

RESEARCH AND ADVISORY CENTRE FOR INTERNATIONAL EDUCATION: AN APPROACH FOR SENDING COUNTRIES

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Abstract – For developing countries, industrialisation may be held back by the shortage of managerial and technological knowledge which can only be acquired through a long process of education and training. In order to meet the demand, many developing countries - including many of the twenty countries bordering on the Mediterranean - have invested in international education by sending their students abroad to improve their technological capability by acquiring technological knowledge and technological expertise from already established institutions in industrialised countries. Major essays are written on the subject of international education in which recommendations are put forward to improve the practices of education in host institutions. However, few recommendations have been directed at the sending countries for appropriate actions to be taken. This paper seeks to address ways in which developing countries can participate in international education activity. It proposes a research and advisory centre for international education to be established in sending countries in order to benefit from their investment.

Introduction

The acquisition of knowledge from one place to another is not a recent phenomenon. For centuries centres of knowledge and other institutions have been welcoming international students and scholars (Feizi 1990; Barakat 1988; Williams 1990; Saqeb 1992; OST 1982). The objectives of higher education institutions involved in international education are many. Among them is the aim to equip such students to become contributors to the world community; to expose both local and international students to the diversity and interdependent nature of our world; to gain financial benefits in terms of income generated by the presence of international students; to promote international goodwill and understanding, and to assist international students especially from the Third World seeking the technological knowledge and technological expertise needed for industrialisation and development (OST 1982).

From the sending country's perspective, there are two dimensions behind

international education. One is a personal interest (student) and the other is a national benefit (country). Among the personal interests may be the desire to gain a prestigious internationally recognised qualification; a window on another culture; a worthwhile degree to use in the home country; the benefit of gaining another language; and other personal gains such as knowledge for its own sake. The national interest is in receiving advanced training that is not available at home. Many developing countries have sent their nationals abroad for highly specialised education that they are unable to provide but require (UN 1972; Graham 1982; Maciotti 1979; Jenkins 1983; Gucluol 1986; Richardson 1978; Al-Ali 1988; Makepeace 1989; Barakat 1988; Fonge 1987; and Zelmer and Johnson 1988). The fact that students from developing countries (sending nations) continue to come for education in developing countries (host nations) in increasing numbers is an indication of the real developmental needs for technological knowledge and technological expertise (Richardson 1978).

'...the transfer of technology from...developed nations to developing nations is a very important process, and...the hundreds of thousands of foreign students...form a significant component in this transfer process' (Jenkins 1983:2).

In addition to the international students', sending countries', and host countries' perspectives, international education can serve as channel of understanding between nations rather than a diplomatic means, as Fullbright (1983:x) pointed out:

'The interchange of students and scholars across national borders...is the most effective way to enable humankind to apply reason rather than arms to the arbitration of international problems...Educational exchange between nations of different cultures is relevant to the reasonable solution of their differences and allows people to demonstrate their capacity for humane conduct'.

Appropriateness of education

In the field of international education, the problem of appropriate education is more complex. Questions are raised about what is taught, how it is presented, and how it will be used. Tran (1990) defined the *appropriate technology* as follows: *'Appropriate technology is basically technology which is most able to achieve the goals of economics, social and cultural development which have been set by the country receiving the technology' (p.122).* As the question is frequently put,

are developed countries' technology curricula relevant to the development in developing countries? According to the Institute of International Education (1988), in spite of much discussion and recommendations for modifying science and engineering programmes to provide more appropriate services to developing countries, '*...such modifications have generally not been made*'. Yet, as the number of international postgraduate students has grown, '*...perspectives on the relevance issue have shifted drastically*'. Some engineering academics, especially from the United States, '*...now voice concern about the possible intrusion of developing-country problems into the training and research in the US engineering schools*' (Institute of International Education, 1988:5). Thus the question for students in the developing countries is not simply one of whether or not they can attend a foreign university, but one of whether or not they can be provided with the appropriate type of technological knowledge and technological expertise in the host industrialised countries. This poses the further question whether graduates will be able to transfer their knowledge to the local environment after the conclusion of their studies (Gucluol 1986). Makepeace (1989) pointed out that there are more fundamental issues, such as whether it is ethical to provide education for international students without sufficient consideration about the appropriateness of that education to the developing nations, and whether the effect is to prevent the development of education in the sending countries. Specifically, Gucluol (1986: 33) maintained that: '*...if the higher education institutions of the advanced countries really wish to help educate foreign students, they should learn more about the applicability of their own educational aims and ideals to the developing countries*'. Similarly, Richardson (1978: 2) stressed that if an institution is to serve international students, monitoring of the needs of international students would be useful:

'When an institute...works in the area of application of technology, and either explicitly in terms of its statutes, or implicitly by accepting large number of students from the third world, is involved in the transfer of technological skills as an attempt to help in the solving of development problems in societies that are changing even more rapidly than those of the industrialised West, then monitoring is a necessity.'

