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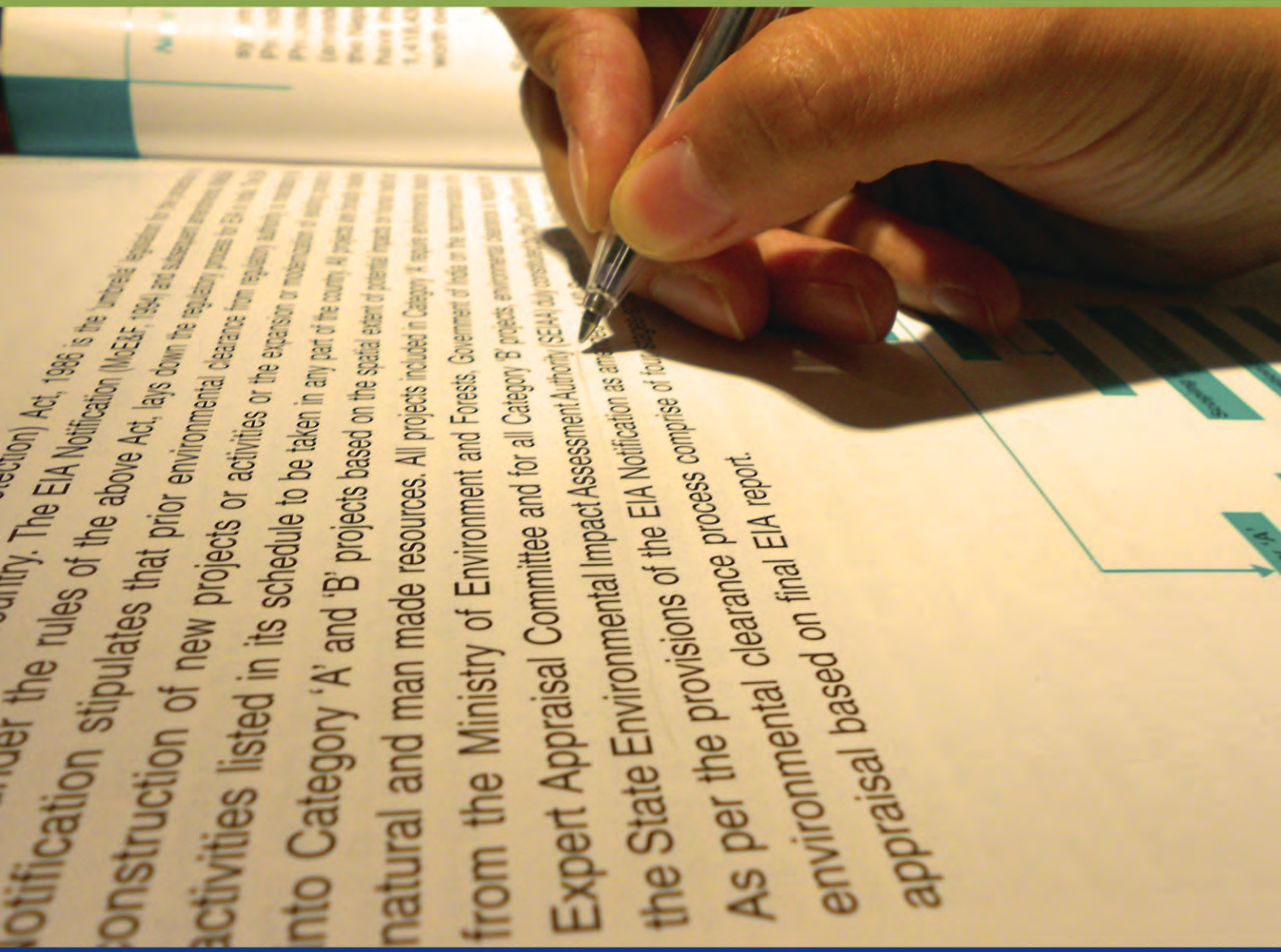
Netherlands Commission for Environmental Assessment

Development of an EIA Curriculum

for Tertiary Level Institutions in Pakistan

Baseline, Development Needs, Curriculum Outline and Suggestions for Further Action



National Impact Assessment Programme

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Table of Contents

Summary of Content

This report addresses the five objectives set for the NIAP assignment 'Development of EIA curricula for tertiary level academic and public administrations'. These include:

1. Identify strengths and weaknesses of existing EIA curricula being taught at Tertiary Level Institutions in Pakistan;

2. Support the development of EIA curricula for these institutions, taking international research and best practices into account;

3. Identify the feasibility of including SEA in the curriculum;

4. Prepare an action plan for implementation of different curricula; and

5. Advise on a comprehensive one week EIA training curriculum for public administration institutions.

Objectives 1 to 3 are addressed in parts 1, 2 and 3 of this report and objectives 4 and 5 in parts 3, 4 and 5. Part 1 summarises results of five baseline data collection exercises on EIA teaching at Tertiary Level Academic Institutions in Pakistan, revolving around the 'Improvement of EIA Curricula Tertiary Level Academic Institutions' Workshop in Islamabad, 13/09/2012. This involves describing and interpreting them, in the light of the assignment objectives. In part 2, results of a second workshop on 'Enhancing the relevance of EIA curricula in Pakistani higher education institutions – towards closer links with the public sector, industry and practice', also held in Islamabad on 05/11/2012 are reflected upon. Part 3 introduces the EIA curriculum outline, which includes SEA. Part 4 provides advice on comprehensive four-day EIA training curricula for public administration institutions and university teachers. In part 5, finally recommendations for further action are made. The Annex includes the questionnaires used[1] as well as an overview of the institutions contributing to it.

1. What is of particular importance here is that the current government is in the process of devolving responsibility for both the environment and education to the provincial level, with provincial EPAs in particular potentially obtaining an important role. Due to these changes, the role of the national Higher Education Commission (HEC) is uncertain. However, there are currently, no provincial higher education commissions in place.

1. Data collection exercises revolving around the 'improvement of EIA Curricula of Tertiary Level Academic Institutions' Workshop in Islamabad, 13/09/2012

Focal point of the collection of baseline data was the National Impact Assessment Programme (NIAP) workshop on the improvement of EIA curricula of tertiary level academic institutions in Islamabad on September 13th, 2012, which was attended by a total of 32 participants, including fifteen tertiary sector representatives, six Federal Administration officials (of which three were from the Planning Commission and two from the Ministry of Climate Change), six IUCN Pakistan team members, two national Environmental Protection Agency (EPA) members, one provincial EPA representative, one representative of the Dutch embassy in Pakistan and the author of this report.

Data for identifying the baseline and status quo, needs and the way forward for EIA teaching at Tertiary Level Institutions were generated based on:

1. A pre-workshop questionnaire survey with twnety representatives of tertiary level education institutions in Pakistan. Seventeen completed questionnaires, representing sixteen institutions were obtained, i.e. the response rate is 85%;

2. An initial anonymous workshop survey, using an audience response system (Genee World). Depending on the question, up to 21 workshop participants took part;

3. An evaluation exercise of an 'EA Lecturers' Handbook', which had been produced during an earlier European Commission Erasmus Mundus Project on environmental assessment higher education in Europe and Asia (See: www.twoeam-eu.net). Eighteen workshop participants completed an evaluation questionnaire;

4. Group work on three essential EA tertiary level education questions;

5. A short final survey, again using the audience response system. Depending on the questions asked, up to nineteen workshop participants took part;

6. A second workshop held on November 5th, 2012 in Islamabad on 'Enhancing the relevance of EIA curricula in Pakistani higher education institutions – towards closer links with the public sector, industry and practice'. Workshop participants included 46 experts, representing Tertiary Level Institutions, national and provincial EPAs, private sector representatives, the national Ministry of Climate Change and other NIAP partners. The results of this workshop are summarised in part 2 of this report; and

7. Some detailed reflections by nine EIA experts on a detailed second EIA curriculum outline, of which a draft had been introduced and commented upon during the second workshop and which had subsequently been developed further.

Overall, representatives of 24 Tertiary Level Academic Institutions contributed in one way or another to the various exercises. While ten public sector institutions and five private sector institutions which had previously been identified to offer EIA teaching in an IUCN survey and an earlier report prepared by Prof Irfan Khan (subsequently referred to as the 'previous report' – six additional institutions had contributed to that) on the 'Assessment of EIA curricula and institutional capacity of Tertiary Level Institutions' did not contribute, three institutions, that had not been previously identified, did. All institutions are presented in annex 1. Subsequently, first results of points 1. to 5. are presented. Then, an overview of the 2nd workshop is provided and the EIA curriculum outline is introduced.

1.1 Pre-workshop questionnaire survey

The pre-workshop survey consisted of a number of questions on the way and the extent to which EIA is taught, the teaching techniques used, the topics covered and the teaching materials (e.g. textbooks and other sources) used. The questionnaire is presented in Annex 2. Seventeen academics completed the survey, as follows:

1. Abdul Rashid Memon, Civil Engineering Department, Mehran University;

2. Dr Iftikhar Ahmad, Earth and Environment Sciences College, Punjab University, Lahore;

3. Mehwish Jamil Noor, Environment Sciences Department, Fatima Jinnah Women University;

4. Kishan Chand (Mukwana), Energy and Environment Engineering Department, QUEST, Quaid e Awam Engineering University;

5. Muhammad Umar Hayyat, Lecturer, Sustainable Development Study Centre, Science and Tech Faculty, GC University Lahore;

6. Fiza Sarwar, Lecturer, Earth and Environment Sciences Department, Bahria University;
7. Dr Zuhaib Siddiqui, Environment Engineering Department, NED University of Engineering and Technology, Karachi;

8. Dr Farhat Abbas, Environment Sciences Department, Government College University;

9. Dr Audil Rashid, Environment Sciences Department, PMAS Arid Agriculture University;

10. Prof Dr Irfan Khan, Environment Sciences Department, International Islamic University;

11. Dr Obaidullah Nadeem, City and Regional Planning Department, University of Engineering and Technology, Lahore;

12. Amina Zafar, Lecturer, Environment Science Department, Lahore College for Women University;

13. Prof Dr Mansoor Imam, Civil Engineering Department, Sir Syed University of Engineering and Technology, Karachi;
14. Prof Dr Rizwan Hameed, City and Regional Planning Department, University of Engineering and Technology, Lahore;

15. Prof Dr Amir Haider Malik, Environment Sciences Department, COMSATS, Abbottabad;

16. Zahoor Ahmad Bazai, Director, Faculty Training and Development Centre, University of Balochistan*; and

17. Rabia Zafar, Environment Sciences Department, SBK Women's University.

Overall, the sixteen universities represented by the seventeen respondents were found to offer 30 degree programmes in which EIA was taught. Of the sixteen universities, four were offering three degree programmes, six were offering two degree programmes and another six one degree programme each. Of the 30 degree programmes offered in this, fifteen were undergraduate and fifteen post-graduate degree programmes. In total, 35 courses in which EIA is taught were offered. Of these, 29 courses had three credit hours, four courses had four credit hours and one course had two credit hours. Furthermore, one course was offered, where the EIA part was said to represent less than one credit hour. Only some respondents specified the split between theoretical and practical work. Of those courses that were specified, nine were found to be of a 2-1 credit hour nature, four of a 3+0, three of a 3+1 and one of a 2+0 nature. Most post-graduate degree programmes lasted two years (one each lasted 1, 2.5 and 3 years). All undergraduate degree programmes lasted four years.

In terms of time spent on practical work, this survey suggests that there may be a somewhat more positive situation than what the previous report had indicated. A substantial amount of practical work appears to be conducted in many institutions teaching on EIA already[2]. Also, the information provided by those institution offering 2-0, 3-0 and 4-0 courses indicates that those, too, were offering practical components, e.g. mock EIA exercises, group work, seminars. Figure 1 shows those teaching techniques mentioned by survey respondents. NB: While only fourteen out of seventeen were explicitly saying they were using written exams, following HEC requirements, all are supposed to employ them.

Figure 1: Teaching techniques used in seventeen institutions

2. Taking both, the results of the previous report and this survey into account, the following ten institutions are offering 2-1 or 3-1 courses: University of Sargodha, GC University Lahore, University of Gujrat, Punjab University, Lahore College for Women University, University of Karachi, Mehran University, SUPARCO Karachi, Bahria University Karachi and International Islamic University Islamabad.

Regarding the extent of EIA teaching in the 35 courses, in eleven institutions, EIA was said to be covered in one course only in any one programme and in five institutions, EIA was said to be covered in more than one course (usually two). Furthermore, in one institution EIA was said to be dealt with in six 50-minute lectures. NB: A three credit hour course makes up about one-tenth of a 2-year post-graduate programme of 30 credit hours or one-thirtieth of a 4-year undergraduate degree programme of 120 credit hours. Representatives of six institutions said that EIA coverage can be extended further through e.g. specific individual coursework or related dissertations. There is currently no institution offering a dedicated EIA degree programme.

Eleven institutions were offering EIA related courses in both, undergraduate and postgraduate degree programmes. Furthermore, three institutions each were either offering a post- or an undergraduate degree only in which EIA related courses were offered. While in undergraduate degree programmes, EIA courses were taught mostly in years 3 and 4, there was no clear pattern emerging for post-graduate degree programmes.

The key literature used in teaching EIA was mostly UK- and US-based and there were no Pakistani text books available (See: Table 1). The only Pakistani literature mentioned was either legislation or guidance. The extent to which EIA teaching relies in particular on UK and US textbooks is problematic, as these reflect specific national approaches and traditions. These are not replicable elsewhere without adaptation. It is, therefore, recommended that other types of publications be used that deal with Pakistani practice (e.g. academic papers). Furthermore, there is clearly a need for a Pakistani textbook on EIA.

