INCO's current position**: including its particular features; its added value; the effects of the changes that took place over the past years; and its actual formulation and structure.

- **The future role and value of INCO**: including views on potential changes to the nature of the programme; the opinion on the INCO brand; the opportunities to play a more active role; its distinctiveness in comparison to FP thematic programmes; and future alternative positioning.

3.3.2 REPORTED IMPACTS

Key targeted stakeholders are strongly inclined to value the INCO Programme in terms of the aggregated and visible benefits derived from it. Cooperation and reinforcement of relations between participant countries have proved to be more credible goals than ambitious objectives to solve societal problems and create wider socio-economic impacts in partner regions, or to increase the individual recognition of researchers. In general, it is considered that the main achievements of the INCO programme have been focused on **strengthening relations and building scientific partnerships** between the EU and third countries, and on improving capacities in partner countries. More ambitious objectives are considered to be potentially achievable in the longer term if a series of conditions were put into practice (i.e. simpler rules and procedures, more funding, more information and communication initiatives, better integration of partners in third countries, etc.)

The **legacy and the institutional memory** of INCO are some of the most important assets to be built upon. However, within DG RTD there appears to have been insufficient pooling of knowledge and experience resulting in other areas of the Framework Programme not sufficiently benefiting from in-house third country experience. Furthermore, there is a lack of structured coordination between international S&T aspects of DG RTD and the other Directorates General with third country responsibilities. Past interactions between INCO and for example DG RELEX or DEV have depended upon personal contacts. There has also been a lack of coordination with Member State organisations responsible for international science and technology cooperation.

The political dialogue and the third country perspective that have characterised the INCO Programme in the past provided INCO with a profile of its own. INCO is considered at present a **small but valuable brand** that people recognise. It can be considered that a degree of brand awareness has been successfully created. The shared view is that the INCO programme did not necessarily make it easier to be involved in the thematic programmes but the experience gained meant that third and some developing countries had established networks that worked and experience which helped them to be involved in the 6th Framework Programme.

The **need for a specific EU-Third Country research programme is supported** by the majority of stakeholders involved in INCO, as the thematic programmes are perceived to have a strong focus in Europe and consequently do not provide the special conditions that researchers in third countries require in order to be able to participate in research projects. A specific programme such as INCO has the advantage of focusing on the needs and conditions of developing countries. Furthermore, the provision of a forum such as INCO where under-researched and global issues of concern to all could be addressed is considered to be a positive impact that should be maintained.

From the perspective of third countries, the **development of relationships** with neighbours, as well as with developing countries in other regions, and with smaller EU countries –particularly new Member States– was highlighted among the most significant impacts of the programme. Conversely to some earlier expectations, the emergence of cutting-edge research opportunities that INCO and now the thematic programmes were providing in developing countries, in some cases, allowed top third country researchers to remain in their countries, reducing the effects of brain drain.

There is slightly less consensus when evaluating the research benefits of INCO for European researchers, though this feature is not perceived among the main priorities of the programme. Another point to be highlighted is that simplicity and accessibility of information are not considered to be INCO strengths. The shared view is that third country researchers in particular found it very hard to get familiar with the **administrative logic of the programme**, in particular the payment regimes and requirements.

With respect to INCO's current position, key changes highlighted included the need to work on the **communication of the benefits that the programme offers** to different stakeholders. Greater efforts could have been made to give third country participants a sense of ownership and visibility through the programme and to strengthen links to past editions of the programme. The specific objectives of the programme as well as its strategic impact in terms of scientific international cooperation need to be given more publicity. The programme itself should enjoy **stronger visibility** among strategic target groups. Information and coordination channels, as well as networks, should be strengthened to take advantage of the different opportunities that might arise.

Various lines of action would be favoured in order to enhance cooperation between the EU and third countries and achieve the highest possible impact. There is a need for **greater flexibility** for financial and administrative aspects for partner country researchers, better planning and the implementation of long term actions to strengthen cooperation and links, and additional efforts to disseminate information and results – not only among researchers, but among other key stakeholders and the general public as well– are among the main priorities indicated by participants of the programme.

The evolvement towards a more **bottom-up structure**, with a stronger participation and voice of third countries, is highlighted by some as a necessary move. This is considered to be particularly important for third countries with which greater discussion on establishing priorities for development could be explored by INCO to build agenda setting mechanisms driven by a bottom up process.

More ambitious propositions beyond the immediate scope of the research community – including assistance for societal and economic problems in third countries, improved relations between EU and non-EU policy makers and identifying trade opportunities between Europe and partner countries– are not broadly supported by key stakeholders as they are considered less achievable. The driving force appears to be that the achievement of **realistic goals in the short and medium terms** can provide a solid base to lead to more ambitious objectives in the long term.