Power and Gertzel (1990) criticise international students for not helping themselves to obtain appropriate education by putting qualifications first, before relating their education to the needs of any particular job, described by Dore (1980) as the *Diploma Disease*. Brandt (1980) stressed that only developing countries themselves know what suits their own local needs, and suggested that special international support should be given to research into more efficient

production, development and the improvement of the market competitiveness of those raw materials mainly produced in developing countries. Richardson (1978) stressed that a course aiming for technology transfer should consider employer's needs and priorities, country needs, and alternative training facilities and costs in the student home country, or in other countries, either developing or developed.

The Inter-University Council for Higher Education Overseas (IUC) produced a report concerning the appropriateness of training received by international postgraduate students in Britain. The report reveals that some supervisors, anxious to have research students to assist them with their own academic advancement, give little regard to the relevance of the training received by international students. Also the research topic might be so remote to a student's need in his country (British Council Committee for International Co-operation in Higher Education, 1986). Lulat, Altbach and Kelley (1986) explained this by the fact that members of PhD committees often do not have the expertise to supervise a project specific to a student's home country, and also it requires too much time and effort to supervise field work in a foreign country. The report also highlighted the second concern that in Britain there had been considerable discussion about broadening the PhD by including advanced courses or to follow masters with taught courses before embarking on research. Similarly for the UK students, the Office of Science and Technology (1994: 3) in the May 1993 white paper *Realising Our Potential* in relation to research training for postgraduate UK students stated:

'The government welcomes the growth in postgraduate courses. It is concerned, however, that the traditional PhD is not well matched to the needs of a career outside research in academia or an industrial research laboratory.'

Similarly in the United States, arguments are mounting on the need to reshape postgraduate education by changing the practice and curriculum for more appropriate education. According to a report from the National Academies of Science and Engineering and the Institute of Medicine, only about a third of new US PhD holders in science and technology will end up working for the academic world. Unfortunately for the other two thirds of the PhD graduates, their doctoral degrees have equipped them for an academic career but not one outside academia (Cage 1995). If this is the case in host countries, '*...It is not surprising that the developing world is becoming increasingly sceptical of each 'assistance' when one hears of growing concern in Britain itself of the irrelevance of much of higher education to meet its own economic and social needs*' (Salmon 1977, in Richardson 1978:2).

In the UK, universities are under an increasing pressure resulting from '*...a mixture of student anecdotal feedback, institutional guilt, Government pressure, Research Council agenda and external audit*' (Halliday 1995: 69). The considerable pressure to modify the PhD programmes has produced a call for a better, more structured system of PhD training (Kipling 1995). The Office of Science and Technology has proposed two models. The first is a new Master of Research which will act as a filter to a PhD. The second model is to enhance the existing PhD to provide research skills training (Walsh and Mills 1994). As a result of debate by professional bodies, several universities have chosen to move toward the second model by introducing research skills training courses as part of the existing PhD programme (Clark 1995), while others are still discussing the required changes (Walsh and Mills 1994). Also industry is in favour of broadening research training, which recruits PhD students for '*...their research awareness and training, for some specific skills and for technology transfer*' (Advisory Board for the Research Councils, 1993: 11). Examples of the recent developments of research training can be found in Clegg (1994), Daniels and Akehurst (1995), Lowe and Murray (1995), Powell (1995) and Halliday (1995).

Although many criticisms were noted with regard to the appropriateness of technology programmes available to international students in the host countries, the author believes that the lack of co-operation between developing and developed countries contributed to the problem of appropriateness. The United Nations Conference on Trade and Development (UNCTAD) gave clear pointers as to the importance of co-operation in its resolution:

'...recommends that developed countries...encourage taking into account the priority of developing countries, universities and research and training institutes and technical school to create special programmes and curricula for developing countries and to work closely with corresponding institutions in developing countries' (in Richardson 1978: 3).

