

IIRS PERSPECTIVE ON LESSONS FROM IMPLEMENTATION OF A CROSS BORDER JOINT EDUCATION PROGRAM

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ABSTRACT:

Indian Institute of Remote Sensing (IIRS) is a premier institute in Asia Pacific region in the field of Capacity Building for Earth Observation Application and Geo-information Science. Since, its establishment as IPI in 1966, to share and upgrade the knowledge, IIRS has collaborated actively with international partners like ITC, IHE, WUR, The Netherlands, ITTO/JOFCA, WMO, UNFAO, UNESCO, ADPC, GDTA and JRC (EC) etc. The institute also hosts an UN affiliated regional Centre i.e. Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP) and conducts Postgraduate (PG) and short courses in Remote Sensing and GIS for the UN Centre yearly basis.

IIRS has been conducting short and long duration training programmes regularly for user organizations, mainly government sponsored professionals since its inception. However the major paradigm shift took place with initiation of Cross Boarder International Joint Education Programs (JEP) in 2002, thus helping Indian students to study an International Masters Programs in Earth Observation and Geo-information Science with specializations of Geo-informatics and Geo-hazards which otherwise will be difficult for them to obtain it without going abroad. Apart from financial aspects, the total costs for student being less, the JEP has specifically benefitted for upgradation of PG programs, follow international syllabus and provide a window for IIRS faculty & students to postgraduate research and evaluation international standards.

1. INTRODUCTION

The cross boarder international education programs in general benefits collaborating institutions due to exchange of expertise, sharing of resources and regular improvement in syllabus and teaching material but may not yield good results in long run, if accommodating perspectives of partner institutions and ability to attract students are not taken. The ITC, The Netherlands collaborated and provided continuous support for the establishment of sister institute IIRS, introducing programs, resource sharing including deploying faculty for certain period, training the trainers, joint research activity and improvements of programs at regular intervals. The collaboration started from the major support in the initial stage to the present status of mutual exchange of expertise and resources for the mutual benefit of both the institutions. IIRS is one among the first of many countries i.e. fifteen partner institutions currently participate in cross border education with ITC. It was rightly pointed out that the success for such programs will depend on three factors i.e. academic, institutional and financial sustainability (Molenaar, 2006).

The following sections of this paper provide an account of IIRS perspective on IIRS – ITC Joint International Cross Border Education program emphasizing role ITC in strengthening IIRS capacity building initiatives, evolution of IIRS over the last four decades, present Joint Education Programs between both the institutions, challenges that IIRS came across, lessons learnt and the benefits for IIRS.

1.1 Brief about IIRS

The Indian Institute of Remote Sensing, under National Remote Sensing Centre, Indian Space Research Organisation, Department of Space, Government of India) is a premier training and education institute dealing with Remote Sensing, Geo-information Science & GPS Technology and their Applications. IIRS was formerly established as Indian Photo-Interpretation Institute (IPI) under the aegis of Survey of India (SOI) in 1966 under the Department of Science and Technology (DST). Later it was transformed with the introduction of satellite remote sensing and name changed after merger with NRSC (formerly NRSA) (<http://www.nrsc.gov.in>), under DOS (<http://www.isro.gov.in>). The emphasis also shifted from visual interpretation techniques & aerial photography to satellites and digital analysis. It has broadened with introduction of complete spectrum of space based earth observation applications such as natural resources, infrastructure development and environmental management covering air, water and land applications. Geographical Information System (GIS) has further facilitated as decision making and modelling tools, boosted by positioning and navigation systems for quick updating of information. IIRS endeavour has been to train thematic experts from user community including academic institutions in RS & GIS technology/applications at Post Graduate level with the overall goal of 'technology transfer' and user awareness. Table 1 illustrates how the Institute has evolved over past 4 decades and has also met the needs of target group.