Figure 2: Extent of EIA teaching in seventeen institutions

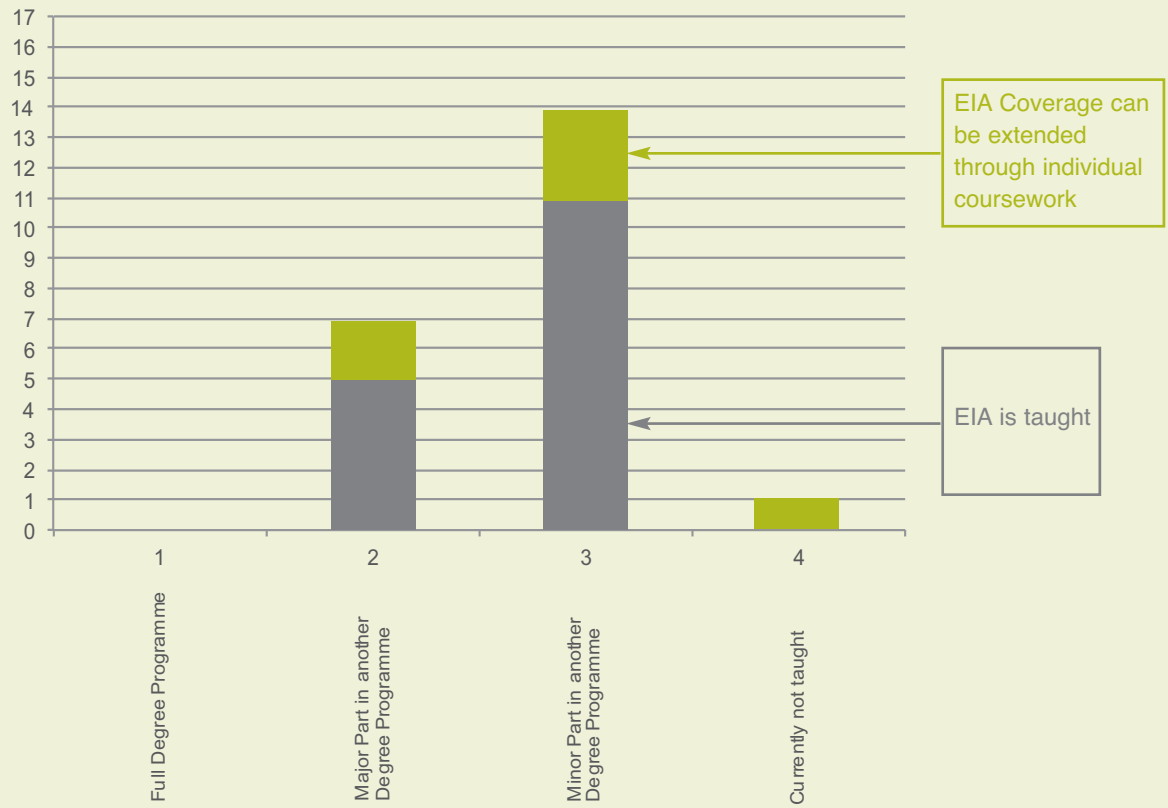


Table 1: Key literature used in EIA teaching

Title	*Used by*
Glasson J, Therivel R and Chadwick A since 1994. Introduction to EIA, London, UCL Press (UK)	10
Canter L 1996. EIA, New York, McGraw Hill (US)	4
Pakistan Environmental Protection Agency (Review of IEE & EIA) Regulations 2000/2001 (Pak.)	4
Harrop D O and Nixon J A since 1998. EIA in Practice, Routledge (UK)	3
Pakistan Environmental Protection Agency Sectoral Guidelines for EIA 2001 (Pakistan)	3
Pakistan Environmental Protection Act 1997 (Pakistan)	2
UNEP EIA Training Resource Manual 2002 (International)	2
• Carroll B and Turpin T 2002. EIA Handbook, Thomas Telford (UK)	each used by 1
• Holling C S 2005. Adaptive EA and Management, International Institute for Applied Syst. Analysis (US)	institution
• Petts J 1999. Handbook of EIA, Blackwell, Oxford (UK)	
• Barrow CJ 1997. Environmental and Social IA, Hodder Education Publishers (UK)	
• N Munier 2004: Multi-criteria Environmental Assessment, Kluwer Academic Pub. (Canada)	
• Lerche I and Paleologos E K 2001: Environmental Risk Analysis, McGraw-Hill. (US)	
• Eccleston C H 2011. EIA – a guide to best professional practice, C&C Press (US) Morris O and Therivel R 1995: Methods on EIA: 1 (UK)	
• Asian Development Bank EIA manuals (Asia)	
• EIA: Guidelines by the Government of Pakistan 1986 (Pakistan)	

The pre-conference survey was also looking at the extent to which a total of 35 EIA related topics were covered in current EIA teaching (compiled from Sanchez and Morrison-Saunders (2010), as well as from Fischer et al. (2008). Here, respondents were asked whether topics were (1) well covered, (2) covered, but not well, (3) currently not covered, but need to be covered, (4) should be (better) covered, and (5) are not essential.

Figure 3 shows what topics are currently either well covered or currently covered, but not well. All institutions cover the topics 'legislation', 'theory', 'process', 'social' and 'cultural' issues, even though with all those some say they are not covered well. Topics that are covered in at least thirteen of the sixteen institutions (i.e. 80%) include 'guidance', 'history of EIA', 'alternatives', 'cumulative impacts', 'public participation', 'impact significance', 'mitigation', 'environmental planning', 'environmental management', 'environmental science', 'SEA', 'biophysical aspects', 'health aspects', 'economic aspects' and 'sustainable development'. Again, while all of these aspects were covered, a significant number were thought to be not covered well (in the cases of 'alternatives', cumulative impacts' and 'SEA' nearly half of the respondents said this was the case).

On the other hand, seven or fewer institutions (i.e. less than about 40%) covered 'overlay mapping', 'uncertainty', 'multi-criteria analysis', 'environmental economics', environmental engineering' and 'modelling'. Regarding the latter, none said the topic was covered well, and only two said this was covered at all.

Topics that were covered by between 40% and 80% of the institutions included 'life-cycle assessment', 'environmental integration',

development planning', 'dealing with trade-offs', 'organisational behaviour', 'environmental economics', 'GIS' and 'indicators'. What is somewhat surprising about these findings is that a significant number of what are more technical issues (e.g. specific prediction techniques) were covered less well than what might be expected from science and engineering departments/faculties. While it might be the case that some technical knowledge is taught in other courses, there is clearly a need to make connections with what is taught elsewhere and EIA clear.

Figure 4 shows what topics representatives from the sixteen institutions thought needed to be covered or should be better covered. There is a close (inverse) fit with Figure 3. Representatives of over eight (i.e. 50%) of the institutions thought that that there was a particular need to cover (better) 'overlay mapping', 'life-cycle assessment', 'uncertainties' 'multi-criteria analysis', 'modelling', 'environmental economics' and 'environmental politics'. Again, the high number of more technical topics is somewhat surprising. Other topics where representatives of at least five institutions (i.e. about 30%) thought that (better) coverage was needed include 'cumulative impacts', environmental integration', 'trade-offs', 'organisational behaviour', 'GIS', 'ecology', 'environmental engineering' and 'indicators'. The science and engineering nature of many of these confirms that there may be scope for linking up closer or better with courses taught elsewhere in the degree programmes within which EIA is taught. Furthermore, in some institutions there should be an increased effort in teaching decision making and its political nature and implications.

Figure 3: Topics covered in EIA-related teaching

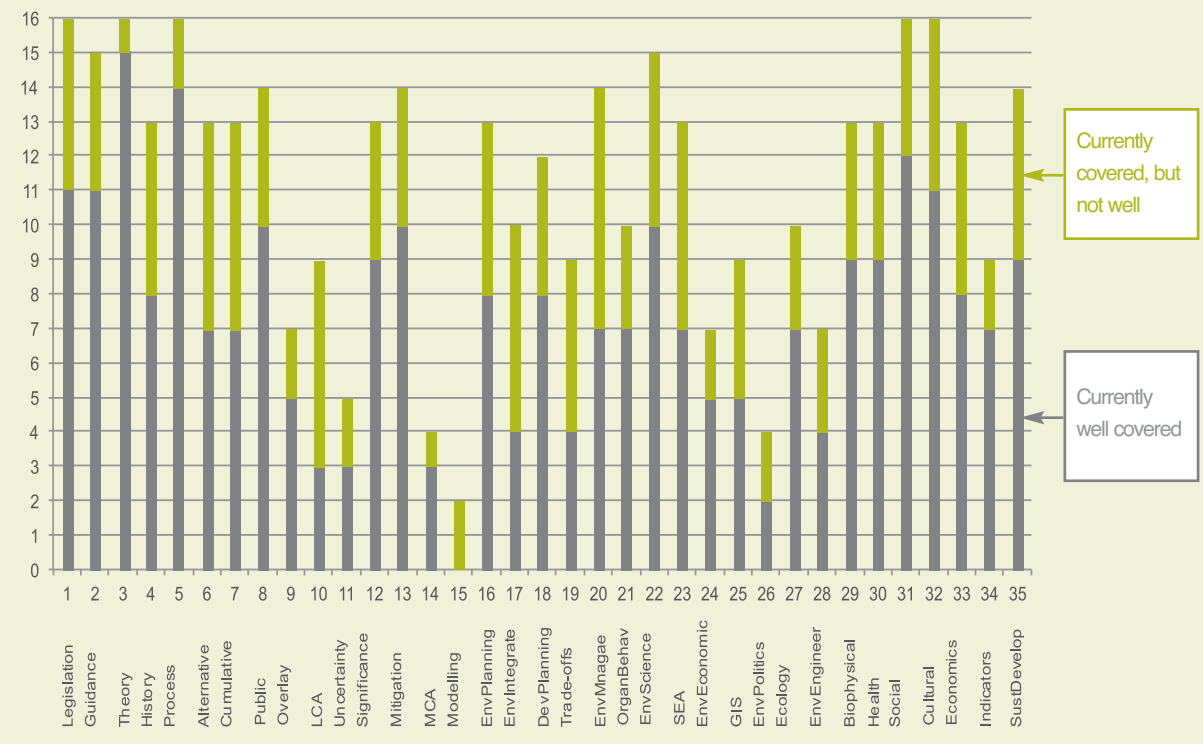
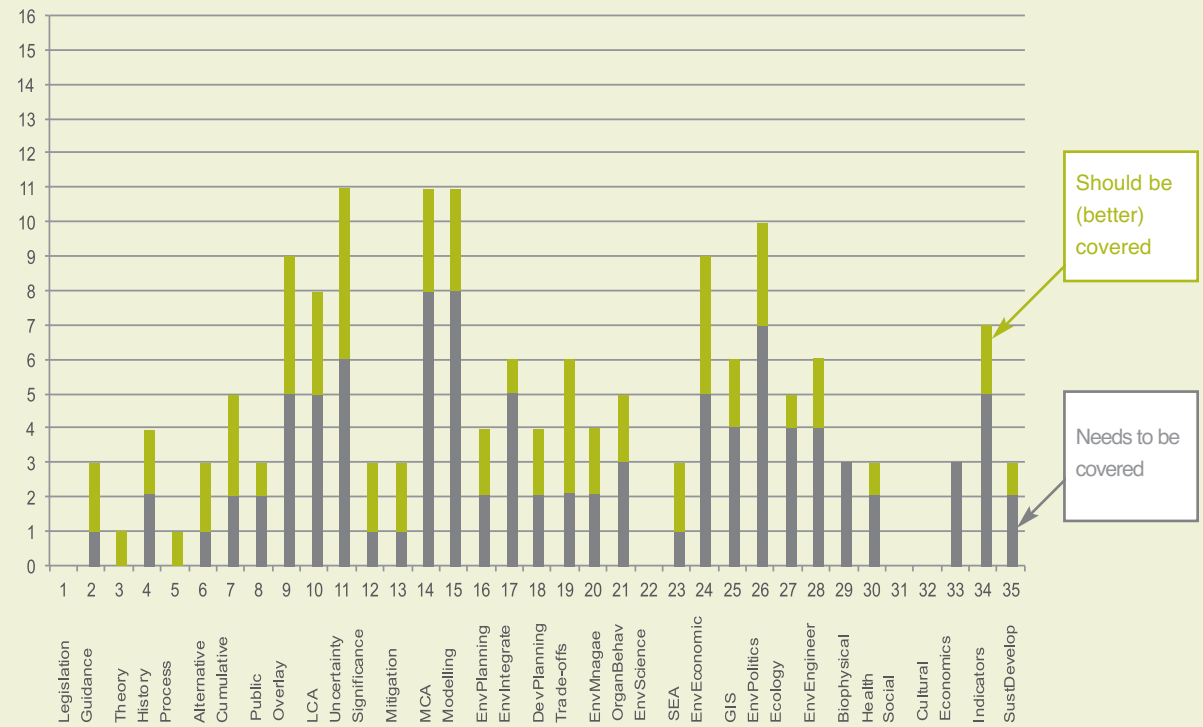


Figure 4: Topics that need to be covered or should be (better) covered.



Only a very few topics were deemed to be not essential by a small number of survey participants. Topics that one respondent only, marked as being not essential include 'alternatives', public participation', 'life-cycle assessment', 'multi-criteria analysis', 'environmental planning', 'environmental integration', 'trade-offs', 'biophysical aspects', 'health', 'economics' and 'indicators'. Aspects that two respondents considered not essential include 'development planning', 'environmental management', 'organisational behaviour', 'environmental science', 'environmental economics', 'GIS' and 'ecological aspects'. Only two topics were found to be not essential by three respondents each, including 'modelling' and 'environmental politics'. 'Environmental engineering' was the only topic not considered essential by four respondents (25%). It is important to underline that while many of these aspects would be considered 'essential' in the professional literature, the three aspects in the latter two groups would probably not be routinely taught in EIA courses, at least not in great depth. Overall, however, the reply of one or two out of sixteen respondents cannot be considered significant and wider conclusions cannot be drawn.

When asked what aspects of importance were not included in the list, respondents mentioned 'environmental risk assessment' (2), 'writing skills' (3), 'national EIA practices', 'sectoral and regional EIA practices', 'relationships between actors in the process', 'post EIA monitoring/auditing' (6), 'international conventions and protocols', 'EIA project and data base management', 'trans-boundary impacts' (2), 'role of sponsors / donors', 'compensation and re-settlement plans', 'practical work, study tours, site visits and participation in hearings', 'analytical hierarchy process (AHP)', 'internships', 'evaluation/review of reports', 'checklists', 'matrices', 'networking', and 'costs and benefits of EIA'.

Respondents also provided some useful statements when asked what they thought was of particular importance for teaching EIA in Pakistan, as follows:

- Students should be encouraged to do EIA practically in the field (mentioned by 2);
- There is currently inadequate expert knowledge in the EIA field and university education plays a crucial role to amend this (mentioned by 2);
- Monitoring needs (see above section);
- Moral and ethical aspects, and in this context religious consideration, which are given to almost everything in Pakistan;
- At least one university to offer dedicated EIA/SEA degree programmes at undergraduate and postgraduate levels (mentioned by 2);
- Training teachers;
- Establishing links with developed countries;
- There is currently a gap between academia, consultancies and the government;
- Engineers don't know EIA well;
- Weak enforcement and lack of technical assistance;
- EIA should be a compulsory subject in all environmental sciences degrees; and
- Bridging the theory-practice gap is important.

1.2 Initial workshop survey, using the audience response system

In this section, the results of the survey conducted at the beginning of the workshop are presented. Using an audience response system, respondents were able to express their opinions in an anonymous fashion on a total of 31 questions. Table 2 shows the workshop agenda and Table 3 shows the attendance sheet of the workshop. In the last column, the numbers 1-15 indicate higher education representatives who took part in the whole survey. Furthermore, the crosses indicate those workshop participants who were responding to certain questions only. These were mostly government and EPA officials.

The first few questions dealt with teaching experiences. Most of the fifteen representatives of Tertiary Level Institutions were themselves involved in teaching, with a few representing the main EIA teachers of their institutions. It was not only the Tertiary Level Institutions' representatives, who had teaching experiences, but also a few of the other survey participants. Survey results indicate that some of these were or had been teaching (or conducting training) in either their respective institutions or in universities before joining government institutions. When asked about the length of their teaching experiences, out of nineteen who responded, eighteen indicated they had some experiences, ranging from '1 to 3' to 'over 10' years. Figure 5 shows that there were some very experienced teachers in the audience; with six saying they had '4-6' years, five '7 to 9' years and three even '10 years or more' of EIA teaching experiences.