The literature reveals that co-operation between institutions exists between different developed countries rather than between third world countries and developed countries. One example of this co-operation is the Japanese investment in several American colleges for both Japanese and American students (Wagner and Schnitzer 1991). Since 1992, the United States Information Agency has supported North American higher education co-operation among Canada and United States (Craven 1995). In the UK, Barnes (1991) reported that several British higher education institutions have initiated and developed links with American institutions. Literature on this topic also revealed a similar pattern among European students who study in another country as part of an organised

joint study programme: the European Community's 'Joint Study Programme' scheme, the 'Integrated Study Abroad' scheme run by German Academic Exchange Service (DAAD), and the Swedish 'Internationalisation of Higher Education' programme (Teichler and Steube: 1991).

Also there are other co-operation programmes within the European community for the purpose of technology transfer. Among those, the University-Industry Co-operation in Education and Training (COMETT) '*...aims to strengthen and stimulate community-wide co-operation between universities and industrial or other enterprises in respect of technological training*' (Carpentier 1989: 21). One example to illustrate such co-operation is the University Alliance of Grenoble which has used the COMETT programme '*...to enable over 100 students to attend courses in European companies to prepare to implement technology transfer operations through which students learn about the human constraints of transfer within enterprise settings*' (Skilbeck and Connell 1996: 18).

Power and Gertzel (1990) suggested that while there has been increased emphasis over the past decade upon the internationalisation of higher education, a higher level of co-ordination between donors and receivers is needed and this can be achieved when education is treated as an overseas assistance. Similarly, Williams, Woodhall and O'Brien (1986), in a survey of British institutions, found that at the university level in particular, respondents thought that links with overseas' institutions such as staff exchange, research collaboration and joint courses, are becoming an increasingly popular way of targeting student recruitment efforts, as well as enabling a better understanding of international students.

The current situation

To address the needs and expectation of overseas students, it is apparent that most research recommendations are directed at the host countries, involving the issue of adjustment of international students, and few recommendations are directed at sending countries. In the conclusion of the study of Fonge (1987), seven recommendations were made. Although three recommendations are in the area of academic concerns, none of these are directed at the sending country. Similarly, Ukaegbu (1989) presented 19 recommendations in his thesis, only three of which were directed at the sending country. Also, among the 24 recommendations presented by Barakat (1988) at the conclusion of his study, only one was designed for the sending country. Other researchers who presented recommendations only to host institutions include: Kinnell (1988), Feizi (1990),

and Chinapah (1986). Similarly, the British Council Committee for International Co-operation in Higher Education (1986) presented nine recommendations to host universities and none to sending countries.

Host countries' higher education institutions expend considerable resources in attracting international students to their institutions and in serving them whilst they study. This, together with the increasing competitive nature of the international student market, has prompted several agencies to conduct a national study into the decision-making process and experience of international students studying in British higher education institutions. Those agencies, without exception, are established in host countries, which reflect only one part of the international student question, i.e. the concerns of the host countries and their institutions, and they do not involve themselves in the selection process of technological knowledge programmes.

'The literature on foreign students remains dominated by a few countries...the concerns of the major host countries...dominate the literature. The research and publication on foreign students and international study done in Third World – source of most of the world's foreign students – is minuscule' (Altbach and Wang 1989: 4).

Those agencies contribute to the issue of adjustment by presenting guidelines and recommendations to the host institutions, including: *Do It Yourself Guide to Welcoming International Students*, UKCOSA (1992); *CVCP/CDP Code of Recommended Practice*, CVCP/CDP (1992); *Overseas Student Handbook*, National Union of Students (no date). Also there are many publications in the United Kingdom designed for international students, including: *Young Visitors to Britain*, Central Bureau for Educational Visits and Exchanges (1987); *Graduate Study at Universities in Britain*, Association of Commonwealth Universities (1990); *Planning to Study in Britain*, UKCOSA (1992); *Studying and Living in Britain*, British Council (1990); *Guidance Notes for Students*, UKCOSA (1987). The authors of these publications direct their concerns to international students while in the host country.