3.3.3 STRENGTHS AND WEAKNESSES OF THE INCO APPROACH

The programme clearly recognised wider EU policy concerns. It had a **maturing basis in policy dialogue with third countries** increasingly foreseen over a longer term timescale embracing coordination roles with MS and more widely with international bodies; it aimed to stimulate international competitiveness and socio-economic development while recognising the risks of globalisation; it aimed to responded to identified needs at various levels yet takes account of global political commitments by the EU such as Millennium Development Goals; it supported global sustainable development including environmental health and food security and recognises Europe's own sustainable development strategy.

Even more pragmatically it provided European access to local knowledge and usability in a range of different situations and aims to achieve benefits for Europe, other industrialised countries, developing, and emerging and transition economies. There is a shared view that scientific research in Europe should remain open to needs outside Europe as **science is necessarily international**. European scientific prestige will be subject among other things to Europe's capacity to face and solve problems beyond its frontiers. In this line, addressing under-researched and global issues that are of concern to all should remain an important priority of the INCO programme.

The outcome of this varied remit however, is that INCO appeared as a somewhat disjointed research programme, as it embraced different aspects of science, which on first analysis did not seem to be logically connected. It was almost a mini-FP in its own right. From a scientific standpoint it is not really sufficient to be seen to be fulfilling a remit of filling gaps left by other programmes in the FP or formulating scientific priorities initially on the basis of geo-political priorities. Consequently INCO appeared to have no **coherent scientific mission** other than to cooperate internationally. Although would dispute that this is good for science, it does not constitute an S&T activity in its own right. **INCO needed to have a niche that has a scientific basis** to justify its place in the FP and an "essence" that was clear and credible for the scientific community without losing the international standing and policy relevance that had been achieved. The question then is what form this should take. Various ideas relating to any future positioning of the INCO programme are explored later in this document.

INCO needed to achieve a better grip on the coordination activities that already feature in its work programmes. The Lisbon objectives and the ERA policy aims give every justification to this in the context of S&T cooperation policy. Such coordination involves initiatives relating to MS assisting the EU (as a major international funder) having an influential voice in international fora, liaising with wider European institutions, with international bodies, and within the FP itself. Clearly defined actions are needed rather than aspirations so that real "platforms" of communication and implementation are achieved that involve all stakeholders and have genuine influence and achieve tangible outcomes.

Consolidating the achievements of the past –through a stronger focus on communication and information actions– and strengthening the links with the different stakeholders involved –through a decisive coordination role –will certainly demand big efforts, but will help project long-term horizons for the INCO programme.

4. OTHER APPROACHES TO INTERNATIONAL S&T COOPERATION

4.1 OVERVIEW

The purpose of this section is to highlight the strategic approach adopted by a sample of other organisations and countries involved in international S&T cooperation. Four countries[16] were selected for this comparative assessment: Australia, Canada, South Africa and the USA, and two organisations: the UK Department for International Development (DFID) and the European Science Foundation (ESF), which was made on the basis of research of data available on the Internet. It should be noted that there may be specific aspects reported below that are not currently up to date. The purpose here was simply to take a sample to see whether any generic lessons could be learned. The examples chosen are not intended to reflect any particular coherences or comparability of international S&T cooperation. Resources were not available in the study to survey different countries or organisations from such a standpoint.

The rationale behind this selection was to open the discussion on possible approaches for the INCO Programme, by considering strategies pursued elsewhere. It should be noted that China was not taken into account as the EU-China Science and Technology Agreement had been the subject of a recent study carried out by some of the evaluation team members. Japan was also not taken into account, as it was considered that the approach taken might be comparable to that adopted by Australia. The next stage of the project will be to validate the findings outlined below with various stakeholders.

4.2 ORGANISATION OF S&T POLICY

Science and Technology policy is linked to governmental bodies in all the countries selected, acting as an advisory arm to shape foreign policy: in Canada, the Advisory Council on Science and Technology (ACST), provides advice and guidance to the government on S&T issues; in South Africa, S&T policy falls under the auspices of the Department of Arts, Culture, Science and Technology (DACST); the Australia Research Council (ARC) has its activities approved by the Ministry of Education, Science and Training and in the USA, the Department of State is responsible for assuring that S&T considerations are taken into account and integrated into USA foreign policy.

4.3 KEY PRIORITIES

The analysis of S&T policy in all the countries indicated a strong emphasis on promoting investment in innovative research projects, in order to strengthen both national business and trade. Furthermore, international S&T cooperation was seen as

[16] It should be noted that this analysis is mainly drawn from desk research of material on the Internet and should not be considered as information provided by the organisations and countries mentioned. Therefore, there may be inaccuracies or misinterpretations in the information provided.

a vehicle for increasing renown on an international level. Whereas national projects are centred on building up internal infrastructures, robust training schemes and creating an information society, as evident in Australia and South Africa, international activities tend to be based on promoting S&T international relations in scientific research, with the aim of strengthening the countries' positions as competitive global players.