Table 2: Workshop Agenda

National Impact Assessment Programme
Improvement of EIA Curricula of Tertiary Level Academic Institutions
EIA teaching in Pakistan
Islamabad, September 13th, 2012

Agenda Time	*Activity*	*Facilitator/Presenter*
08:30 – 09:00	Registration of participants	
09:00 – 09:05	Recitation from Holy Quran	
09:05 – 09:10	Welcome remarks	Hamid Marwat, NPD/NIAP
09:10 – 09:20	Recap of curricula review under NIAP/ workshop objectives	Ahmad Saeed, Project Manager, NIAP
09:20 – 09:30	Workshop objectives/ Curricula development process	Dr. Thomas Fischer, University of Liverpool/ Consultant
09:30 – 09:40	Remarks by the chief guest	Mohammad Javed Malik, Secretary Planning and Development Division.
09:40 – 10:00	Tea/ coffee break	
10:00 – 10:10	Introduction to the day	Dr. Thomas Fischer
10:20 – 11:00	Initial ad-hoc survey of participants on EIA teaching in Pakistan (strengths and weaknesses)	Dr. Thomas Fischer; All participants actively involved
11:00 – 11:30	Assessment of EIA curricula and institutional capacity of tertiary level institution in Pakistan	Dr. Muhammad Irfan Khan
11:30 – 11:50	EA lecturer's handbook: an introduction	Dr. Thomas Fischer
11:50 – 12:35	Evaluation of EA lecturer's Handbook from a Pakistani perspective (all participant are given a handbook and questionnaire)	Dr. Thomas Fischer (assisted by Dr. Irfan Khan); All participants actively involved
12:35 - 13:00	Short feedback session on exercise	All participants (+Dr. Thomas Fischer)
13:00 – 14:00	Lunch break	
14:00 – 14:20	Environmental Assessment related master level higher education in the EU: an overview (including subjects taught)	Dr. Thomas Fischer
14:20 – 14:40	Subjects covered in EIA related teaching in Pakistan: Results of a survey	Dr. Thomas Fischer
14:40 – 15:10	Tea/ coffee break (we can also have a working tea)	
15:10 – 16:00	Group work: teaching EIA in Pakistan- what is needed	All participants
16:00 – 16:30	Presentation of group work results	Group rapporteurs and presenters chosen by each group
16:30 – 16:45	Reflecting on group work results and the day and the way forward	Dr. Thomas Fischer
16:45 – 17:00	Final remarks and conclusion	Ahmad Saeed

Table 3: Attendance sheet of workshop

ATTENDANCE SHEET

NATIONAL IMPACT ASSESSMENT PROGRAMME

Improvement of EIA Curricula of Tertiary Level Academic Institutions:
EIA teaching in Pakistan
Marriott Hotel, Islamabad
September 13, 2012

S. #	Name	Organization	Contact	Signature
1.	Muhammad Javed Malik	Secretary, Planning & Development Division	9206444	
2.	Ghulam Mohayuddin Marri	Member (Infrastructure), Planning Commission	051-9202616	
3.	Nazia Zakir Ahmed	Planning Commission /IUCN	-	
4.	Abdul Rashid Memon	Mehran University	0300-3023876	1
5.	Dr. Zuhaib Siddiqui	NED UET, Karachi	0333-3268816	2
6.	Dr. Farhat Abbas	GC University, Faisalabad	0332-6765229	3
7.	Muhammad Umar Hayyat	GC University Lahore	0321-4032300	4
8.	Mr. Abdul Hamid Marwat	Planning Commission	0300-5248655	X
9.	Dr. Amir Haider Malik	COMSATS, Abbottabad	0300-5811639	5
10	Mr. Zahoor Ahmad Bazai	University of Balochistan	0333-7939320	6
11	Dr. M. Anwar Baig	NUST, Islamabad	051-90854300	7
12	Engr. Kishan Chand	QUEST –Nawabshah	0314-2810129	8
13	Dr. Obaidullah Nadeem	UET Lahore	0300-4356564	9
14	Prof. Shafique Rehman	University of Peshawar	0300-5833796	10
15	Ms. Arfa Zaheer Azmat	IUCN		
16	Dr. Rizwan Hameed	UET Lahore	0323-4319731	11
17	Dr. Thomas Fischer	Uni of Liverpool		
18	Ms. Fiza Sarwar	Bahria Uni, Isb	0334-9270902	12
19	Dr. M.Irfan Khan	Islamic International University	0300-9779205	13
20	Ms. Rabia Zafar	Sardar Bahadur Khan Women University, Quetta	0333-7920679	14
21	Mrs. Yasmin Jawed Khan	Embassy of the Kingdom of Netherlands	0300-5106333	
22	Ms. Aden Khan	NIAP Pak-EPA		X
23	Ms. Amina Zafar	LCWU,Lhr	0322-4200656	15
24	Mr. Ijlal Hussain	NIAP-EPA	0344-5227414	X
25	Mr. Mansoor Khan	NIAP/ Ministry of Climate Change	0321-4882159	X
26	Ms. Zia ul Islam	Ministry of Climate Change	9245624	X
27	Mr. Irfan Ahmed	IUCN	0333-3061246	
28	Ms. Hadia Khan	IUCN		
29	Ms. Ayesha Wasti	IUCN		
30	Mr. Sohail Islam	IUCN	0304-8675443	
31	Mr. Azfar Hassan Ansari	IUCN	0300-5130267	
32	Mr. Nasim ur Rehman	Environment Protection Department, Punjab	0301-4239537	X

NB: 1-15 = higher education representative; x other survey participant

1.2.1 Staff involved in EIA teaching

There were eighteen responses to the question on how many staff were involved in EIA teaching. As there were only fifteen tertiary sector representatives, other workshop participants were also involved or had been involved in teaching. Seven each said that there were either only one, or two to three persons involved. Furthermore, two each said that either four to five or more than five persons were involved in EIA teaching. These results are in line with other institutions teaching EIA internationally, where only a very few staff members are engaged with EIA education.

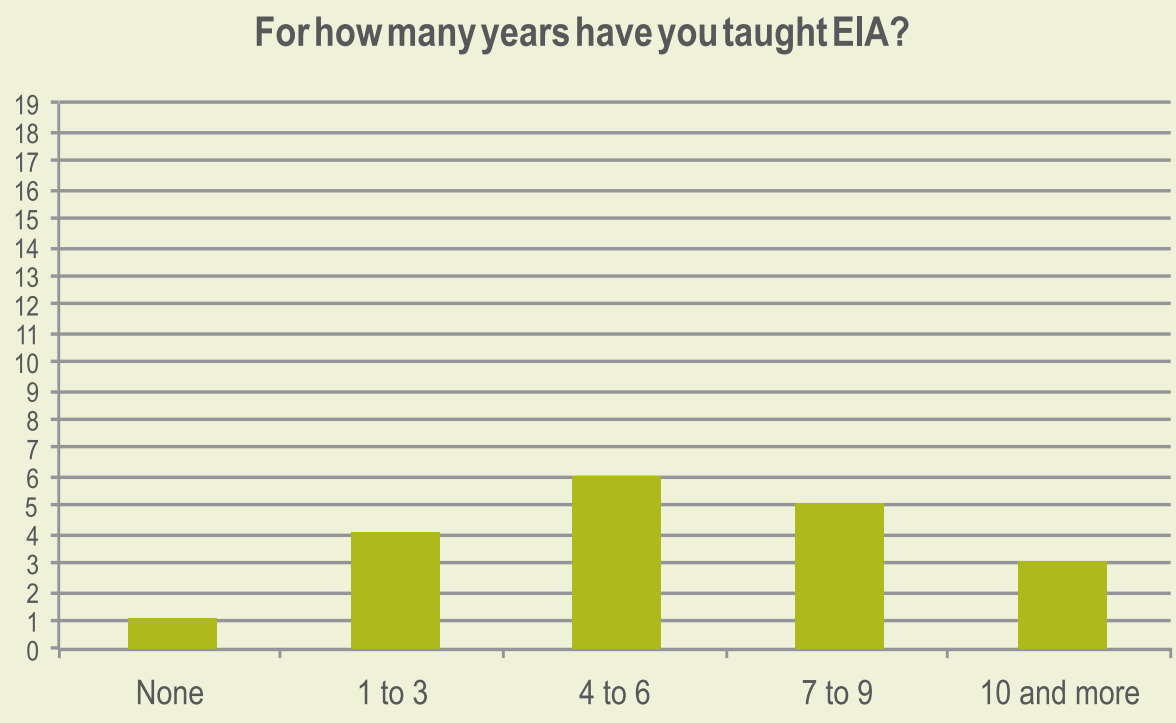
1.2.2 Disciplinary background and Alma Mater of EIA teachers

While twelve of nineteen respondents said they had either science (8) or engineering (4) degrees, six had degrees in both, science and engineering related subjects as well as social science / management related subjects. Only one respondent had a social science degree (not management). This reflects the engineering and science focus of EIA education in Pakistan.

Fifteen workshop participants specified what disciplines are represented by EIA staff members (Figure 6). While ten said that these were representing natural science and engineering only, five mentioned social science, three of which saying that there was also management expertise.

Regarding the place of university education (i.e. alma mater), an equal number of respondents (i.e. there was a fifty-fifty split) said they held degrees from (1) Pakistani institutions and (2) overseas institutions from North America, Europe or Australia. A very similar picture was emerging when asked where EIA teaching colleagues did their degree. There is thus a high degree of exposure to Tertiary Level Institutions from elsewhere in the world with an international knowledge base accumulated amongst EIA teachers in Pakistan.

Figure 5: Question on length of EIA teaching experience



1.2.3 Experiences with involvement in EIA practice

Regarding an involvement in real life EIA practice, thirteen out of nineteen respondents said they had been involved in real life EIAs as both, stakeholders or general members of the public and in organising parts of an EIA process. One each had done either of the above. Only four had not been involved in any real life EIAs but had studied related documentation. This is an indication that practical experiences may not be as limited as suggested in the previous report.

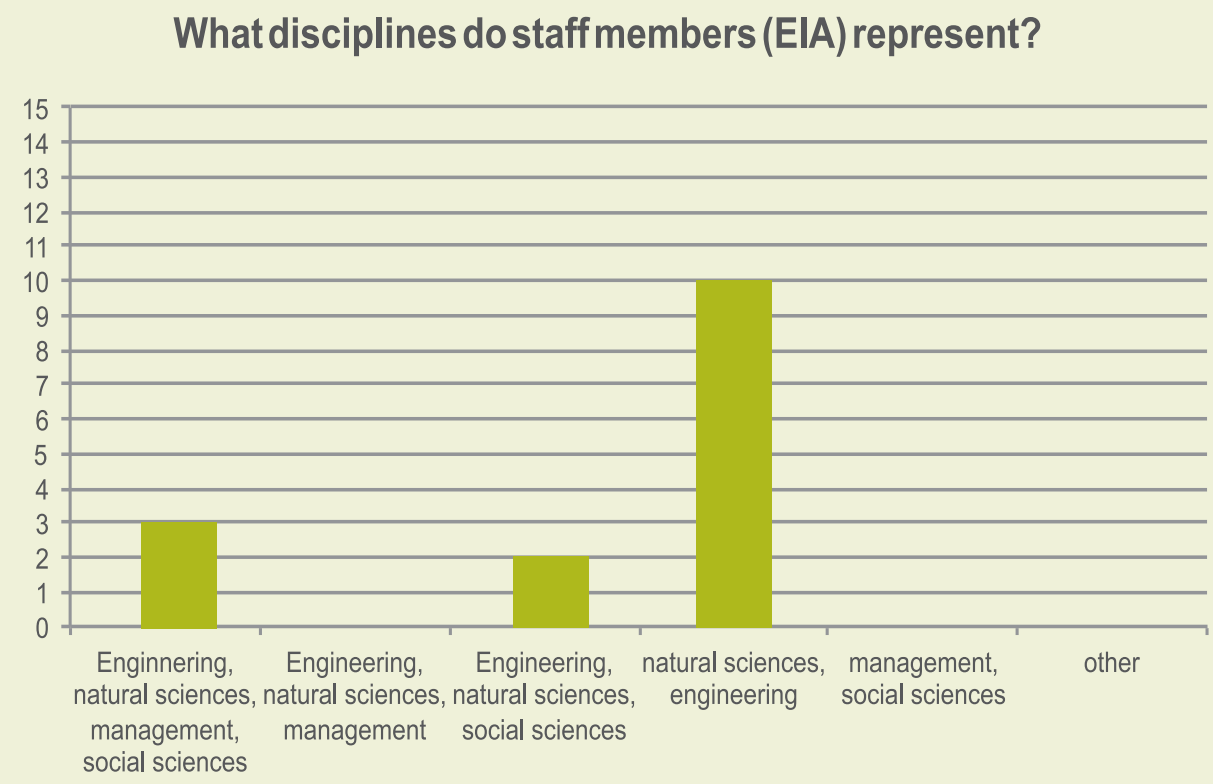
1.2.4 Focus on current EIA teaching, strengths and weaknesses

That potential experiences may not be as limited as thought is also confirmed by replies of workshop participants to the question on what their main focus of EIA related teaching is. Only one out of eighteen said that this was lecturing alone, while two each said that either seminars or practical work was the main focus of teaching. Thirteen stated that practical work was part of the main focus in their teaching activities, i.e. there clearly is an emphasis on practice, not just theory.

Further evidence for EIA practice being of great importance in current teaching was obtained when workshop participants were asked about teaching strengths and weaknesses (Figure 7). While practice along with science and engineering was perceived more of a strength than a weakness, theory and social science were largely perceived as weaknesses.

Theory was seen by most workshop participants (thirteen out of seventeen) as the main shortcoming of EIA teaching materials. Only three thought the main shortcoming was practice related and only one thought there weren't any shortcomings at all. In line with this, fifteen out of nineteen workshop participants thought that the EA literature did not provide them with everything they needed. While this indicates that the theory element in particular needs some close attention, this does not mean that the connections made with practice are satisfactory. It rather suggests that the literature does currently cover practice to a greater extent than (Pakistan relevant) theory. In this context, it is important that slightly more participants actually saw creating better

Figure 6: Question on disciplines represented by staff members



connections with real practice as more urgent than creating better teaching materials, even though overall the latter was still seen as a priority. Furthermore, eighteen out of 21 respondents saw the creation of truly international textbooks (i.e. textbooks that are not dominated by theory and practice form a certain country or system; See: Table 1) along with national or regional textbooks as being particularly urgently needed. All workshop participants stated that EIA needs to be adapted to national circumstances. In line with this, sixteen out of 21 respondents stated that EIA teaching did not currently cater for the needs of practice. While five said that it was at least partly achieving this, none said it was fully doing so.