Although such publications are available in book stores and libraries, the question may be asked how many students have access to them before coming to the host country. It appears as if the authors assume that those students live in the UK. One wonders how the student is helped to choose a course and a university when he/she has had to make a decision before his/her arrival in the host country and his/her visa was issued based on that decision. Such publications do little to help students make a selection on criteria of appropriate technology and technology transfer.

Approaching international students only from the perspective of the host countries is an error in terms of the transfer of technological knowledge and technological expertise. The authors, as Brandt (1980), believe sending countries should give more consideration as to how they can help their prospective students make sound decisions.

'It is surprising that these countries, which have such a major stake in foreign study, have taken so little interest in generating data and analysis relating to the issues from their perspective' (Altbach and Wang 1989: 4).

Unlike others, the authors will consider the problems from the perspective of the sending countries. They do not put forward a single solution, but attempt to focus concern on sending countries, so as to encourage international students and their sponsors to look at their own future and decide for themselves if they want to proceed to universities in developed countries.

'There is a significant literature, perhaps the majority of studies, that are about Third World students in industrialised nations...but such research generally does not explore these questions from a Third World perspective. Any future research agenda concerning foreign studies must take into account the needs and perspectives of the...sending countries' (Altbach 1991: 307).

Research and Advisory Centre

The lack of information about educational opportunities available abroad is a contributory factor for inappropriateness of education. Many sending countries have no co-ordinated policy with host institutions. The sponsoring authorities specify the criteria for studentships for international postgraduate education but do not engage in the process of selection and admission. Also, many sponsoring authorities do not provide information about courses or institutions. Given the number of specialised courses which come under one subject of universities, it is no surprise that students face problems in choosing appropriate education. This is especially true if the prospective student does not have a command of the language and needs a letter of acceptance for his/her visa application before even setting foot on a host country's soil. The importance of advisory services and information to international students before leaving home was also identified by Kinnell (1988) in her study on overseas students at both Nottingham and Loughborough Universities regarding students needs and expectations:

'Pre-arrival communications to students in their home countries were seen as a vital prerequisite to a proper understanding of, first, British culture and higher education in general, and second, the specific institution, its expectation, academic programmes and facilities' (p.131).

The need to advise prospective students is accentuated by changes in the international educational scene, such as the increased number of courses and options offered to postgraduate students. With more educational choices to be made, there is a need for people who are professionally skilled in helping students, as well as their sponsors, to make their choices. What the authors would seek is that each student and his/her sponsor should be helped to achieve a sense of purpose and to see the goals before he/she leaves his/her country for international postgraduate.

'Overseas students will...take back good reports of their experience...only if the courses offered are relevant to their needs, and if adequate and timely information necessary for an appropriate choice of course and institution is readily available' (UKCOSA 1986: 13).

Hence, the authors suggest that developing countries should establish their own research and advisory centres for international education. Such a centre should serve as a consultancy and information clearinghouse on international education. The research and advisory centre should enable students and their sponsor to identify the most suitable educational opportunities in host institutions by providing advisory services and preparing special brochures that give information about the curricula offered in English and in the national languages. The advisory service should include ready advice about the educational opportunities, provision of information about what is in store for students during their international experience, academic support and monitoring while in the host country, and advice to sponsors regarding the selection of potential students. To guide decisions, the suggested centre should sponsor relevant research. Some of the activities may be carried out through links with host countries.

Having a research and advisory centre, dealing with all matters relating to international education, would not only benefit the sending country, but also the host institutions. Students also could benefit from such a centre in that they would only have to visit the centre locally. If established, its advisory and support personnel would provide a continuing service and support to the students and their sponsors from the moment they begin considering education abroad, until they have completed their programmes.

Selection of educational programmes

In the area of selection of appropriate technology educational programmes, the recommended Research and Advisory Centre for International Education should play an active role in the selection of appropriate courses by advising and encouraging enrolment in postgraduate taught courses with technological knowledge curricula that are most appropriate for the students' and their nations' needs. For postgraduate research programmes, research students should be encouraged to enter research programmes which offer research training courses as part of the research programme. In this way, research programmes will contribute not only to producing a competent researcher, but also to the ability to transfer the gained technological expertise. One consequence of the traditional PhD practice was *'...the production of researchers unable to transfer their abilities to other research situations'* (Daniels and Akehurst 1995: 8).