The forefront of activities in all the countries appears to be focused on large-scale research projects, based on international scenarios and often with an industrial and business thrust. In Canada, the governmental organisation, International Trade Canada (ITCan) has an international business dimension aimed at increasing access of business and research organisations to international R&D opportunities, as a means of shaping foreign policy and promoting Canada as an innovative S&T based country. Therefore, ITCan supports entrepreneurial technology firms to access venture capital sources in targeted overseas markets, as well as organising international missions for Canadian researchers and technology firms to explore innovative approaches on an international scale.

Similarly, the Australian Government encourages industry access to new technology through the support of international research collaboration at local, bilateral and multilateral levels. International research collaboration is encouraged through the funding of innovative research concepts, in order to advance Australia's research excellence and allow Australia to be globally competitive. The International Science Linkages funding mechanism aims to achieve this by assisting Australian researchers to increase their participation in international leading scientific research and to strengthen Australia's capacity to attract overseas R&D investment and promote innovation, thereby increasing the economical and social impact of research. The Forum for European-Australian Science and Technology (FEAST), in which scientific links between European nations and Australia are promoted, is also an example of a productive scientific collaboration between Australia and other nations.

In the USA, the economy is heavily reliant on new technologies which are the product of scientific activity. For this reason, there is a strong focus on robust international S&T cooperation in order to keep researchers at the forefront of innovation. S&T cooperation is therefore organised through providing access for USA scientists to foreign research facilities, knowledge and scientific developments. This type of research cooperation ensures that USA technologies derived from scientific research are on the cutting edge of relevance to world markets, which in turn enhances USA economic prosperity.

The approach adopted towards S&T in South Africa is similar to the other countries. However, action is slower moving due to the country's political background. The relatively recent policy introduced in the mid-1990's has broadened the scope of S&T to focus on innovation based on the framework of a National System of Innovation. The aim is to use this as an enabling mechanism to position South Africa on a competitive front on the global economic scale, through increased funding to finance larger scale innovative projects across various sectors: education, government, civil society and industry.

4.4 TOOLS

The various tools and mechanisms by which these key priorities are delivered are at the heart of S&T international collaborative operations in all the countries and organisations.

The main tool through which international collaborative research is facilitated is through agreements and arrangements with other countries. These strategic alliances with other countries form an integral part of S&T strategy in the countries and organisations explored. Australia, South Africa, Canada and the USA are all signatory to a significant number of S&T arrangements, incorporating both bi-lateral as well as multi-lateral agreements, with the aim of allowing scientists and research institutions to collaborate on a wide variety of scientific endeavours and research programmes. In the USA, these international arrangements are integral to S&T policy, allowing scientists access to foreign research facilities, knowledge and scientific developments, as well as enabling scientific delegations to participate in joint S&T networks, forums, meetings, conferences and workshops. Increased importance is continually being placed on funding schemes in all the countries, which allow scientists access to internationally focused scientific research programmes and support international exchanges of research personnel, training opportunities and career development through supporting participants to undertake missions, scholarships, fellowships, internships in different countries. For example, as part of the Competitive Grants Funding Scheme in Australia, support is provided on a competitive basis for Australian researchers to participate in strategically focused, leading edge, international scientific research and technology collaborations.

Canada, South Africa and Australia place a strong emphasis on relations with the USA and all have established a strategic cooperative alliance with the country. Japan is also seen as a key player in international S&T relations and has entered into agreements with the countries analysed (excluding South Africa)-Japan is also an initial major funder of the international Human Frontiers Science Programme based in Strasbourg. Canada and Australia also place a strategic importance on relations with France.

4.5 MOBILITY

One of the specific strategic objectives of the European Science Foundation (ESF) is to promote the mobility of researchers and the free flow of information and ideas as a means of enhancing European research cooperative initiatives and fostering scientific collaboration in Europe. Although the ESF has a mainly European focus, it still welcomes the involvement of scientists from other parts of the world and frequently proposes collaboration between European scientists and their American colleagues. This may occur in a more formal setting between ESF and the USA National Science Foundation (NSF), through special joint workshops. Alternatively, as it is often the case, American researchers are proposed informally as individual active members of European Science initiatives.

For example, as described in the section above, formal and informal agreements and arrangements are also entered into by the countries, which enable a flexible exchange of innovative research initiatives across political borders.

As part of the Canadian international S&T programme, the Department of Foreign Affairs and International Trade manages the 'Going Global Fund', which assists Canadian researchers to establish new international collaborative ventures with foreign partners. In the USA, a transatlantic mobility facilitated by a series of international cooperation agreements, allows USA scientific and research institutes to collaborate on a wide range of scientific endeavours and to initiate new joint ventures. The EU-USA S&T agreement aims to improve transatlantic cooperation in this respect, by creating a bridge on both sides of the Atlantic, in order to facilitate international scientific collaboration.