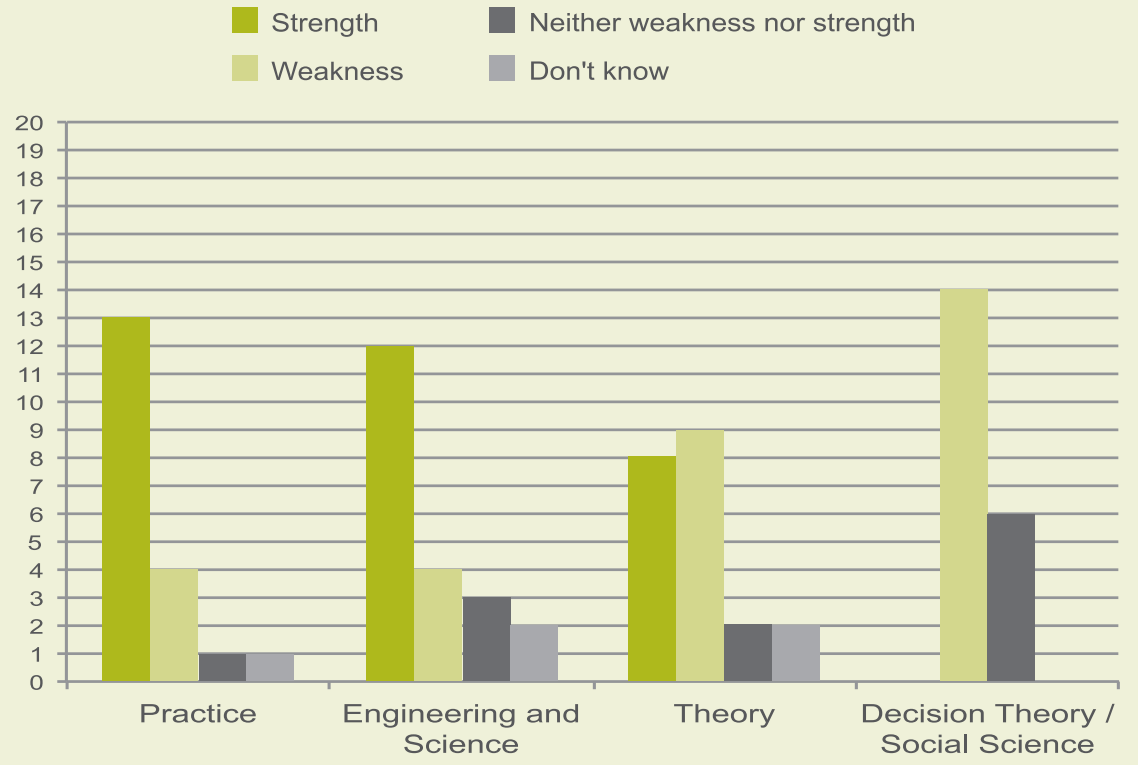
1.2.5 EIA Research

Thirteen out of twenty respondents stated that they had done research on EIA themselves and one said other staff had. While four had also published in the professional literature, six stated they had not done any research. Compared with the international academic community, a percentage of 20% of tertiary sector teachers having actually published in the professional literature can be considered low. With nearly 70% having done research, an emphasis should be on encouraging publishing, in particular as the EIA literature with regards to Pakistani experiences is perceived by so many as being deficient .

1.2.6 Disciplinary home

Workshop participants weren't quite sure what the disciplinary home should be for EIA teaching. While six out of twenty respondents said that this should be Science and Engineering (i.e. where it is now), fourteen stated that they weren't sure it should be taught within a specific discipline. None said that the disciplinary home should be in social science or economics or in an interdisciplinary manner. EIA teaching could be extended beyond science and engineering to other disciplines. This would be in line with practice in most other countries in the world (see www.twoeam-eu.net). The main disciplinary home, however, is likely to remain science and engineering.

Figure 7: Strengths and weaknesses of EIA teaching



1.2.7 HEC EIA curriculum and training of EIA teachers

Regarding the HEC EIA curriculum, only one out of 18 stated that they actually followed it, while five said that they followed it at least in parts. Six said either 'no', or that the EIA curriculum was not applicable to the degree being offered. Interestingly, while no respondent thought the HEC curriculum provided for everything that was needed, fifteen thought that it was providing for a good overall framework. Six stated that the curriculum only covered parts of what is important. This indicated that on one hand the HEC EIA curriculum should extend beyond the current disciplinary reach, and that it could be extended further, on the other. Sixteen out of 21 respondents thought there were insufficient training opportunities for EIA teachers, with three saying these were sufficient but not taken up. One was of the opinion that there were sufficient training opportunities and one did not know.

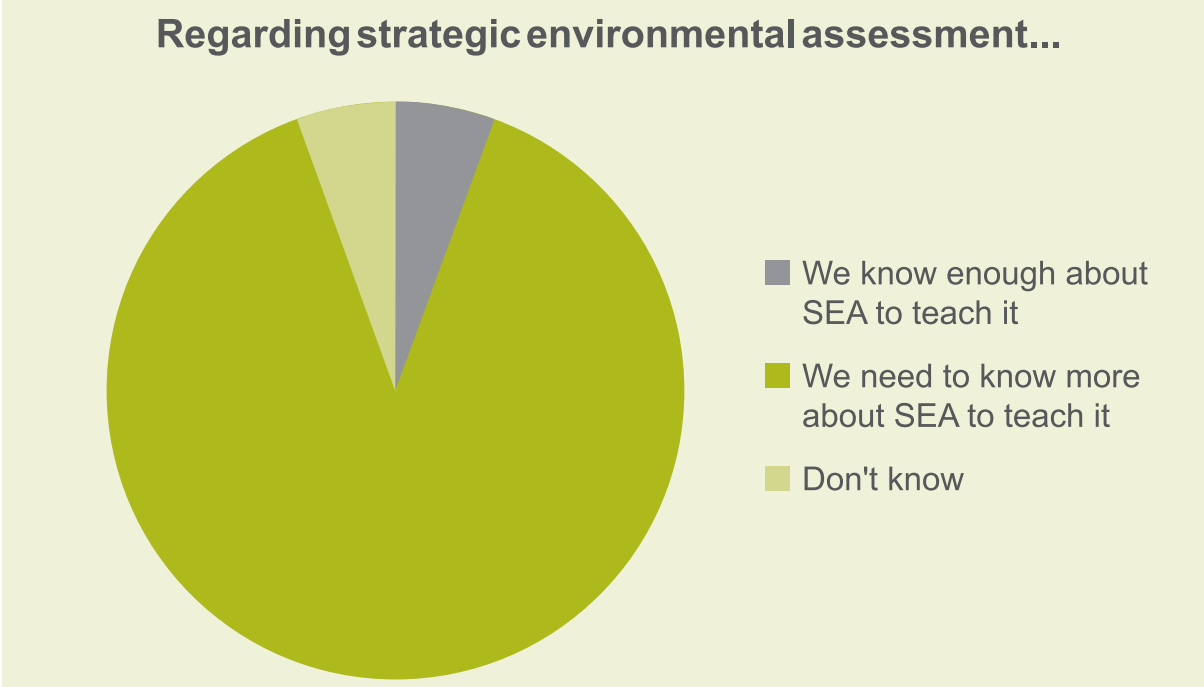
1.2.8 On strategic environmental assessment

While sixteen out of eighteen respondents were of the opinion that 'we need to know more about SEA to teach it', one thought that enough was already known (Figure 8). Furthermore, one did not know how to answer this question. This provides some strong support for the need to increase both, SEA specific publications and related training in Pakistan. One SEA case study from Pakistan was explicitly mentioned; the undergraduate level research project 'consideration of sustainability aspects in the integrated Master Plan for Lahore – 2021'.

1.2.9 EIA related degree programmes - the way forward

When asked what was particularly urgently needed for improving tertiary level EIA higher education, eight out of eighteen said that both, curricula within current programmes should be improved and specific EIA degree programmes should also be offered. While five workshop participants said that curricula within current programmes should be improved, two thought that offering specific EIA programmes was of particular urgency. Of those three that said

Figure 8: Is there sufficient knowledge of SEA for teaching it?



something else was needed, the link with practice was seen as being particularly crucial. Making the curriculum specific to Pakistan and connecting with the international community was identified as a priority by fifteen out of twenty respondents.

Of the remaining five participants, three put an emphasis on specific curricula for Pakistan and two on better connections with the international community.

1.2.10 Two general questions on EIA in Pakistan

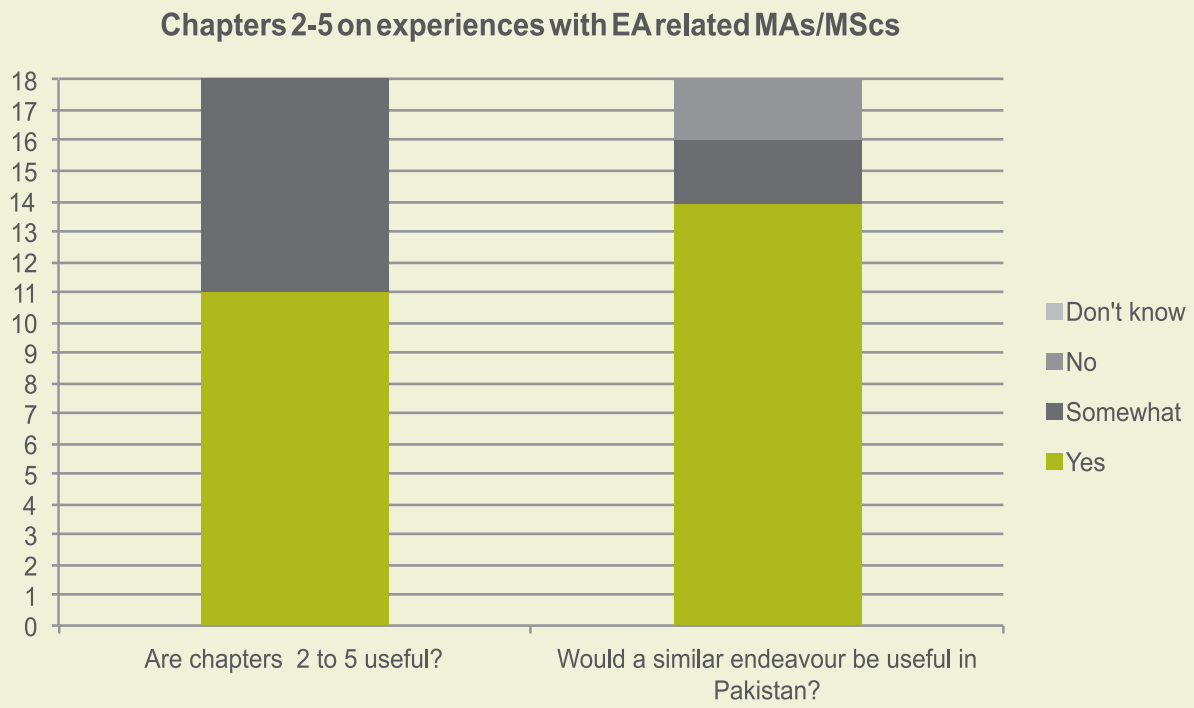
When asked what the major problems of EIA in Pakistan were, thirteen out of twenty respondents thought that poorly (or 'wrongly') educated practitioners were partly to blame. The other seven put an emphasis on poor technical knowledge and databases and poor implementation. Furthermore, while four out of twenty respondents thought EIA was an effective instrument in Pakistan, fourteen thought it was at least partly so. Only two thought it was not. This latter finding is particularly encouraging, as the general mood was clearly positive. This is an important ingredient for an effective EIA system.

1.3 Evaluation of EA lecturers' handbook

In order to gather further empirical evidence for what an EIA curriculum for Tertiary Level Institutions in Pakistan may look like, workshop participants were asked to evaluate the EA Lecturers' Handbook (Fischer et al, 2008), one of the outcomes of the European Commission (EC) Erasmus Mundus PENTA Project, conducted between 2006 and 2007.

In this handbook, a curriculum for a 'common' masters level degree programme in EA is introduced, outlining the content of five core modules. This curriculum is based on an analysis of 60 masters level degree programmes in nine EU member states. The rationale is that depending on the specific discipline and faculty the degree programme was offered in, other modules would be added.

Figure 9: Usefulness of part 1 of the Handbook



The Handbook consists of three main parts and eighteen chapters. In part 1, experiences, current practices and prospects of EA related masters programmes in the EU are outlined in four chapters. These cover aspects of internationalisation and harmonisation efforts of degree programmes; experiences with an established MA in EIA and some critical reflections on EA teaching in the context of postgraduate environmental courses. Furthermore, results of an analysis of EA related masters degree programmes in the EU are presented as the basis for the five core courses for a masters level degree in environmental assessment.

In part 2, the content of the five core courses is outlined, including course structures along with some comprehensive sets of references to the professional literature. This covers the following course topics:

1. Environmental assessment;
2. Principles for environmental integration;
3. Environmental management systems;
4. Ecological and environmental economics; and
5. Organisational behaviour and public decision-making.

In part 3, key sources for some fundamental EA issues are provided in eight chapters which revolve around:

(a) issues relating to context and effectiveness; and

(b) issues relating to the EA process, including procedural stages, methods, participation and follow-up.

The main purpose of the Handbook is to support university lecturers in setting up and teaching EA related masters programmes. While in this context, a European perspective is most prevalent, the materials provided can also be used in a wider international context; for this purpose, non-European authors also contributed to writing the Handbook.
An important assumption for a standardised curriculum is that in order to improve the overall effectiveness of EA, principles, concepts and fundamentals of EA must be taught and understood across all sectors and disciplines within which it is taught. This includes e.g. engineering, architecture, physics, planning, environmental sciences, geography, management and business. A first test for the usefulness of such a handbook was conducted in eight East Asian countries in the context of a follow-up project, called TwoEA-M. Results of these exercises were encouraging and are summarised in Fischer et al. (2010; www.twoeam-eu.net).

Based on the experiences gained, a similar approach was applied in the workshop. A short two-page questionnaire on the Handbook was distributed (See: Annex 3) along with a hard copy of the handbook which workshop participants were permitted to keep. Participants were then given the following instructions for completing an evaluation in about 45 Minutes:

1. Skim through the book;

2. Look at the questionnaire;

3. Skim through the book again; and

4. Complete the questionnaire.

Experiences with the evaluation were then discussed with workshop participants. Aggregated results of the completed questionnaires are subsequently presented.

1.3.1 Evaluation of part 1 of the Handbook

Part 1 of the Handbook (chapters 2-5) on current practice, needs and prospects were written from a purely European perspective. It was, therefore, particularly doubtful whether they would be considered useful to a Pakistani audience. Figure 9, however, shows that eleven out of eighteen workshop participants thought they were, with another seven saying they were somewhat useful. None said ‘no’ or ‘don’t know’. Asked whether a similar endeavour would also be useful for Pakistan (i.e. reflecting on experiences and needs of EIA education, fourteen (i.e. nearly 80%)

provided for an outright 'yes'. Two each said 'somewhat' and 'no'.