In many industrialised countries, linking university to practical experience is a favoured model for teaching and learning (Szabo 1995). With sending countries, such links and co-operative arrangements are still rare and there is no general agreement on the appropriate form of such links. Since the United Kingdom is one of the major host countries for international students, the authors believe that any proposed co-operation is viable especially when *'...the introduction of PhD into the British higher educational institutions dates back to the early 1920s as an attempt to attract international students at the time'* (Archibong 1995: 86). In addition to the philosophy and motivation behind both industry and higher educational institutions, there are benefits resulting from such arrangements. Powles (1994) wrote that some of the benefits of university-industry interface *'...translate into advantages for postgraduate students in that they become acquainted with work in industry, their employment options are multiplied, and they gain access to additional funding, resources and facilities for their research'* (p.216).

In order to smooth the process of co-operation between the sending country's industry and the host country's universities, joint supervision from both countries (sending and host) is desirable (British Council Committee for International Co-operation in Higher Education 1986). Also, joint supervision will help research students to engage in research relevant to his/her country as Lulat, Altbach and Kelly (1986) stated that PhD supervisors *'...often do not feel that they are knowledgeable enough to supervise research on problems specific to the student's home country...requires too much time and effort to supervise a student doing field work thousands of miles away'* (p.45). The suggested research and advisory centre could persuade both industry and universities that there are major

opportunities for co-operation, and that the difficulties are manageable and the traditional divide is bridgeable.

Selection of students

The proposed centre for international education could play an active role in the selection of students if the sponsoring agencies allow the centre to make such an assessment of potential students in co-ordination with the host institutions. The literature suggested that students selected by their governments are not necessarily the kind of students who should be given the opportunity, as Parish (1977: 9) stated: *'...unfortunately, student candidates from third world countries are often selected by their government or other authoritative bodies, and they are not necessarily the kind of student we would like to see in our courses'*. The sponsored students should be selected for international training, not because they wish to see the world, or because they volunteer, but because they are suitably qualified and suitably motivated to be effective learners and suitably placed to pass on the technological knowledge. A year or more in industry before leaving home for international education would make students familiar with the conditions and needs of local business which will help them to identify the kind of education in demand.

'Postgraduate students should be encouraged to gain experience of working in industry for one or two years before returning to study. These students may be aware of the conditions and problems of industry, and they will help the development of the economy' (Boliang 1989: 115).

During the overseas experience

First-hand experience of differences in educational approach and content is considered by students and institutions to be an additional benefit of international education. These differences in approach, expectations, language and way of life are also sources of problems for international students. UKCOSA (1985) reminded those working with overseas students that those students face problems of adjustment to life in Britain in addition to the general pressure experienced by students as a whole. These might include being in a strange country, understanding and complying with bureaucratic necessities such as immigration controls, and being educated in a foreign language in a different educational system. Various studies indicated some similar and/or different problems experienced by different groups of students: Blue (1980), Kendall (1986), Niven

(1987), Ryan (1977), Velle (1988), Goldsmith and Shawcross (1985), Abdou (1989), Al-Sherhy (1989), Shahmirzada (1988), Feizi (1990), Naido (1990), Barakat (1988), Ukaegbu (1989), Fonge (1987), Porter (1962), Williams, Woodhall and O'Brien (1986).

The research and advisory centre could expand to play a part in the student's experience in the host country. There is a dilemma for the international student. He/she comes on a conveyor belt out of the sending country's different educational system and finds the host institution's experience different from what he/she anticipated. He/she may then want to leave as he/she feels trapped. The advisory centre could explore this with the student and offer support. When the student sees the alternatives open to him/her and sees other possible avenues, he/she may then decide to stay. The authors believe that without a branch of the suggested research and advisory centre in the host country, the international student may well have to endure a miserable period abroad. Many such international students lose all motivation not only to acquire technological knowledge but also to return home. Their potential is lost, and the money spent on international education wasted, because extra money is not forthcoming to provide the necessary services.

Guidance and monitoring

The suggested research and advisory centre should sponsor research to guide its functions more efficiently. Since many existing organisations found in the host countries such as UKCOSA and NAFSA are pressing for policies in the host institutions, and expanding the welfare services for international students, the suggested research and advisory centre for international education should press for policies in the sending countries. This can be done by sponsoring independent investigation and relevant research; promoting and organising meetings, seminars and conferences to guide decisions as recommended by Altbach and Wang (1989: 4): *'Sending countries must weigh the implications of foreign study – economic, political, curricular, etc. – and there is very little research to help guide decisions'*. Although research on international education has been conducted, these efforts are made by the host countries alone. The authors believe that encouraging sending countries to contribute to the literature will help correct the imbalance in the body of knowledge.