In South Africa, official S&T cooperation with the EU signed in 1996, allows a cross-exchange of research personnel and submissions on collaborative ventures by South African scientists were accepted by the EC's Fourth and Fifth Framework Programmes. Similarly, Canada's agreement with the EU entered into force in the same year, paves the way for Canadians and Europeans to participate in one another's research programmes. Cooperation occurs on a self-funded basis (where Canadians are supported by Canadians funds and Europeans through European programmes). Cooperation is subject to the availability of funds and to the applicable laws, regulations, policies, and programs of Canada and the EU Community.

Other instruments employed to promote mobility in the field of international science policy are evident in the organisation and support for workshops, fellowships and grants for PhD and post-doctorate students, positions for scientific researchers and invitations to participate in foreign missions, work placements, training courses and international conferences.

4.6 PARTNERSHIP AND NETWORK BUILDING

The most active example of partnership building is in DFID, where strengthening these ties is the core principle underlying the organisation's activities. DFID works in collaboration with a range of partners, including governments, civil society and the private sector, as well as with multilateral institutions including the World Bank, the United Nations agencies and the EC, in addition to working directly in over 150 countries worldwide with over half of its 2500 staff working overseas. DFID also funds a variety of training schemes and scholarships aimed at post-graduates, students in higher education and professionals, which support science and technology initiatives through promoting and strengthening collaborative networks with the UK and the developing world. This type of partnership building is in line with DFID's remit, which as part of the UK government, is very much to target developing countries, making it different in emphasis from the examples provided in the above sections.

In addition to the emphasis on partnership building across international borders described above, there is also a focus on strengthening networks with key stakeholders across various sectors. For example, the USA Embassy Science Fellows Program, offers USA embassies the opportunity to host a working scientist for one to three month stay, representing a successful example of an active long-term partnership between the S&T community in government, academia and the private sector. In Australia, the Linkage Programme and the Centres Programme under the Australian Research Council (ARC) are funding mechanisms which help to broker and

strengthen partnerships and networks between researchers and industry, government and community organisations, as well as the international community.

4.7 FUTURE VISION

The countries and organisations consider both medium and long-term project aims as part of their future developments and vision. The ESF Forward Looks instrument for example, is a tool used to develop future planning and enables Europe's scientific community to collaborate on longer-term research activities based around specific scientific themes. These programmes promote high-quality research and effective cooperation among scientists from across Europe and beyond.

Australia, Canada, the USA and South Africa position their long-term future vision as increasing their competitiveness on the international S&T front, in order to be seen as world leaders in the field of S&T research. The strategy for achieving this goal is to improve collaborations with partners and networks and invest more funding into international collaborative research schemes. All four countries identify their future aims as enhancing cooperation and commitment with international partners in academia, the private industry sector and the government, in order to position themselves at the forefront of longer-term, larger innovative research projects of an international dimension.

5 PERSPECTIVES FOR THE FUTURE

5.1 INTRODUCTION

To most scientists involved in research cooperating with others internationally is something that comes naturally. It is an intrinsic component of much scientific work rather than a skill or competence that is identifiable specifically. As discussed in the course of this study a positioning for a research programme that is solely dependent on international cooperation as its *raison d'être* does not provide it with sufficient differentiation for its purpose to be immediately obvious. There has to be more to it than that.

Ironically for the stance of INCO the position was made worse when the Framework Programme (in FP6) was made open to the world thereby increasing its potential international dimension overall. A programme component that identified primarily with international cooperation like INCO therefore lost even more of its differentiation as one tried to identify and communicate what it did that the over-arching Framework Programme could not also do.

Certainly there are answers to this dilemma but they are not always so easy to communicate globally or identify with whether as a provider or a beneficiary. The concept of the early STD1-3 programmes was a much easier one to understand. Here was an effort to provide science and technology to assist development. But the subsequent derivation of INCO from these and ISC provided a much wider programme backcloth in which it has been increasingly difficult to see coherence or communicate a unique differentiation especially since FP6 when third country funding was potentially available to all. At least in FP4 and FP5 one could differentiate INCO from a pragmatic standpoint because it potentially could provide 100% funding to third countries whereas other FP thematic programmes could not.

So now it becomes even more important to differentiate INCO within the Framework Programme as a whole and understand and spell out the difference between international cooperation as it is understood throughout the scientific world and what it is that a targeted programme such as INCO with the title of International Cooperation actually contributes that is different from this broader understanding.

The Inception Report of this study indicated some ideas that might be developed for achieving this: for example to provide the intellectual "glue" needed to bring together the various policy aims of international cooperative S&T through various means (for example: coordination, research into needs, pilot or seed-corn projects, provision of platforms of stakeholders, studies of take-up constraints) and to support their execution "on the ground" so that the science demonstrates tangible impacts. But further consideration of such ideas must now be done in the context of the Proposal for a Decision on FP7 published in April this year some months after the present study had started. That is the basis for the analysis presented below.