1.3.2 Evaluation of parts 2 and 3 of the Handbook

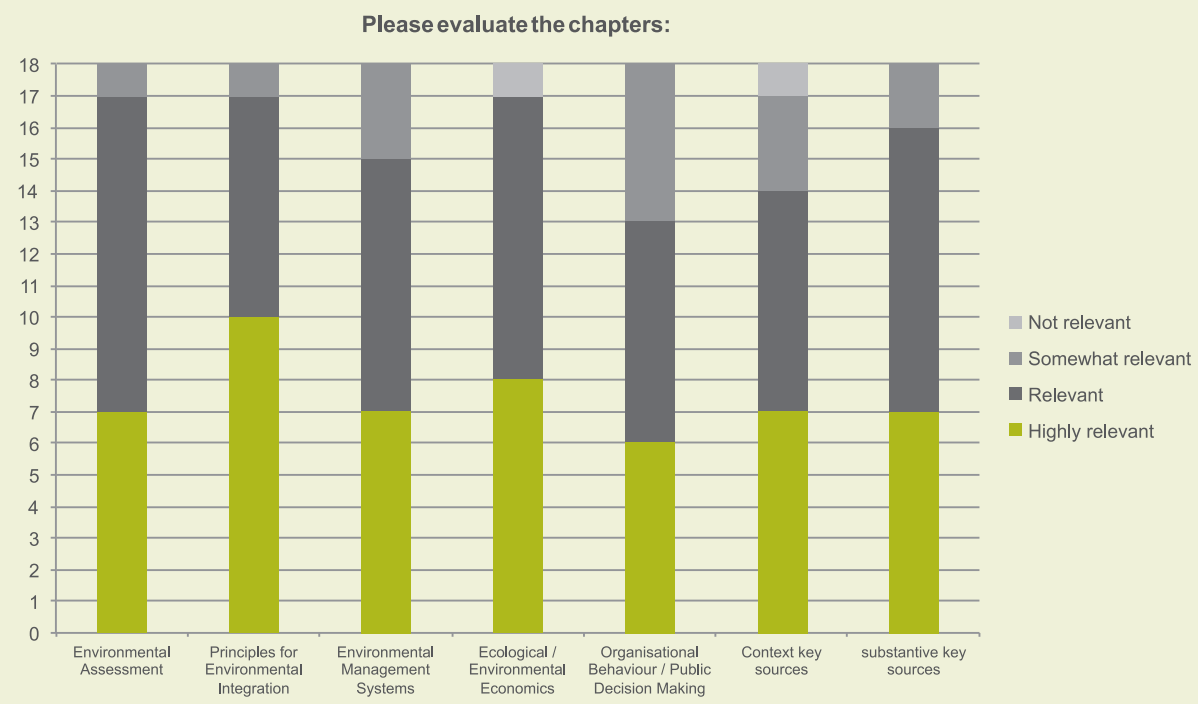
In terms of the requirements of a possible standardised EIA curriculum for Pakistan, evaluation of part 2 (chapters 6 to 10) was of particular importance, as this was covering the five core topics of such a curriculum. Figure 10 shows that an overwhelming majority of workshop participants thought that each of the five topics were either 'highly relevant' or 'relevant'. The 'organisation behaviour / public decision-making' topic had the highest share of respondents saying it was somewhat relevant only (five out of eighteen). Overall, however, workshop participants thought that the topics covered in the EA Lecturers' Handbook were clearly either 'highly relevant' or at least 'relevant'. This is an indication that the overall outline for an EIA curriculum may look similar to those used internationally. Taking into account other workshop survey results, the content of these topics will need to be adapted to the specific Pakistani situation, though.

Regarding part 3 (chapters 11 to 18 of the Handbook), both, context and substantive key sources were equally seen by workshop participants as being either 'highly relevant' or at least 'relevant'. Again, this is an indication that the way EIA can be taught in Pakistan is similar to wider international practice. However, written comments also indicate that some specific information should be adapted in order to be relevant for a Pakistani audience.

Further comments provided by workshop participants in the questionnaire include:

- Standardisation and internationalisation of degree programmes is also of interest in Pakistan;
- The generic approach of the handbook also makes it useful for Pakistan;
- Legislation, guidelines and case studies from Pakistan should be included;
- Materials from the US and Canada should be added;

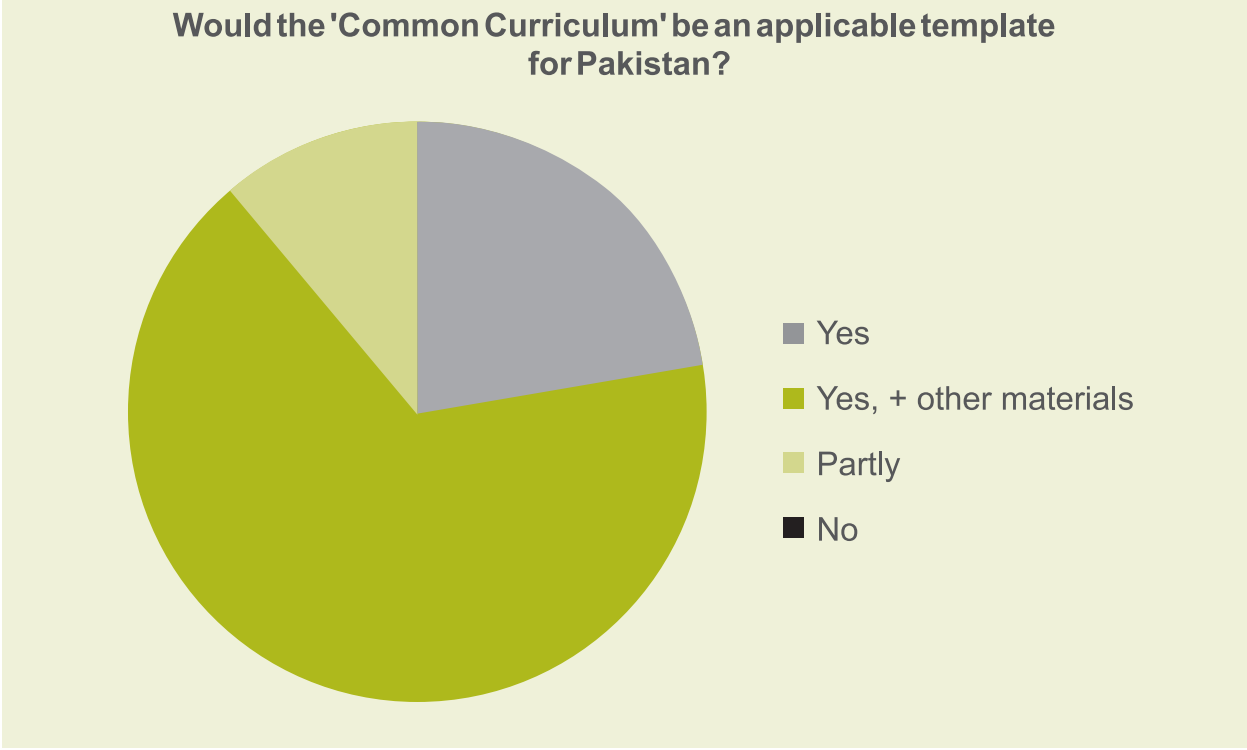
Figure 10: Relevance of parts 2 and 3 of the Handbook to a Pakistani audience



- More local case studies should be included;
- A UN perspective (e.g. millennium goals) should be included;
- How do you bridge the gap between government and the public, e.g. through public participation in EIA?
- Ethical and religious dimensions should be added;
- HEC is advancing an American higher education system and for this one course, there are unlikely to be changes, following European examples;
- After HEC devolution, when the five provinces are responsible, EU experiences will be useful;
- Standardisation of EIA education in Pakistan will be helpful;
- Management of the EIA project and establishment of baseline data should be included;
- Include a regulatory assessment;
- Social and economic aspects should be included;
- Exercises after each chapter should be included;
- EIA should be taught within courses, rather than degrees, as employment is low;
- Information on analytical hierarchy process and MCA is essential for common curriculum;
- A wider range of case studies should be included;
- A list of web-based sources for EIA case studies should be included; and
- The Pakistan Environmental Protection Agency Act should be discussed.

These findings also match the answers of workshop participants to the question whether

Figure 11: Applicability of the 'common curriculum' to a Pakistani audience



the 'Common Curriculum' would be an applicable template for Pakistan. While four out of eighteen (i.e. 20%) responded with an outright 'yes', fourteen (i.e. nearly 70%) said 'yes + other materials'. This is in line with what has been said before regarding the need to adapt teaching materials to the specific Pakistani context. Two also said 'partly'and none said 'no'.

1.4 Group work of workshop participants

In the early afternoon of the workshop day, participants were split into three groups in order to discuss three questions revolving around the further development of Tertiary Level Institutions' EIA teaching in Pakistan.

- The first question was about the specific training needs of EIA teachers / lecturers in Pakistan and about what initiatives may be useful to achieve effective training.
- The second question was about how SEA could be usefully (or 'better') included in the EIA curriculum and what support mechanisms may be useful.
- The third question, finally, was about the main barriers and enablers in achieving changes of current EIA curricula.

Boxes 1 to 3 show the bullet point complied by those discussing the topics.

Regarding specific training needs, the interaction between practitioners (i.e. consultants), governments / public administration (i.e. EPAs) and the education sector is stressed. To have these engaged in EIA training is thus both, of particular importance but also a great challenge. Furthermore, the engagement in 'real' projects (through e.g. field trips and participation in public hearings) is seen to be of great importance. Effective training should deal with data availability for EIA as well as providing access to the wider literature and best practice / success stories. Appropriate funding for training is seen as important, in particular for training activities abroad.

Box 1: Replies of workshop participants to the question 'what specific training needs of EIA teachers / lecturers do you think exist in Pakistan and what (type of) initiatives do you think would be useful in achieving effective training?'

(a) Specific training needs

- Collaboration between national and international EIA Experts.
- Sharing of knowledge/data with consultants, EPA's and other stakeholders.
- Practical exposure to EIA concerned projects and sites and exchange of views with EIA experts and related stakeholders.

(b) Existing opportunities

- Interaction with EIA experts/consultants/stakeholders.
- Short term trainings offered by some organisations (e.g. IUCN, PEC, SDPI, Leads, NCRD where is the funding coming from? (e.g. university budgets).
- Participation in public hearings.

(c) Initiatives for effective training

- EIA data availability.
- Access to literature related to best practices/success stories.
- Short trainings from NIAP as the conclusion of this project.
- Workshop organised by common platform (e.g. HEC), for all EIA teaching faculty from university.
- Provision of funds for EIA trainings for EIA faculty abroad.

Regarding the inclusion of SEA into the curriculum, the development of local case studies is seen to be of fundamental importance. Introducing SEA briefly at undergraduate level is seen to be sufficient, followed by a more in-depth treatment at post-graduate level. Capacity building and international professional exchanges are seen as further ingredient for an effective inclusion of SEA into Pakistani EIA curricula.

Box 2: Replies of workshop participants to the question 'how do you think SEA could be usefully (or 'better' included) in the EIA curriculum in Pakistani Tertiary Level Institutions? What external support mechanisms do you think may be useful?'

- Within Environmental Assessment course, a brief introduction of SEA at undergraduate level; detailed course at graduate level.
- Development of local case studies as a teaching tool (policies, plans, sustainability assessment, cumulative impacts).
- Development and analysis of (project) development case studies.
- Capacity building programme similar to 'Master trainers programme' for SEA.
- Liaison with international universities' teachers and experts.

Box 3: Replies of workshop participants to the question 'what do you think may be the main barriers and enablers to achieving changes of current EIA curricula in Pakistan?'

Barriers

- Institutional: own academic bodies such as Board of Studies, Academic Council and Advanced Studies.
- HEC limitations for given credit hours (130 -140 credit hours).
- Existing (3+0) needs changing into (2+1).
- Gender issues/cultural issues.
- Funding availabilities for field visits.
- Access to current literature lacking.
- Security reasons.
- International contents use for teaching material.

Enablers

- Capacity building to develop curricula (like International experts consultation).
- No professional bodies i.e. PEC, PMDC exist in case of EIA [but should].
- Assistance required by IFIs (International Finance Institutions).

Finally, a number of barriers and enablers were mentioned in achieving changes of current EIA curricula in Pakistan. Barriers revolve around three main issues; institutional, funding and external. The former includes university internal structure, e.g. academic councils or boards of studies which may be opposed to reforms. Furthermore, it also includes external structures, including perceived inflexible HEC requirements. Insufficient funding for field trips and proper access to the wider literatures are also seen as barriers. Finally, gender and cultural issues (i.e. over half of the EIA students are female, but only somewhere around 10% of the EIA workforce is, mainly due to the traditional role as a housewife). External barriers include security concerns which make field trips, in particular to more rural areas difficult. Furthermore, the reliance on international, rather than local contents in the curriculum is seen to be problematic.

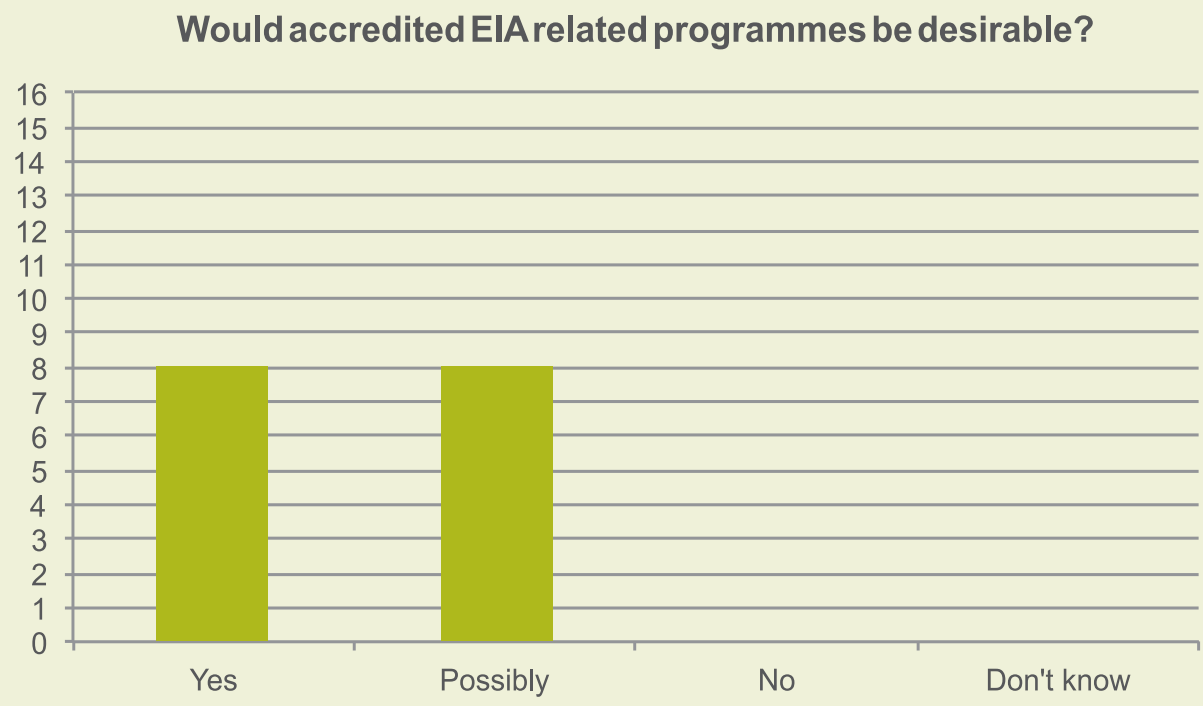
Enablers are said to include a professional EIA body, which is not currently in existence. Furthermore, capacity building activities are seen to play an important role. Finally, the assistance of international finance institutions is seen to be of importance.

1.5 Final audience response system survey

In this section, the results of the final brief workshop survey are presented. The questions for these were put together during the workshop day based on comments made by workshop participants. The main purpose of these questions is to obtain further evidence for how EIA teaching in Pakistan could be improved.

While it is clear that current EIA teaching in Pakistan has many positive aspects, there are also some obvious weaknesses, mainly in terms of an underdeveloped link between academia and industry, the lack of local teaching materials (textbooks, case studies), and a somewhat secondary status in teaching programmes. While some of these perceived weaknesses are, comparatively speaking, simple to address,

Figure 12: Desirability of possible accreditation of EIA degree programmes in Pakistan



others may require an effort on various fronts, including the institutional set-up of tertiary level education in Pakistan.