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Year	Chronology of developments	Significant milestone (Training to Education)
1966	Indian Photo-Interpretation Institute (IPI) established with support of ITC under Survey of India, DST	First training programs in Photo-interpretation in India
1976	Merger of IPI with NRSC	Shift from aerial photo interpretation to Remote Sensing
1983	Emphasis on Space borne Remote Sensing (RS)	Renamed as IIRS
1985	Kamat Committee report on Curriculum adopted	Revamping its training programs, shifting towards Satellite Remote Sensing
1994	Revision of its course with GIS	GIS has become an integral part of all IIRS courses
1995	Hosts CSSTE-AP, The UN	International Program
2002	Transform from training to education	Introduction of M.Sc. (ITC) and M.Tech. (Andhra University)
2006	Edusat satellite based and e-Learning courses	Widening the scope of training programs for University and others with dedicated satellite for higher education (EDUSAT) to learn anytime and anywhere

Source: V.K. Dadhwal & P.L.N. Raju, 2007

Table 1. IIRS Evolution since 1966

IIRS education and training programs are categorized into three: 1. Remote Sensing mapping and monitoring, 2. Geoinformatics technology and 3. Geoinformatics applications to Geo-hazards, leading to certificate/postgraduate Diploma/Masters degree depending upon duration and course work. Figure 1 illustrates courses structure of IIRS Education and Training Programs. IIRS has trained more than 7653 No. scientists/engineers /academicians/ individuals aspiring career in Geoinformatics and earth observation during the last 44 years. In addition, EDUSAT based distance learning outreach program was introduced for the first time in India benefitted

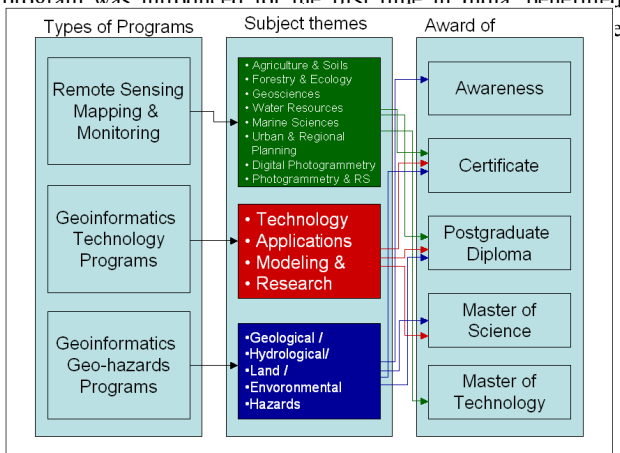


Figure 1 – Course Structure of IIRS Education & Trg Programs IIRS is the host institute as well as, headquarters for the Centre for Space Science and Technology Education for Asia and Pacific (CSSTE-AP) region under United Nations. It is first of its kind established in the region and conducts regular postgraduate and short courses in Remote Sensing and GIS every year since 1996. Except the skeletal administrative control, IIRS is overall responsible for conducting the postgraduate (PG) program and short courses (SC) on Remote Sensing and GIS with different theme every year. IIRS tops the list of maximum number of students benefitted from its programs among five regional UN Centres. Its total turnout is 474 from twenty seven countries with 263 from PG courses and 225 from SC programs.

1.2 ITC role to the present stature of IIRS

The credit for establishing and initiative to training programs of IIRS goes to ITC. It all started with having close relationship between first Prime Minister of India Late Pandit Jawaharlal Nehru and Prime Minister of The Netherlands Professor Willem Schermerhorn, founding father of ITC. Pandit Nehru visited ITC when he went to Netherlands in 1957. (Molenaar, 2006). ITC not only played for establishment but also persisted to collaborate over a span of more than four decades. The initial support was for establishment of IIRS, i.e. named as Indian Photo-Interpretation Institute (IPI) for building the capacity in training and education in aerial photo interpretation. Over different phases the emphasis was shifted according to the changing needs. The table 2 exemplifies how IIRS has benefitted from ITC with different phases of collaboration between both the institutions.