5.2 INCO AS A RESEARCH PROGRAMME IN FP7

FP7 as proposed is divided into four specific programmes corresponding to four major objectives of European research policy. These are ***Cooperation, Ideas, People*** and ***Capacities.*** In particular, theme-oriented international cooperation actions are designated for implementation under the ***Cooperation*** programme and international actions in the field of human potential under the ***People*** programme (see below). But it is in the ***Capacities*** programme that one finds identification of particular horizontal actions and measures in support of international cooperation. Under the activities listed here there is specific mention of groups of countries to be targeted that resonate with those specified in INCO in past Framework Programmes (as reviewed in the Inception Report): Candidate countries; countries neighbouring the EU; Mediterranean partner countries; Western Balkans and the Newly Independent States (NIS); Developing countries focusing on their particular needs; Emerging economies.

The intention is that under the ***Capacities*** programme horizontal measures and actions will be implemented that have a focus other than that of a specific thematic or interdisciplinary area. A co-ordination role is also specifically identified in order both (a) to ensure this for international cooperation actions under the different thematic programmes of the FP and (b) to improve coherence of national activities (in Member States) by supporting coordination of national programmes on international scientific cooperation.

5.3 THE SUCCESSOR ACTIVITY TO INCO IN FP7

The ***Capacities*** international cooperation support activity has a proposed budget of €358 million over a seven year period (2007-2013). In view of the arguments already presented in this study concerning the mismatch between the allocations for INCO in FP5 and FP6 and the potential scale of the problems being addressed this at first sight might be viewed as a disappointment. It could well mean that the actions pursued and the instruments utilised will need careful focussing in order to maximise their impact.

Two essential features implied in the FP7 Proposal are (i) the achievement of targeted action distinctive from specific thematic areas within the overall FP (or from outside it) and (ii) a clearly thought out monitoring capacity over the FP as a whole to achieve the coordination required in order to identify needs and to generate assessments of the extent and impacts of international cooperation overall. This might be seen as providing the "glue" needed across the whole FP so that the international cooperation enterprise has a coherence. Both features ideally would have a catalytic effect.

The former INCO institutional experience has a significant value and could with advantage be put to good effect through involvements with other programmes in those projects or initiatives that have a strong "third country" component – even to the extent of internally sub-contracting management responsibility to the former INCO capability where relevant and under appropriate arrangements. It appears from the Proposal document to be the intention that operational activities under FP7 will be implemented through a form of executive agency for the purpose while Commission staff members are primarily responsible for policy-related areas. If this is what happens, the indications for involvement of the INCO accumulated institutional experience would have to be put in place in this context.

A further disappointment for some will be the possible loss of identification of INCO as a name that has some impact especially in developing countries. There is an argument that it should be retained if at all possible. However in FP7 as proposed where activities involving international cooperation are more widely deployed (see below) the retention of an acronym name based on international cooperation for a specific programme area could be seen as being inappropriate. Certain aspects of the ***Capacities*** programme that are previously identifiable as of INCO origin (in FP5 and FP6) might be thought of as reflecting development value (for the activities proposed in the groups of countries identified) so that the S&T envisaged here is more a matter of *international cooperation with third countries in development science* rather than overall international scientific cooperation in its own right. So if an operational label is needed one might propose a **development science (DS) focus** as reflecting what is intended so indicating the science dimension rather than risk seeing the activities envisaged only as development aid inputs albeit within a research programme – a potentially inappropriate position.

Even so if the DS focus is to provide S&T inputs appropriately to third countries with particular requirements there is a need for close liaison and dialogue with those in other Directorates-General such as Development and RELEX and appropriate Member State and other institutions who have awareness of what is required on a broader basis than current scientific questions. This is done to some extent now and must continue and be enhanced. Achieving real value from the DS focus with its limited financial allocation requires a high quality effort in targeting, relevance and opportunism for each activity if it is to result in genuine impact on particular third country needs. This requires the involvements of various stakeholders providing a platform from which any given project can be formulated. The derivation of a DS project therefore should be “bottom-up” in nature rather than being policy-driven “top-down”. Potential contractors have a vital part to play in understanding this scenario. Many with former INCO experience know very well the situation “on the ground” in many third countries and have devoted a lifetime’s professional work to it. The Commission will have to draw heavily on such experience if the targeting of its resourcing is to pay dividends in this “bottom-up” approach.

It also needs to be remembered here that the horizontal actions and measures envisaged in the Proposal document for implementation in this activity of FP7 should have a focus other than a specific thematic or interdisciplinary area - and ideally it would be desirable for them to have a seed-corn or catalytic effect. In this connection it is noteworthy in the Proposal that the ***Capacities*** programme specifies objectives demonstrating a basis of “mutual interest” *and* “mutual benefit” in order to address specific problems that third countries face. In contrast the ***Cooperation*** programme specifies only “mutual interest” for specific theme-based cooperation actions dedicated to third countries.