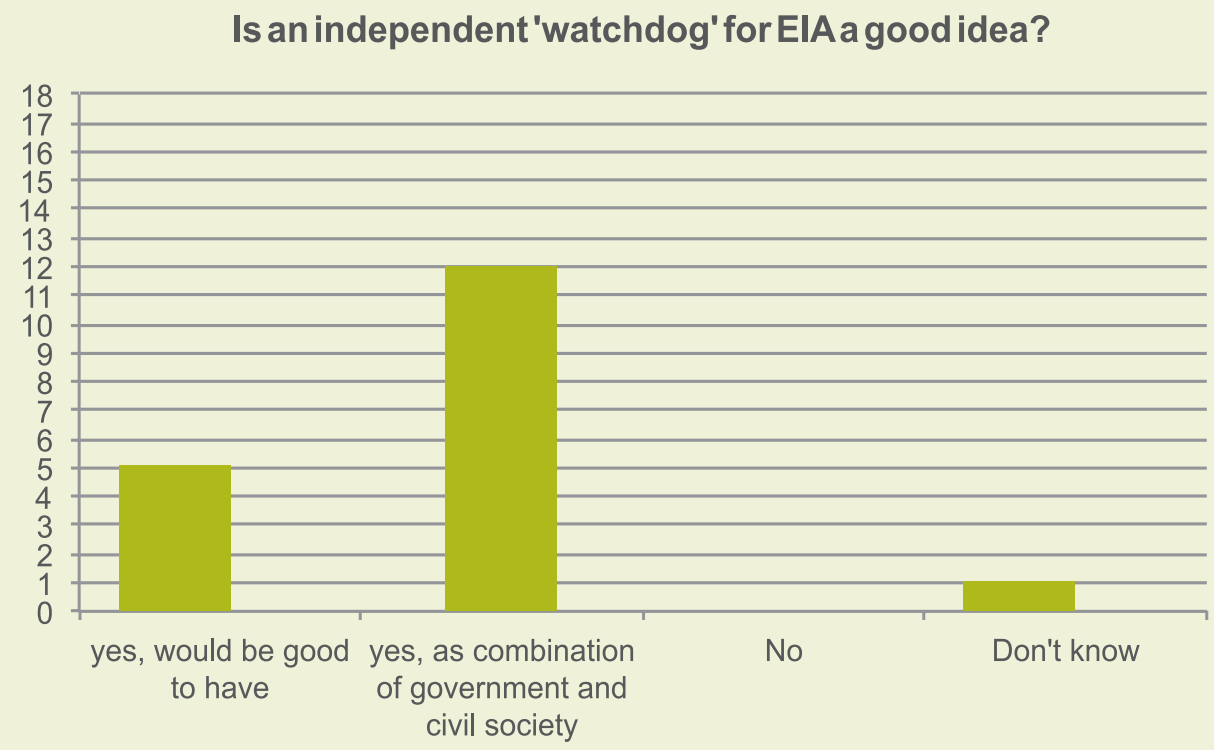
One possible way to ensure high quality university degree programmes may be through accreditation. This has proved successful in a number of countries for ensuring minimum standards. Formal and at times compulsory accreditation is common practice in areas such as Law, Medicine, Architecture and Town Planning. Internationally, for environmental assessment related degree programmes, accreditation bodies include e.g. the UK Institute for Environmental Management and Assessment (IEMA) or in the Netherlands the Dutch Government.

Figure 12 shows replies by workshop participants to the question whether accredited EIA related programmes would be desirable in Pakistan. Of sixteen respondents, eight gave an outright 'yes' to this question and another eight said 'possibly'. There were no 'No' or 'Don't know' replies. This is a strong indication that tertiary level education representatives in Pakistan have a positive attitude towards accreditation.

The second related question was about whether an independent professional body (the term 'watchdog' was used) for EIA for Pakistan would be a good idea. Besides being a body for ensuring the quality of EIAs, such a watchdog could also be used for accreditation of EIA related University degree programmes. Workshop participants were very clear that this is a good idea, with seventeen out of eighteen respondents sharing this opinion (Figure 13). No-one was against the idea with one workshop participant saying s/he didn't know. Twelve of the seventeen respondents who were in favour of the idea, also said that this should be in a combination of government and civil society.

The final two questions revolved around the possible production of a Pakistani Environmental

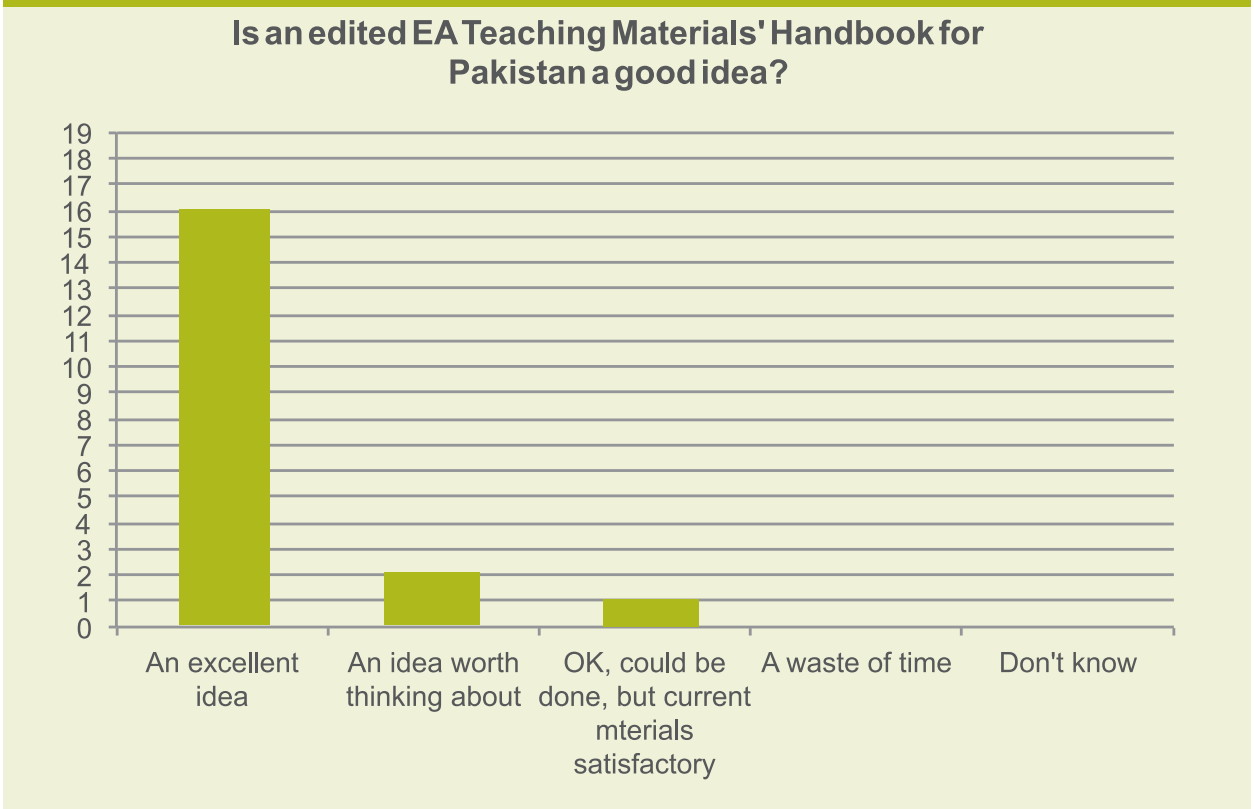
Figure 13: Attitudes of workshop participants to an independent professional body for EIA



Assessment Handbook. When asked whether an edited EA Teaching Materials' Handbook for Pakistan was a good idea, sixteen out of nineteen respondents stated that this was an 'excellent' idea with a further two stating that this was an idea worth thinking about. Only one was of the opinion that this could be done, but that current teaching materials were satisfactory.

Furthermore, when workshop participants were asked whether they were willing to contribute to such a handbook with a book chapter, thirteen out of eighteen responding said 'yes', with another five saying 'maybe'. No-one said 'no' or 'don't' know (See: Table 4 in part 2).

Figure 14: Workshop participants' opinions on the preparation of a Pakistani EA Handbook



2. Summary of results of the second workshop on 'Enhancing the relevance of EIA curricula in Pakistani higher education institutions – towards closer links with the public sector, industry and practice' in Islamabad, 05/11/2012

In preparation of the second workshop, a draft report, summarising the results of the first workshop and making recommendations for further action was sent to all those institutions offering EIA related courses (See: annex 1), along with a request for feedback, in particular with regard to inaccuracies or misrepresentations. Comments from three EPAs and one HE institution on the draft report were received before the 2nd workshop. Overall, the feedback given was constructive and very positive. Recommendations for the further development of the curriculum were fully met in a redrafting of the report. This included various clarifications and corrections. Survey participants suggested that HEC should change their current EIA outline, which is currently perceived to offer only a limited framework.

Representatives from all tertiary level academic institutions teaching EIA were invited to the second workshop, along with representatives from the:

a. National HEC;

b. Federal Ministry of Climate Change;

c. Provincial EPAs; and

d. EIA industry (i.e. consultancies).

Considering the frequently identified gap between academia, government and industry, the presence of groups a. to d. was seen to be of particular importance in the second workshop. Table 4 shows the participants of the workshop.

In total, 46 people attended the workshop, among which nineteen representatives of sixteen Pakistani universities (See: Annex 1). Furthermore, fourteen EPA representatives were present, among which four from Pak-EPA, three from Azad Jammu and Kashmir (AJ&K), three from Punjab, two from Balochistan, and one each, from Sindh and Khyber Pahtunkhwa. There were two representatives each from the Ministry of Climate Change and private sector institutions. Finally, eight representatives of the NIAP programme, a representative of the Asian Development Bank and the author of this report were present. While it was very positive that there were representatives of all those groups previously identified as being of particular importance with regard to improving the EIA curriculum, the private sector was somewhat under-represented.

The workshop agenda revolved around several presentations by various workshop participants. Ample space was given for comments and discussion. The Agenda was as follows:

9:00 Recitation from Holy Quran
9:05 Welcome remarks (Saeed)
9:10 Introduction to the workshop day and objectives (Fischer)
9:20 Remarks by the chief guest
9:30 Tea/coffee break
9:45 Presenting conclusions and recommendations from the 'EIA teaching at tertiary level academic institutions in Pakistan' report and any feedback received (Fischer)
10:20 Contents of a current 2+1 EIA course (Irfan Khan)
10:40 Experiences with changing a 3+0 to a 2+1 (Rabia Zafar)
11:00 What does industry expect from EIA graduates / from universities offering EIA related degrees (Hidayat Hasan)
11:30 Towards a new EIA curriculum outline – suggestions and comments (Fischer and workshop participants)
12:00 Preparing an EA Handbook for Pakistan; further steps (Fischer and workshop participants)
12:30 Training of public administrators and teachers: what is required? (Fischer and workshop participants)
13:00 lunch break
14:00 Panel discussion: Views of provincial EPAs on conclusions and recommendations of the report
15:00 Discussion between workshop participants
15:20 Enablers and barriers to what has been discussed and suggested: Reflections by those who need to implement changes: Group work (3 or 4 groups)
16:00 Feedback from groups
16:30 Reflections and wrap up of day (all workshop participants, Fischer)
16:50 Closing remarks and farewell (Saeed)

Subsequently, the main findings of the day are summarised, following the agenda introduced above.

Introduction to the workshop day and objectives
Following the introduction to the workshop day and the objectives, a lively discussion arose, where participants underlined that provincial EPAs had developed various EIA manuals which needed to be considered in the curriculum. Furthermore, several participants suggested that there was a need to assess the capacity of HE institutions to deliver EIA teaching. Generally, while capacity was thought to be sufficient in certain institutions it was seen to be underdeveloped in others. It was particularly those that were perceived as posing a barrier to improving EIA education and practice. Various suggestions were made to distinguish between what is taught at undergraduate and what is taught at post-graduate levels. These revolved around providing undergraduate students only with some general and basic knowledge and post-graduate students with more advanced details. However, there was no consensus on the exact details of this distinction.

Pre-lunch presentations
In the first presentation after the morning coffee/tea break, the author of this report summarised the main points of the baseline data

Table 4: Participants of the second workshop in Islamabad on 05/11/2012

ATTENDANCE SHEET

NATIONAL IMPACT ASSESSMENT PROGRAMME

Enhancing the relevance of EIA curricula in Pakistani higher education institutions – towards closer linkages with the public sector, industry and practice

Serena Hotel, Islamabad

November 5, 2012

S. #	Name	Organization	Contact	Signature

generated in the various surveys that had been conducted before and at the first workshop. Generally speaking, comments received from the audience were largely positive and no suggestions were made that any of the analysis and interpretation were faulty or misrepresenting current practices.

In the second presentation, Irfan Khan (Islamic International University) summarised the outline of a newly designed 2+1 EIA course (not yet taught). Lectures in this course follow closely EIA procedural stages. Furthermore, practice elements were mainly based on hypothetical case studies. The key literature used was by US American and UK authors. In addition, Pakistani legislation and guidance documents were also on the reading list.

In the third presentation, Rabia Zafar (Environmental Sciences Department, SBK Women's University) talked about her experiences with changing an existing 3+0 course to a 2+1 course. She reported that this change had been surprisingly smooth without any resistance from her University, Faculty and Departmental bodies. If this was representative of other universities, making courses more practical by converting them to 2+1 or 3+1 should be rather straightforward. In the ensuing discussion, the University of Baluchistan offered SBK Women's University to co-operate with regard to their EIA teaching programmes.

Hidayat Hasan (Hagler Bailly Pakistan) then talked about what industry expects from EIA graduates. In this context, he made several suggestions for what was required in order to improve EIA teaching. He reminded participants that they were producing a product, namely the graduate. He added that he was very pleased with being invited to the workshop as no-one had asked him what he considered to be important before. In this context, he suggested that there was clearly a need for more frequent dialogue between what he called 'users' and 'producers'.

Hasan explained that for each job on offer they tended to interview about ten candidates, but that unfortunately the quality of applicants was normally rather poor. In particular, he was usually disappointed about some rather poor writing skills of the candidates. He stressed that he didn't expect candidates to know everything, but that there was a real need to develop transferable skills at universities better. In this context, he stressed that it wasn't so much the English itself which was a problem, but rather an inability to use technical language and approaches; i.e. an inability to identify a problem, to show different options for how this problem may be tackled and then to provide for a clear method on how the problem may be solved. Furthermore, there was a lack of experiences with any real projects amongst graduates.

Hasan stressed that EIA should not and cannot be considered one course only. Rather, it should be regarded as the course that 'glues everything together', drawing on aspects of numerous disciplines, including science, engineering and social science. Thus, any course on EIA has to connect the topic with specialist knowledge which is taught in other courses. He expressed some surprise that there did not appear to be many differences between science and engineering graduates, observing that both had similar strengths and weaknesses.

In order to address the theory-practice gap, Hasan stressed that internships were important. He suggested that these should last for at least two months as there was usually no real learning effect with placements shorter than that. Also, any placement should come with a report on learning outcomes.

During the ensuing discussion, various people mentioned the importance of considering social impacts in EIA and how this may be effectively facilitated. Participants agreed that no separate social impact assessment (SIA) should be conducted, but that instead both, social and economic aspects should be included in EIA.

Furthermore, the potential importance of the forthcoming ISO standard 14055 for Pakistan was stressed. This is a standard currently under development for establishing good practice for combating land degradation and desertification.

Finally, that environmentally relevant projects were frequently taking place in remote areas was seen as a problem for the consultancy sector, in particular with regard to not being able to send female members of staff there. Generally speaking, Hasan suggested that some research was probably needed into how many and what type of EIA graduates were needed and also into what the general needs of industry and the public sector were.