'There needs to be a better balance in the research and analysis. Of course, the major responsibility for identifying topics and developing research agendas and strategies rests with third world researchers and agencies' (Altbach and Wang 1989: 9).

As a further step, to ensure the quality and standards of international education, the centre may establish an advisory board of respected leaders in international education. They would contribute their time and expertise to review the centre's programmes and policies, visit international universities to evaluate programmes for technological knowledge and suggest modifications when necessary. The advisory board could be selected from local universities, host universities, local industries, and a technology transfer advisory group. Finally, the authors believe that the proposed centre, if established, would contribute to the selection process of technological knowledge to be transferred, so that students could look for future jobs more positively rather than worrying about future careers as some studies indicated.

Conclusion and recommendations

In addition to their national institutions, developing countries have invested in international education by sending their nationals to foreign institutions in an attempt to catch up with developed countries so those students can contribute to the technological and industrial progress, through transferring technological knowledge and technological expertise. Hence, there has been an influx of international students to industrialised countries like the United Kingdom, to the point that they constitute a sizeable number of enrolments in British higher education institutions. Within this group of international students there is a sub-group, international postgraduate students, whose numbers have been increasing substantially in recent years. They are a group of highly-trained individuals who potentially can shape the future progress of their countries.

The evidence indicates that host countries do desire to be helpful and to be understood by international students. Indeed, major essays are written on the subject of international education. The evidence further indicates that there are other factors affecting the contribution of international education to the process of technology transfer. Among the major factors which affect its contribution: (a) problems and concerns that face those students while studying in the United Kingdom, and (b) the appropriateness of technology programmes available to such students. Major reports are written on the subject of international education, in which recommendations are put forward to overcome problems and concerns. However, few recommendations have been directed at the sending countries for appropriate action to be taken.

The variety of postgraduate educational programmes available in developed countries can be utilised by developing countries if the process of selection is done through professional advisory services so the effort can be integrated. To be

successful and capable of transferring technological knowledge and technological expertise, international postgraduate education should come after a carefully researched advisory service has been provided. A research and advisory centre for international education should be established in developing countries. The centre should be charged with the responsibility of improving the contribution of international education to the process of technology transfer through various functions.

The recommended Research and Advisory Centre for International Education should play an active role in students' selection of appropriate courses for the purpose of technological knowledge transfer by advising and encouraging enrolment in educational programmes with technological knowledge curricula that are most appropriate for the students' and their nations' needs. For technological expertise, postgraduate research students should be encouraged to enter research programmes which offer research training courses as part of the research programme. In this way, research programmes will contribute not only to producing a competent researcher, but also to the ability to transfer the gained technological expertise.

Ultimate productivity of international students would be greatly enhanced by encouraging research students to involve themselves in a real industrial problem either at home or in the host country. Also, joint supervision should be encouraged. In this way local industry can easily work with host universities through international education activities. This should not only smooth co-operation between host universities and sending countries, but also enhance and facilitate the development of local supervisor capabilities through interaction with host supervision. The recommended Research and Advisory Centre should play a significant role in stimulating the process of such co-operation.

Certain personal and professional qualities must be sought in selecting students for study overseas. A student must be suitably qualified, motivated to learn and able to pass on technological knowledge and technological expertise, and must possess a desire to help in the process of industrialisation. The time and money spent in the selection process would prevent the waste of investment in international training. The Research and Advisory Centre should be given the authority to assess potential students.

Some research efforts have attempted to examine the effectiveness and relevance of UK technology educational programmes to developing countries. However, as concluded in this paper, those efforts are made by the host countries rather than the sending countries. There is an urgent need to examine the effectiveness and contribution of international education to the sending country. Research in this area would help both sending and host countries to formulate their

future strategies with more confidence. Also, encouraging sending countries to contribute to the existing literature will balance knowledge in a field which is currently dominated by the host countries. The proposed Research and Advisory Centre, if established, should carry out this research and similar investigations to guide decision-makers.

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