The instruments available are also important in addition to the designation of the particular geographical categories in which they might operate. Some such as Candidate countries and Emerging economies might be seen as better suited to theme-oriented international cooperation for “mutual interest” in the ***Cooperation*** programme. (Nevertheless one of the stated aims in the Proposal in this area in the ***Capacities*** programme is to unlock the research potential in such regions - a catalytic

action in the sense referred to above). In contrast developing countries and some countries neighbouring the EU (Mediterranean partner countries, Western Balkans, NIS) might be seen as more "needs-driven" and so "mutual benefit" assumes more importance. Here there might be a particular requirement for well-specified Collaborative Projects that address a clear need and/or will lay the groundwork for further theme-oriented project inputs in the future.

Coordination and support actions are likely to be a vital feature in the establishment of stakeholder platforms from which projects will emerge later either initially in the ***Capacities*** programme or subsequently in the ***Cooperation*** programme. Networks of Excellence might be seen as having real potential in developing capabilities in Candidate countries and Emerging economies. Whatever the mechanism and the involvement the message is that it will need careful thought if the limited resources are to be spent wisely and act as "seed-corn" for things to come later (a catalytic project). In this area the stated objective in the ***Capacities*** programme of supporting European competitiveness through strategic partnerships with third countries in selected fields needs to be kept in mind.

The remaining feature set out in the ***Capacities*** programme that has an operational aspect in part deriving from former INCO responsibilities in FP5 and FP6 is the effort to be undertaken to improve coherence of national activities by supporting coordination of national programmes on international scientific cooperation and assuring the overall coordination of international cooperation actions under the different programmes (especially ***Cooperation*** and ***People***) of FP7. These are difficult operational areas and the former has not been strikingly successful in the past. To be so it is likely that these activities will need to be led at a very senior level if major players are to become involved. This more policy-related activity under the FP7 umbrella that has some modest resonance with INCO responsibilities in FP6 (and even FP5) might be thought of operationally as an **international cooperation science policy (SP) focus.**

Within the Framework Programme it is vital that there is some strategic overview developed and reported on concerning overall international cooperation partly as a counter to the evolution of distinctive policies and approaches especially in the different ***Cooperation*** programme themes of FP7. There will be a need for *ex ante* assessment of the international cooperation potential existing, including a good understanding of the need to be addressed, and what is envisaged in different themes and how coherence between themes can be guaranteed when this is needed. There will be a further need for *ex post* assessments either independently or in conjunction with different themes to see what has been done and the outcomes and impacts achieved. Such studies should then lead directly into the further development of policy and any necessary changes of objectives. The extent and efficacy of stakeholder consultation and involvement also will have to be monitored in assessing whether the overall objectives for FP7 are being addressed and fulfilled in the international cooperation area. The whole of this role should not simply be reactive. It needs to have strong leverage so that resources are put where they are needed. It might even act as a FP 'entry point' for third countries.

One of the key objectives of ERA is to reduce the fragmentation of research efforts in Europe. Progress has been made in past FPs at project level but relatively little at the crucial level of national/regional programme coordination. Achieving coherence of

national activities through supporting coordination of national programmes remains a key component of the ERA objectives. Research ministers have recognised the importance of achieving the mutual opening of national research programmes (Girona 2002) and in the same year CREST launched pilot actions for this in five identified areas with appropriate working groups. It remains a long term perspective requiring a strategic decision by the countries involved. The FP7 Proposal recognises that the FP6 ERA-NET scheme remains the favoured mechanism for networking such programmes and developing and implementing joint activities. The use of Article 169 of the Treaty is also an important vehicle for this purpose - the European and Developing Countries Clinical Trials Partnership (EDCTP) was an example of its use. But constructing a European portrayal of international cooperation activities that can be of value in policy formulation will not be easy. The European added value of any proposed action will have to be clearly demonstrated. Nevertheless coordination of research programmes is recognised as a major priority for European research and has been identified by the Commission in June 2004 as one of the six axes of the guidelines of EU policy to support research.

5.4 OVERALL INTERNATIONAL COOPERATION ACTIVITIES IN FP7

In addition to certain recognisable successor INCO activity in the ***Capacities*** programme of FP7 described above (the operational foci DS and SP) there are many other facets of broader international cooperation identified in the FP7 proposal. For example even within the ***Capacities*** programme containing the horizontal actions and measures in support of international cooperation described above there are activities providing support to new Research Infrastructures that have criteria relating to relevance at international level. In the area of Research Potential disseminating and transferring results on international markets is specified as is use of international independent expert evaluation. In the Science in Society activities area the challenges of globalisation are also mentioned.