Period	Focus of collaboration
1966 to 1972	Establishment with basic capabilities of training and education in aerial photo interpretation for a range of natural resource applications
1983 to 1990	Establishment of Human Settlement Analysis Group with Urban and Regional Planning application in Remote Sensing area
1994 to 1999	Upgrading staff capabilities and infrastructure facilities in the field of Geo-information Systems applications for Natural Resources Development and Environmental Planning and Management
2000 to 2004	Strengthening IIRS as a national and regional educational institute in the field of Geo-informatics and its applications in Geo-hazards.
2005 to 2010	Joint International Postgraduate Education Program between IIRS and ITC, The Netherlands
2010 to 2015	Proposed to Extend the Joint International Postgraduate Education Program between IIRS and ITC, The Netherlands

Table 2. ITC role in establishment and evolution of IIRS education programs

2. JOINT EDUCATION PROGRAM - THE CROSS BOARDER EDUCATION WITH ITC, THE NETHERLANDS

Since 2002 IIRS has been recognized on equal partnership basis, to conduct MSc courses in Geoinformatics and Geo-hazards under Joint International Education Program (JEP) under an MOU signed by IIRS and ITC for a period of five

years during 2005 – 2010. The JEP benefitted ITC and ISRO organization and IIRS, in particular. The JEP consists of many activities with the emphasis on training and education. The details are as given below:

- Post-Graduate diploma courses (Geoinformatics & Geo-hazards) with a duration of 10 months, at IIRS (IIRS-ITC Joint Logo Program)
- Master of Science courses with a duration of 18 months, of which 15 months of time will be spent at IIRS and at least 3 course months at ITC (ITC MSc degree in Geoinformatics & Geo-hazards)
- Exchange of faculty meeting the JEP requirements
- Visit of ISRO scientists for advanced training and research programs
- Visit of ITC faculty for evaluation of Master of Science and postgraduate diploma Programs
- Jointly conducting special training programs / workshops
- Sharing of research results at the international conferences / forums etc.

The following sub headings elaborate few of the important milestones of IIRS – ITC JEP since 2005:

2.1 Significant outputs of JEP

2.1.1 Training and Education outputs

Cross Border Joint Education Program of IIRS and ITC has started in 2001 with the introduction of postgraduate diploma courses initially and upgraded them to Master of Science in Geoinformatics and Geo-hazards. The table 3 shows the total turnout of students i.e. 136 since 2005 under the present JEP.

Joint Program	Number of participants (2005 to 2010)					
	05	06	07	08	09	10
Master of Science (Geoinformatics)	8	8	9	8	4	8
Master of Science (Geo-hazards)	8	7	5	5	9	-
PG Diploma (Geoinformatics)	7	3	9	9	8	6
PG Diploma (Geo-hazards)	10	2	6	5	5	8

Table 3 – Student turnout under Cross Border Joint Education Program since 2005

2.1.2 IIRS participation in other international programs collaborated by ITC

In addition to training and education, IIRS participated in number of international research and knowledge dissemination programs like workshops/short training courses coordinated and collaborated by ITC such as RECLAIM (Asian Program for Regional Capacity Enhancement for Landslide Impact Mitigation) workshop, ADPC/CASITA (i.e. Asian Disaster Preparedness Centre / Sustainability Capacity Building on Urban Disaster Mitigation in Asia using IT and C Learning tools) workshop, SCRATCH (Strengthening Capacity on multi Hazard Risk assessment in Tsunami affected Countries) workshop and ITC-DHI training on “Application of Space Technology for Disaster Management with emphasis on Flood Risk Management.

3. CROSS BORDER EDUCATION – IIRS PERSPECTIVE

The emphasis of IIRS – ITC JEP is conducting joint courses of Master of Science and postgraduate diploma programs in Geoinformatics and Geo-hazards on regular basis and the activities involving IIRS and ITC faculty conducting 18 months M.Sc. course (15 months at IIRS and 3 months at ITC). Course material of ITC and library resources are shared to conduct the program and updated on regular basis. The Master of Science program is accredited to Twente University, The Netherlands from 2010 and the course work is evaluated according to its procedures. The postgraduate diploma is entirely done at IIRS and ITC involvement is in pilot project work for the last three months of the program, mainly evaluating it. IIRS M.Sc. students visit ITC for course advance work and ITC faculty visit to IIRS for evaluation of both the courses.