Post-lunch presentations and discussions

After the lunch break, this author gave a presentation on the suggested EIA curriculum outline. The draft curriculum combined aspects of international best practice EIA teaching standards (based in particular on the findings of the evaluation of the Environmental Assessment Lecturers' Handbook during workshop 1). The suggested curriculum was quite extensively discussed and various suggestions for changes were made. These were all considered and all suggestions were reflected in a preliminary final version of the curriculum, which was subsequently commented upon by a further nine EIA experts. The final product is presented in part 3 of this report. A particular important outcome from the discussion was the suggestion that the time requirements of the curriculum should be left open. The draft version distributed to all participants of workshop 1 had focused on a 2+1 time scale. However, participants felt that it should be up to the individual university / institution to decide how much time should be spent on each topic included in the curriculum. Furthermore, references were said to be needed for each of the topics covered that teachers can use in order to obtain further information. Finally, it was suggested that a more in-depth explanation of the various practical student work elements was needed.

Following the presentation on the EIA curriculum, EPA representatives made some statements on EIA teaching in Pakistan. The first was by a Federal EPA representative, who started reminding workshop participants of Pakistani attitudes and practices. He said that 'Pakistanis were not very good at applying the laws'. Furthermore, he stressed that at the moment in the Pakistani education system, there was a lot of emphasis on theory, rather than practice. In this context, he suggested that it was not an exception that graduates who had taken a course on EIA did not know how to conduct one in practice. However, he suggested that this was the same with engineering and science students in that, for example, an engineering graduate did not normally know how to construct a bridge. He also suggested that it was not difficult to get access to EIA reports and that there was no confidentiality issue as had been suggested by some of the academics in both workshops. He said that the real reasons for EPAs being reluctant to hand out EIA reports was the 'cut-and-paste' problem, with which he meant the problem of consultancies copying parts from an existing statement into a new statement. He urged that any recommendations coming out of the NIAP programme should be as practical as possible. Furthermore, he stressed that both, EIA and SEA were important and that these should be instruments that include other aspects and practices, including e.g. social aspects and cumulative impacts.

Further statements were made by provincial EPA representatives. Generally speaking, provincial representatives were of the opinion that an independent professional body for EIA was not sustainable at this moment in time. Rather, EPAs needed strengthening first. It was also suggested that more 'innovation' was needed. In discussing this, several workshop participants said that innovation was actually brought about by SEA with regards to various aspects, including in particular the consideration of a wide range of alternatives. One of the main current shortcomings of EIA practice was said to be the

lack of proper enforcement mechanisms. As a consequence, EPA representatives suggested that there was no effective market demand for EIA. Regarding technical aspects of capacity building of young trainers, the main focus should be in particular on how to make predictions in EIA and how to evaluate them. Analytical skills and knowledge of methods and techniques was said to be underdeveloped among Pakistani graduates at the moment.

Further steps for the preparation of an EIA Handbook for Pakistan were discussed. Two more academics and one IUCN representative expressed their willingness to contribute to such a Handbook, bringing the total number of Pakistani contributors up to thirteen. The names of those wanting to contribute and suggested chapter themes are shown in Table 4.

Table 4: Workshop participants who said they were interested in contributing to an EA Handbook for Pakistan with a book chapter

Name of person interested in contributing a book chapter	*Topic of potential book chapter*
First Workshop:	
1. Dr Rizwan Hameed	Legal aspects of EIA and guidelines for preparation and review of EIA reports
2. Dr Obaidullah Nadeem	Public participation in EIA in Pakistan
3. Dr Amir H Malik	EIA of solid waste management
4. Dr Zuhaib Siddiqui	
5. Mansoor Khan	Crises in Pakistan and lack of EIA implementation and gaps in policies / the current Act
6. Rabia Zafar	
7. Zahoor Ahmad Bazai	Socio-economic aspects in EIA
8. Ljlal Hussain	EIA on large projects
9. Muhammad Umar Hayyat	Evolution of EIA in Pakistan
10. Dr Farhat Abbas	EIA of water resource projects
Second workshop	
11. Abdul Rashid Memon	EIA of irrigation projects in Pakistan
12. Dr Aneel Salman	Economic instruments
13. Miriam Kugele	Climate proofing

3. EIA curriculum for tertiary level academic institutions in Pakistan

There are various options for the development of an EIA curriculum for Pakistani tertiary level academic institutions. These range from curricula for e.g. full diploma degree programmes in EIA to a 2+0 lecture based EIA course. This section presents a generic curriculum, which can be adapted to different purposes. The curriculum is presented in 16 themes, each consisting of lecture and practice elements. While it can thus be readily used in a 16 week semester 2+1 course, it can also be taught over e.g. two or more courses.

Based on the results of the various surveys conducted with Pakistani representatives of tertiary level academic institutions, it has been established that the overall curriculum outline can be in line with what is considered to be good practice internationally. However, the specific content needs to be both, international as well as Pakistan specific. This has been kept in mind when developing the curriculum outline.

A first draft of the curriculum outline was discussed during the second workshop. Based on the comments received, the curriculum was developed further. Subsequently, a second draft received some very detailed comments by a further nine EIA experts. These included:

The Ministry of Climate Change and EPAs;

1 Mohammed Tahir Durrani, Director EPA Balochistan;
2 Mehwish Durrani, EIA expert, AJ&K-EPA; and
3 M Mansoor Khan, Ministry of Climate Change.

Pakistani Universities

4 Kishan Chand Mukwaa, Environmental Engineering, Q e A Engineering University Nawabshah
5 Rabia Zafar, Sardar Bahadur Khan, Women's University, Quetta
6 Dr Obaidullah Nadeem, City and Regional Planning, University of Engineering and Technology, Lahore
7 Dr Aneel Salman, Management Sciences and Humanities, GIK Institute of Engineering, Sciences and Technology

The private sector

8 Shahid Lutfi, Environmental Engineer and Consultant

IUCN

9 Miriam Kugele, Climate Change and Sustainable Energy, IUCN Pakistan

The following main comments and suggestions were made, which have all been included in the final version of the curriculum outline:

- Add a new section on 'assessment of impacts', dealing with assessment methods and techniques (theme 7);
- Theme 1: include 'objectives of EIA';
- Theme 1: include 'EIA origin and development';
- Theme 2: include 'importance and effectiveness of advocacy in decision-making';
- Theme 3: include mentioning of ecosystem services;
- Theme 3: include mentioning of gender issues / gender mainstreaming;
- Theme 5: include performance standards of www.ifc.org;
- Theme 6: add 'project categorization' to screening; as well as the role of environmental sensitivities and area attributes in project screening;
- Theme 6: include teaching material on the 'development of the baseline situation';
- Theme 8: include 'trans-boundary issues and projects in disputed territories' (World Bank);
- Theme 11: include a section on the role of an 'environmental and social management plan';
- Theme 11: include a section on the role of 'environmental management systems';
- Themes 14-15: reorganise sections, with 14 providing for a general introduction to SEA and 15 dealing with Pakistani specific aspects and policy SEA application;
- Theme 16: include an introduction of the concept of sustainable development;
- Mention the role of provincial EPAs wherever suitable;
- Mention the importance of public participation for different procedural stages; and
- Don't include publication dates of Pakistani legislation and guidelines as they are regularly amended.

While one of the experts suggested that theme 16 be removed on the basis that this may lead to confusion among policy makers, this theme was retained mainly because others found it actually very important, in particular in terms of discussing how trade-offs may be dealt with. Furthermore, specific provincial, regional and local case studies have not been added, as these will have to suite specific teaching objectives (e.g. accessibility during one day field trips, reflection on certain issues or procedural stages).

It is suggested that themes 1-10 are suitable for both, undergraduate and postgraduate levels (i.e. bachelor and masters levels). Themes 11-16, on the other hand, are thought to be particularly suitable for post-graduate teaching (i.e. masters levels).

All references and sources provided are web-accessible and therefore easily usable. Some other, non-web-based key resources are also provided at the end of section 3.

Theme 1: What is EIA, what is it trying to achieve, what are its principles, what benefits can result from EIA if considered in decision-making and where in the world is it applied?

Lecture-based element

1.1 Definitions of EIA: see reference 9, pp.44-45 and reference 24.

1.2 Principles of EIA: see reference 16 and reference 26a.

1.3 EIA origin and development: see reference 27a, pp.108-109

1.4 Different types of impacts: see reference 9, p.45 and reference 26b.

1.5 Objectives, purposes, scope and benefits: see reference 9, pp.46-47 and reference 26c.

1.6 EIA effectiveness: see reference 9, pp.47-48.

1.7 Different legal, administrative and policy frameworks internationally: see reference 9, pp.49-50.

1.8 Context specific applications: see reference 9, pp116-121.

Practical element

1.9 Students are to research other decision-making support tools and find out how they work, including e.g. cost-benefit analysis – CBA, multi-criteria analysis – MCA, life-cycle-assessment – LCA, technology assessment, risk assessment, generic modelling tools and others; students should prepare a table as to how these differ from EIA: see e.g. reference 9, pp.102-103.

Theme 2: Decision-making theory and practice

Lecture-based element

2.1 The role of advocacy in decision-making: see reference 18.

2.2 Actors interacting in the EIA process: see reference 9, p.93.

2.3 Organisational behaviour: see reference 9, pp.94-98.

2.4 Decision making models: see reference 9, pp.98-101.

2.5 Influences on decision-making: see reference 9, pp.101-102.

2.6 EIA as part of the decision-making process: see reference 26d.

Practical element

2.7 Students should discuss how public decisions are made in Pakistan; furthermore, a role play should be conducted around decision-making; the suggestion here is to focus on tourism development in a hypothetical country. While the concrete outline is for the lecturer to prepare, a possible case could be organised as follows:

- Think up a hypothetical country, where one part is fairly well developed and the other is not; prepare a map with features (mountains, coastline, archaeological sites, sensitive environments, such as wetlands or deserts, towns and infrastructure).

- Use an assumed interest of a developer to build a number of big hotels near the coastline as the basis for your case study; the developer wants to have the hotels near the coast in an environmentally sensitive area in the less developed part where a large proportion of people

leading traditional lifestyles (indigenous people) live.

- o Divide the student cohort into different groups which represent national ministries of e.g. economic development, environment, indigenous people and infrastructure.

- o Each of the student groups should discuss the developer's proposal from the point of view of the ministries they represent and should think of 'counter' or amended suggestions, keeping in mind the importance of the developer who is investing in the country.

- o Spokespersons of the ministries are then to get together and discuss the development and their own 'counter' / amended suggestions in front of all students and try to come up with a solution that everyone can agree on. The lecturer is to take on the role of the country's president who needs to be convinced.

- o All students to reflect on the exercise in terms of issues of decision processes, power and environmental issues; how could EIA have facilitated this process?

Theme 3: Main environmental problems the international community and Pakistan are faced with

Lecture-based element

3.1 The environment: physical, biological and social aspects: see reference 9, pp.60-63.

3.2 Drivers for environmental change: see reference 25, pp. 4-30.

3.3 Existing and emerging environmental threats: see reference 9, pp.66-68.

3.4 Principles for environmental integration: see reference 9, pp.63-66.

3.5 Environmental integration through assessment tools and instruments: impact assessments; territorial ecosystems assessment, organisational assessment, product and technology assessments: see reference 9, pp.27-31.

3.6 The ecosystem services approach and its potential usefulness in EIA: see http://www.teebweb.org/resources/ecosystem-services/

3.7 Mainstreaming of other issues that tend to be subordinated to economic considerations, e.g. gender issues (gender mainstreaming): see http://www.undp.org/content/undp/en/home/ourwork/hiv-aids/Projects-initiatives/mainstreaming_hivandgenderintoenvironmentalimpactassessment/

Practical element

3.8 Groups of students should reflect on specific environmental problems in Pakistan and how they are being aggravated (or not) by human activities (directly, i.e. construction, as well as indirectly, i.e. climate change): see e.g. reference 14 and reference 29b.

Theme 4: Legal EIA background and guidance on EIA in Pakistan

Lecture-based element

4.1 EIA in Pakistan: an overview: see reference 19, chapter 5 and reference 29a.

4.2 Introduce legislation:

4.2.1 Pakistan Environmental Protection Agency (Review of IEE & EIA) Regulations;

4.2.2 Pakistan Environmental Protection Act;

4.2.3 Pakistan Environmental Protection Policy; and

4.2.4 Other materials, including e.g. provincial EPA manuals.

4.3 Introduce Guidelines:

4.3.1 Pak-EPA's policy and procedure as well as guidelines for preparation and review of IEE/EIA reports; and

4.3.2 Pak-EPA's sectoral guidelines for various types of development projects.

Practical element

4.4 For hypothetical projects , the students need to decide on whether EIA was likely to be required, based on existing legal requirements.

Theme 5: requirements of international development banks

Lecture-based element

5.1 Presenting World Bank and other development banks practices.

5.1.1 An overview of practices in international organisations: see reference 26e.

5.1.2 Look at www.worldbank.org for general infos (>countries>South Asia gets you to Pakistan); see also reference 30.

5.1.3 Look at http://www1.ifc.org/wps/wcm/connect/3be1a68049a78dc8b7e4f7a8c6a8312a/PS1_English_2012.pdf?MOD=AJPERES for performance standard 'Assessment and Management of Environmental and Social Risks and Impacts' of the International Finance Corporation.

5.1.4 Look at EIA activities of the Asian Development Bank: reference 1a.

Practical element:

5.2 Students to go to World Bank / Asian Development Bank / websites of international development organisations and summarise what they find on EIA and how these institutions are attempting to promote good practice.

Theme 6: Screening / project categorisation and scoping

Lecture-based element

6.1 Introduce types of screening: descriptive and discretionary, taking into account environmental sensitivities and area attributes: see reference 26f.

6.2 Introduce checklists for screening and project categorisation for IEE / EIA under Pakistani regulation.

6.3 Screening in Pakistan: see reference 19, chapter 5, pp.100-101; see also reference 4.

6.4 The role of screening checklists; e.g. the rapid environmental assessment (REA) checklists of the ADB: see reference 1biii.

6.5 Scoping: what is it? Purpose, objectives, guiding principles; importance of appropriate timing of conducting scoping: see reference 9, pp.136-139.

6.6 Scoping: ways of undertaking it and the role of the public; criteria of good practice: see reference 9, pp. 140-142; see also Pakistan EA Guidelines.

6.7 Types of impacts to be identified: see reference 7.

6.8 Establishing what baseline data need to be considered: see reference 1bi, p.6.

6.9 Methods and techniques used in screening and scoping: see reference 9, pp.158-165.

6.10 Scoping in Pakistan: see reference 11.

Practical element:

6.11 Determine the EIA scope for a hypothetical project in Pakistan, e.g. a road or a factory.

Theme 7: Assessment of impacts

Lecture-based element

7.1 Methods and techniques used for assessing impacts in EIA: reference 9, pp.158-165; and reference 22a, pp.5-17.

Practical element:

7.2 For different types of development, e.g. roads, airports, power plants, waste management facilities, small groups of students should jointly consider what methods may be suitably applied to assess impacts of different alternatives and then report back to the whole class.

Theme 8: Public participation and consultation in EIA

Lecture-based element

8.1 Explain the key role of public participation and consultation in the EIA process, in particular during the scoping and assessment phases: see reference 27b.

8.2 Elaborate on the public and public interest: see reference 9, pp.104-105.

8.3 Elaborate on the public and stakeholders: see reference 9, p.105.

8.4 Identify role of EPAs (as major stakeholders) in each EIA step: as outlined in provincial EPA EIA guidelines.

8.5 Describe the history and rationale pertaining to EA and public decision-making: see reference 9, pp105-108.

8.6 Establish participation and consultation techniques and their suitability for different situations: see reference 9, pp.108-112.