In the ***People*** programme attracting to Europe researchers from the entire world is indicated in the programme objective and within the rationale for the programme the need to "support a beneficial circulation of researchers and their knowledge, both within Europe and in a global setting" is identified. Activities in this programme include reference to a trans-national/international mobility experience and there is specific mention of the international dimension to increase the quality of European research by attracting research talent from outside Europe and fostering mutually beneficial research collaboration with researchers from outside Europe. There is also specific mention of support to countries with which the EU has a Science and Technology agreement and of measures to create networks of European researchers working abroad. Again the role of an executive agency is envisaged for implementation of aspects of this programme particularly in respect of Marie Curie actions. It is also indicated that these actions will be implemented in line with the international activities under the ***Cooperation*** and ***Capacities*** programmes.

The ***Ideas*** programme involves actions in frontier research to be implemented independently by a European Research Council. It is claimed that the actions will reinforce the dynamism and attractiveness of Europe for the best researchers from both European and third countries.

However it is in the ***Cooperation*** programme that most of the broader and substantial aspects of international cooperation are identified and so can be foreseen. It is specifically stated for this programme that international cooperation between the EU and third countries is an integral part of this action. It is envisaged that support be provided to trans-national cooperation at every scale across the EU and beyond. The over-arching aim of this programme is "to contribute to sustainable development within the context of promoting research at the highest level of excellence" (COM (2005) 440 final Annex I) and nine themes are identified for EU action making this programme by far the largest in the FP7 proposal. The themes are Health; Food, agriculture and biotechnology; Information and communication technologies; Nanosciences, nanotechnologies, materials and new production technologies; Energy; Environment (including climate change); Transport (including aeronautics); Socio-economic sciences and the humanities; and Security and space. The themes include research needed to underpin the formulation, implementation and assessment of EU policies in a range of areas – including development aid. In each theme the possibility to address two types of opportunity is foreseen – emerging needs and unforeseen policy needs. Though not specified poverty alleviation would clearly be a candidate in the former category thereby underpinning the type of DS research referred to above. In fact it is stated that across all the themes support to trans-national cooperation will be implemented through types of measures that include international cooperation. Joint Technology Initiatives are envisaged on the basis of a series of criteria among which - though not specified - relevance to international cooperation might be included.

All activities carried out in the thematic areas will be open to all researchers and research institutions from third countries with a strong effort being made for them to "seize the opportunity provided". Furthermore specific cooperation actions will be undertaken in each thematic area dedicated to third countries through "mutual interest" in cooperating on particular topics. These actions will serve as privileged tools for implementing the cooperation as a result of close association with bilateral cooperation agreements or multilateral dialogues between the EU and the countries or groups of countries involved. Such actions are seen in particular as (i) actions aiming at reinforcing the research capacities of candidate countries as well as neighbourhood countries and (ii) cooperative activities targeted at developing and emerging countries focusing on their particular needs in fields such as health, agriculture, fisheries and environment and implemented in financial conditions adapted to their capacities. The intention is that this part of FP7 covering international cooperation actions in each thematic area and across themes will be implemented in coordination with those under the ***People*** and ***Capacities*** programmes of FP7. In particular therefore working relationships with the DS and SP operational foci in the ***Capacities*** programme as outlined above will be important.

Some examples of specified potential international cooperative involvements in the thematic areas of the ***Cooperation*** programme are noted below:

In the Health theme there is mention of allowing Europe to contribute more effectively to international efforts to combat diseases of global importance; mention of international networks in order to achieve significant conclusions in epidemiological research; and specific mention of global threats of HIV/AIDS, malaria and tuberculosis as well as emerging epidemics such as SARS and highly pathogenic influenza.

In the Food, Agriculture and Biotechnology theme research into the safety and integrity of food and the food chain also mentions the need to fight infectious diseases such as transmissible spongiform encephalopathies and avian flu and more widely in animals including zoonoses; technology platforms contributing to global animal health; research providing a knowledge base to support agriculture and trade issues; and sustainability issues such as rural development, multifunctional agriculture and forestry.

In the Information and Communication Technologies theme there is mention of researchers being involved in the global race to achieve further miniaturisation and the convergence of computing, communications and media technologies; the need for a range of networks from personal to global to achieve higher volumes of data anywhere; technology-enhanced learning systems; support to other scientific areas such as improving disease prevention and support to environment and sustainable development to reduce vulnerability; and prevention of digital divides by improving inclusion and equal participation.

In the Nanosciences, Nanotechnologies, Materials and new Production Technologies theme there is mention of the need for the EU to increase its position in a global context and the relevance of these technologies to several other scientific areas that have international cooperative involvements.

In the Energy theme developing solutions to trends in global energy demands are mentioned; the need to drastically curb emissions of greenhouse gases; international climate change actions; and questions of instabilities (including geopolitical factors)and disruptions in energy supply and price.