3.1 Challenges and lessons learned

IIRS’s cross boarder international joint education program is most successful as it has taken care of academic sustainability, institutional sustainability and financial sustainability. The program undergone the tests of high quality set by ITC and has sustained to continue beyond two phases, beginning with financial support from ITC and the later phase i.e. IIRS – ITC JEP where both the institutions are equal partners without any financial support to run the program. IIRS is ready to continue the cross boarder education for further period / term reflecting the intension and commitments to successfully take it forward to the future. To begin with many difficulties and challenges are faced and transformed the difficulties into opportunities benefitting IIRS – ITC over the long run. The table lists out IIRS perspective on 1) the difficulties/challenges faced, 2) lessons learned and benefits gained with the support of International Cross Border Education between IIRS and ITC.

1. DIFFICULTIES / CHALLENGES FACED
<ul style="list-style-type: none"> ▪ Limited faculty to cover larger gamut of research areas ▪ Difficult to cope up with teaching / advanced research initially ▪ Limited research ability restricting students to be confined certain topics of research ▪ Visiting time limitations for IIRS faculty ▪ Difficult to cope with difference of education system ▪ Cultural differences ▪ Long administrative procedures ▪ Financial support exclusive for JEPs ▪ VISA difficulties ▪ Loosing of well trained faculty due to better opportunities outside IIRS.
2. LESSONS LEARNED AND BENEFITS GAINED
<p>The challenges were converted into opportunities with staff learning new areas of Geoinformatics such as Internet/Spatial Data Quality, Web GIS, Geo-data modelling, Spatial Information theory, research Skill Development and Geo-information management etc. Important lessons learnt and benefits gained are listed out:</p> <ul style="list-style-type: none"> ▪ Training of the trainers ▪ Improved quality of the course

- Systematic procedures for implementation of course curriculum and courses upgraded continuously
 - Improved research quality following Stringent standards thereby keeping the high quality research outputs
 - International exposure to students leading to higher studies / research
 - Fees exemption for government sponsored candidates
 - ITC faculty support for advances topics
 - Sharing of resources
 - Good Geoinformatics facility established
 - Sandwich PhD benefits to IIRS faculty
 - A step ahead compared to other institutes in India
3. Reputation of IIRS as a whole

Table 4. IIRS perspective on JEP

3.2 Beyond 2010 – Joint Education Program between IIRS – ITC

The present IIRS – ITC JEP is expected to be continued for the next five years i.e. 2010 – 2015 with new MOU in near future. The scope, of the JEP include overall Indian Space Research Organisation (ISRO) centre’s involvement with exchange of scientists for higher studies (i.e. research), joint research studies and organizing international conferences and workshops, in addition to continuation of current JEP programs.

4. CONCLUSIONS

IIRS has learned many lessons from the JEP and it was altogether different experience. Though we are successful in implementing the Cross Boarder JEP, there are many bottlenecks to resolve and challenges to achieve the targeted results. They are:

- Many new and advanced course geo-informatics and geo-hard topics are as part of Masters and postgraduate diploma programs.
- Majority of course work at IIRS, i.e. 15 months at IIRS and compared to limited time at ITC i.e. 3 months. It was major bottleneck at the beginning of the JEP due to stringent visa procedures for long duration of stay in The Netherlands.
- The master’s program involving strong component of research and due to which the student is highly pressurized to produce high quality outputs.
- Financial constraints for Indian students as compared to similar courses conducted at other universities and colleges. But it is good opportunity for foreign students as it is most economical to attend in India.
- Paradigm shift for IIRS from training to Education and difficulties due to pedagogical differences

IIRS has gained experience and enriched its knowledge from the JEP and it was altogether different experience. These programs are sustained even after the project funded phase, mainly due to the institute taking keen interest in continuation of the program, financial commitment and support of parent organization and willingness of ITC, The Netherlands to continue with Cross Boarder Joint Education Program.

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References shall enable a librarian to supply the quoted paper/book to the reader. References should be cited in the text, thus (Smith, 1987b; Moons, 1997), and listed in alphabetical order in the reference section, leaving a blank line between references (this is done automatically when using the provided Word template file). The following arrangements should be used:

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