In the Environment (including Climate Change) theme there are, as expected, several indications of international involvements as environmental issues by their very nature go beyond national frontiers and require a coordinated approach often at a global level. There are also several international commitments to be met (e.g. Kyoto, IPCC, UN Convention on Biological Diversity, World Summit on Sustainable Development) where research is required. Also there is a world market for environmental technologies where the EU needs to strengthen its position and research required in earth observation systems for understanding and predicting environmental phenomena.

In the Transport theme the importance of the global market to European industries is indicated and the support of technologies such as global satellite navigation systems (Galileo).

For the Socio-Economic and Humanities theme there is emphasis on the quality of life and global interdependence; Europe in the world and understanding change between world regions and emerging threats and risks; cultural interaction and issues relating to the protection of fundamental rights and the fight against racism and intolerance; and questions of international trade, external relations and the globalisation of knowledge.

In the Security and Space theme there is mention of activities concerning containment of the effects of terrorist attack and the need for international security research efforts.

Clearly the ***Cooperation*** programme has the potential for international S&T cooperation actions of considerable substance. This potential and the range of possible

involvement globally make the need for coordination and an overview of the extent of the FP international cooperation activities quite crucial if disaggregated approaches and appraisals are to be avoided. This could be damaging to developing a European position in international scientific cooperation and make any European added value virtually impossible to assess. Addressing this need is quite distinct from what is required for delivering horizontal actions in the mode of the INCO research programme as we have seen it previously from FP4 to FP6. The need here is one of monitoring, portraying and stimulating the larger picture of international scientific cooperation as a whole across the FP and creating that coordination and coherence necessary for its overall recognition rather than it being seen as a set of disparate and unconnected parts. This is the “glue” referred to earlier.

It is primarily in this programme area and the ***People*** programme area where delivery of actions to support several of the S&T Agreements concluded by the EU should occur. Their purpose as stated in the FP7 Proposal is to strengthen international research cooperation with a view to further integrating the Community into the world-wide research community. This is a purpose that necessarily embraces the totality of FP activities. The negotiation, evaluation and administration of the Agreements has been the responsibility of the INCO programme area in the past but the former INCO programme alone did not have the capability needed to fully implement the actions required to give such Agreements operational substance. As a result their value has not been fully exploited and they have appeared to languish.

5.5 THE FUTURE OF INCO

So there are now two distinct roles identifiable in the area of international cooperation. Firstly a horizontal operational one in the ***Capacities*** programme with a clearly recognisable derivation from the former INCO programme research areas for which a development science (**DS**) operational focus was suggested above. Secondly a policy-related coordination, monitoring and stimulation role looking across all areas of international cooperation in FP7 in order to provide a portrayal of it across the FP as a whole - so providing a coherence or glue for the entire international cooperation endeavour that would otherwise be lacking. It should assess needs and act as a catalyst to resourcing them. This role should also include action to achieve coordination of national programmes to further enhance coherence and contribute to ERA. For presentational convenience an international cooperation science policy (**SP**) operational focus was suggested above.

In summary in terms of executive action in FP7 under the activities of international cooperation heading in the ***Capacities*** programme it is suggested that:

- A **DS** operational focus could be responsible for projects and other research actions in cooperation with third countries as set out in the FP7 proposal document but with emphasis primarily on Developing countries. A further grouping would include countries neighbouring the EU, Mediterranean partner countries, Western Balkans and the Newly Independent States. The interface of this latter group with initiatives such as ISTC, STCU and INTAS still needs some further thought as the procedures used in these activities presently do not fit with those of the FP and there are other international actors involved.

Cooperation with Candidate countries and Emerging economies is more likely to be appropriate to the other programmes of ***People*** and ***Cooperation***. This apart the projects and other activities funded through FP7 should have certain characteristics that will maximise the benefits to be gained from the limited funding allocation to this horizontal action. These have been indicated above and should also include proper contact with other relevant DGs, national bodies, third country/regional agencies and experienced contractors. This DS focus might also have operational responsibility for, or be involved in, projects involving specific third countries that were initially within a theme of the ***Cooperation*** programme if that programme has chosen to invite them into, or chosen to have them manage, a given project or group of projects.

- The **SP** operational focus should be responsible for developing an overall portrayal of international cooperation activity across the FP and stimulating and monitoring it - taking action as necessary to achieve coordination and coherence in the FP and more widely in the Commission and nationally. It should devise *ex ante* appraisals of opportunities and needs for international cooperation and *ex post* evaluations of what has happened, its outcomes and impacts. It should be particularly concerned with international cooperation activities with a range of third countries in the ***Cooperation*** and ***People*** programmes and the interface of this with the horizontal activity in the ***Capacities*** programme wherever appropriate. It should be the source of policy advice on international scientific cooperation and report at a senior level.

1. ANNEX 1: ON-LINE SURVEY

This is provided as a separate stand-alone document.