8.7 Elaborate on trans-boundary considerations and public participation: see reference 23.

8.8 Elaborate on public participation in Pakistan: see reference 19.

Practical element:

8.9 Visit a public hearing or conduct a public participation mock exercise with the students.

8.10 Review World Bank Safeguard policies (environmental assessment and disputed areas): http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTLAWJUSTICE/0,,contentMDK:22226433~menuPK:6256357~pagePK:148956~piPK:216618~theSitePK:445634,00.html

Theme 9: Baseline data collection and presentation, identification of impacts, consideration of alternatives and mitigation in EIA

Lecture-based element

9.1 Outline what baseline data may need to be collected and reported on in EIA: see reference 1bi, p.6.

9.2 Introduce data collection methods and techniques: see reference 26h.

9.3 Identifying of different types of impacts: see reference 7.

9.4 Role of alternatives in EIA: see reference 12a.

9.5 Types of alternatives that can be considered: see reference 12a.

9.6 The ‘zero’ or ‘no action alternative’: see reference 12a.

9.7 Identification of suitable alternatives for use in EIA: see reference 12a.

9.8 Establish the importance of avoidance, mitigation, as well as compensation measures.

9.8.1 Introduction – the importance of mitigation and key elements: see reference 9, pp166-169.

9.8.2 Avoiding environmental impacts: see reference 9, pp169-174.

9.8.3 Remedial action: see reference 9, p174-178.

9.8.4 Criteria for successful implementation: see reference 9, pp178-179.

Practical element:

9.9 Students should develop suitable alternatives for EIA in different sectors, e.g. transport, energy, resource extraction and waste, and consider suitable methods or techniques for assessing them.

Theme 10: EIA reporting and EIA report quality reviews

Lecture-based element

10.1 Explain the importance of EIA review: see reference 9, p.52; see also reference 26g.

10.2 Introduce EIA review packages: see reference 6; a package suitable for reviewing EIAs in Pakistan should be developed by the lecturer upfront.

10.3 Introduce some 'real' good practice reports' (should be both, international and national); for international examples, see e.g.

10.3.1 Various international statements based on reference 21.

10.3.2 US: nearly 4,000 environmental impact statements based on reference 3.

10.4 Discuss the various parts of an EIA report and ask students to elaborate on what is written well and what is not; on EIA report adequacy in Pakistan, see reference 20.

Practical element:

10.5 Conduct a quality review of an EIA statement (from Pakistan) and discuss review experiences with the teacher and other students.

10.6 Stress the importance of writing skills; if possible get somebody in from a social science department who is dealing with 'good writing'.

Theme 11: EIA follow-up, monitoring and auditing; the role of environmental and social management plans

Lecture-based element

11.1 What is EIA follow-up and why is it relevant? see reference 9, pp.183-185.

11.2 Who is involved in EIA follow-up? see reference 9, pp.85-186.

11.3 When and how do you do EIA follow-up? see reference 9, pp.186-189.

11.4 The potential role of a follow-up programme / environmental and social management plan and possible connections with environmental management systems: see reference 1bii; see also reference 9, pp.70-81.

11.5 What are barriers and enabling factors for EIA follow-up and challenges: see reference 9, pp.189-192.

11.6 Explain Pakistani specific technical requirements for e.g. air, water / soil monitoring and auditing (if possible, invite experts from science / engineering departments in)

Practical element:

11.7 Field visit of a project, possibly one which has previously been covered in e.g. within the EIA report quality review theme, and evaluation of situation after construction: is monitoring in place? Have predicted impacts or unpredicted impacts occurred?

Theme 12: Studying specific EIAs (guest lectures by consultants/public servants)

Lecture-based element

12.1 Reporting on positives and negatives, problems and success stories of an EIA.

Practical element:

12.2 Students reflecting on how problems and negatives could have been avoided and positives and successes enhanced in EIA.

Theme 13: EIA effectiveness – what do we need to consider in order to enhance positive and avoid negative effects

Lecture-based element

13.1 Exploring effectiveness – terminology and conceptual frameworks: see reference 9, pp.122-126.

13.2 EIA effectiveness criteria: see reference 9, pp.126-129.

13.3 Empirical evidence: see reference 9, pp.129-131.

13.4 How to support effective EIA: see reference 9, pp.131-133.

13.5 Presenting examples showing the impact of EIA: see reference 8, pp.6-8.

Practical element:

13.6 Write a short essay on how EIA is effective in greening decision-making and find some Pakistani examples.

Theme 14: SEA part 1: Introduction to SEA

Lecture-based element

14.1 Introduction to SEA; explain what it is, how it differs from EIA: reference 12b, pp.4-5.

14.2 Potential benefits of SEA: reference 12b, pp.5-6.

14.3 Principles of SEA and different SEA approaches: see reference 12b, pp.7-11.

14.4 Introduce a tiered approach to SEA: see reference 9, pp.46-47; see also reference 10, pp.38-40.

14.5 Present some international plan and programme SEA case studies: see reference 17, 'recommended SEAs'.

Practical element:

14.6 Students to write a summary on how SEA differs from EIA.

Theme 15: SEA part 2: SEA application in Pakistani planning processes and at the policy level

Lecture-based element

15.1 Introduce different planning processes in Pakistan and elaborate on how SEA may be applied to those: see e.g. the website of the Planning Commission of Pakistan (http://www.pc.gov.pk/CH-1.html) and

15.2 Introduce policy level SEA: see reference 22b, pp1-7.

15.3 Evidence for the effectiveness of SEA at the policy level: see reference 28.

15.4 Present the specific challenges with applying SEA at policy levels of decision making; the need to consider different policy situations: see reference 22b, pp.7-8.

15.5 Case study: Renewable energy policy in Scotland: see reference 2, pp.141-149.

Practical element:

15.6 Students to reflect on the way in which policy, plans and programmes are prepared in Pakistan and how SEA may fit into existing procedures.

Theme 16: Developing EIA and SEA further: Integrating different aspects and sustainability assessments

Lecture-based element

16.1 Introduce the concept of sustainable development and explain what it entails: see http://www.iisd.org/sd/.

16.2 Present rationale for integrating different aspects in assessment: see reference 15.

16.3 Reflect on pros and cons of integration: see reference 18.

16.4 Present real life integrated assessment systems (including sustainability assessments) from throughout the world: see reference 5; see also reference 13.

Practical element:

16.5 Students to give a personal account whether integration is desirable or not.

Taking HEC requirements into account, the following three main aspects of assessment are taken into account:

- Students to write a seminar paper compiling the various practical elements as outlined in the curriculum above;
- Students to give a short presentation on one or two aspects that they found particularly intriguing; and
- Students to sit for a written exam (set by lecturer/ teacher).

References for curriculum

- Key web-accessible sources

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    d) Course Module 10-2 - EIA as part of the decision process, http://eia.unu.edu/course/?page_id=99.
    e) Course Module 2-4 – EIA Requirements of International Organizations, http://eia.unu.edu/course/?page_id=111.
    f) Course module 4 – Screening, http://eia.unu.edu/course/?page_id=30.
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4. EIA course curricula for training of administrators and teachers

The course curriculum outline provided in section 3 is organised in terms of 16 themes, each of which including both, a lecture element and a practical element. While its use in a standard 2+1 University course should therefore be straightforward, it can also be adapted to other course situations, e.g. for two 2+1 courses.

Training of administrators and teachers which would cover all sixteen topics fully would require a minimum of about eight training days, each lasting eight hours with each theme taking up half a day. However, considering time pressures and other commitments of administrators and teachers, it is more realistic to assume that an intensive EIA training would be organised over e.g. four full days. Subsequently, outlines are provided for four training days for both, administrators and teachers on EIA.

4.1 Training of administrators

Training of administrators should be practical and focusing on the basics of EIA. Using the curriculum from section 3, eight half day training sessions may be organised as follows:

1 What is EIA, what is it trying to achieve, what are its principles, what benefits can result from EIA if considered in decision making and where in the world is it applied?
   - Both lecture and practice elements as outlined in theme 1 should be fully covered.

2 Decision-making theory and practice and main environmental problems of the international community and Pakistan
   - Lecture elements should cover ‘actors interacting in the EIA process’, ‘organisational behaviour’ and ‘EIA as part of the decision making process from’ from theme 2; as well as ‘the environment: physical, biological and social aspects’, ‘existing and emerging environmental threats’ and ‘principles for environmental integration’ from theme 3. The practical element should focus around the exercise introduced in theme 2.

3 Legal EIA background and guidance on EIA in Pakistan
   - Both, lecture and practical elements as outlined in theme 4 should be fully covered.

4 Requirements of international development banks
   - Both, lecture and practice elements as outlined in theme 5 should be fully covered.

5 Screening / project categorization and scoping, consideration of alternatives and mitigation and follow-up, monitoring and auditing; the role of environmental and social management plans
   - Lecture elements should cover 'screening in Pakistan', 'screening checklists', 'scoping: what is it?', 'methods and techniques used in screening and scoping', 'scoping in Pakistan', 'identification of suitable alternatives for use in EIA', 'avoiding environmental impacts', remedial action', 'criteria for successful implementation', 'who is involved in EIA follow-up?', 'when and how to do follow-up' and 'Pakistani specific technical requirements'; the practical element should be conducted as a combination of 'the determination of the EIA scope for a hypothetical project in Pakistan' from theme 6 and the 'development of suitable alternatives for EIA in different sectors' from theme 9.

6 Public participation and consultation and EIA reporting; EIA report quality reviews
   - Lecture elements should cover an 'explanation of the key role of public participation and consultation in the EIA process', 'participation and consultation techniques and their suitability for different situations, 'trans-boundary considerations' and .'public participation in Pakistan' from theme 7, as well as an 'explanation of the importance of EIA Review', and the 'introduction of an EIA review package' from theme 9; the practical element should focus on the quality review of an EIA statement, possibly from Pakistan, as outlined in theme 9.

7 Studying a specific EIA
   - This can be run as a combined lecture and practical over half a day as outlined in theme 12; ideally, a practitioner or public servant would report on an EIA and take students into the field, explaining positives and negatives of a development from an EIA point of view and how EIA influenced decisions.

8 Strategic environmental assessment
   - Lecture elements should cover 'introduction to SEA, explain what it is and how it differs from EIA', 'principles of SEA and different SEA approaches', 'introduction to a tiered approach to SEA', 'present the specific challenges when applying SEA at policy levels of decision making', as well as at least one policy SEA, plan SEA and programme SEA case study; the practical element should focus on 'a reflection on the way in which policies, plans and programmes are prepared in Pakistan and how SEA may fit into existing procedures.

4.2 Training of teachers

Training of teachers should be practical and focusing on more advanced aspects of EIA application. Using the curriculum from section 3, eight half day training sessions may be organised as follows:

1 What is EIA, what is it trying to achieve, what are its principles, what benefits can result from EIA if considered in decision making and where in the world is it applied?
   - Lecture elements should cover 'principles of EIA', 'scope, purposes and benefits of EIA', 'different legal, administrative and policy frameworks internationally' 'context specific applications', 'actors interacting in the EIA process',

'organisational behaviour', decision making models' and 'influences on decisions', as outlined in themes 1 and 2; the practical element should focus on students researching other decision making support tools and find out how they differ, as outlined in theme 1.

2 Legal EIA background and guidance on EIA in Pakistan and requirements of international development banks

- Lecture elements should focus on 'legislation' and 'guidelines', as outlined in theme 4 and 'World Bank and other Development Bank practices', as outlined in theme 5; the practical element should focus on establishing whether EIA is required for hypothetical projects, as described in theme 4.

3 The EIA process: screening, scoping, monitoring, follow-up and auditing

- Lecture elements should focus on 'introducing types of screening', 'purposes, objectives, guiding principles', 'ways of undertaking scoping, 'criteria of good scoping practice', 'methods and techniques used in scoping', as outlined in theme 6; 'who is involved in EIA follow up and how do you do it', 'what are barriers and enabling factors for EIA follow-up' and 'Pakistani specific technical requirements, as outlined in theme 10; the practical element should focus on taking training participants to a local field visit of a project for which EIA had been done, as is outlined in theme 10.

4 Baseline data collection and presentation, identification of impacts, consideration of alternatives and mitigation in EIA and EIA report quality reviews

- Lecture elements should focus on the 'types of alternatives that can be considered', 'identification of suitable alternatives for use in EIA', to 'establish the importance of avoidance, mitigation, as well as compensation measures', as outlined in theme 8, the 'introduction of EIA quality review packages', and the introduction of some 'real' good practice reports', as outlined in theme 9; the practical element should revolve around doing an EIA quality review and discussing results, as outlined in theme 9.

5 Public participation and consultation in EIA

- Both lecture and practical elements as outlined in theme 7 should be fully covered

6 EIA effectiveness

- Both lecture and practical elements as outlined in theme 13 should be fully covered.

7 Strategic environmental assessment (SEA)

- Lecture elements should focus on 'how SEA differs from EIA', 'potential benefits of SEA', 'principles of SEA and different SEA approaches', and 'introduction of a tiered approach to SEA' as outlined in theme 14; 'introduction to policy level SEA' and 'specific challenges with applying SEA at the policy level', as outlined in theme 15, case studies, as outlined in themes 14 and 15 should also be presented; the practical element should focus 'on the way in which policies, plans and programmes are prepared in Pakistan and how SEA may fit into existing procedures, as outlined in theme 15.

8 Developing EIA and SEA further: Integrated and sustainability assessments

Both, lecture and practical elements as outlined in theme 16 should be fully covered.

5. Recommendations for further action

In this part of the report, recommendations for further action are made. These are mainly based on the results of the various surveys introduced in part 1 and the 2nd workshop introduced in part 2 of this report. First some medium term action points are introduced, before long term action points are outlined.

5.1 Medium-term action points

This section is sub-divided into three parts; the first dealing with the idea of an EIA Handbook for Pakistan; the second with an EIA lecturers' training initiative; and the third with international exchange programmes for EIA academics.

5.1.1 EIA Handbook for Pakistan and further publications on EIA practice

An initiative for an edited EIA Textbook for Pakistan has been started. Table 4 presents the names of those who have expressed an interest in contributing to this handbook. Further names will be sought and a possible publisher from Pakistan will be identified. The initiative will be led by Thomas Fischer. Depending on the publisher, some initial financial contribution may need to be made for a first edition. An application has been made to the University of Liverpool for a 'knowledge exchange voucher' scheme for work worth £10,000, which, if rewarded, would be able to pay a researcher to support Thomas Fischer editing the handbook.

In addition to the handbook, suitable chapters can also be transformed into potential journal papers. Furthermore, chapters could also find their way into a special issue of e.g. the ISI listed Journal of Environmental Assessment Policy and Management.

5.1.2 An EIA lecturers' training initiative

An EIA lecturers' training initiative could be supported within the current NIAP set-up. This may involve training sessions of four days, as outlined in section 4.2 above in e.g. each of the Pakistani provinces.

5.1.3 Encouraging / supporting international exchange programmes for EIA academics

Existing academic exchange programmes (e.g. DAAD, British Council) are the starting point here. There may also be scope for an application within the European Erasmus Mundus programme; other Pakistani options should also be explored. NIAP could potentially also play a supporting role for starting

academic exchange by providing some funds. As an immediate action connected with NIAP, the Head of the Department of Geography and Planning of Liverpool University and the Head of the Department of City and Regional Planning of the University of Engineering and Technology in Lahore have signed a Memorandum of Understanding for an exchange programme between both institutions.

5.2 Long-term action points

5.2.1 Initiative for strengthening consultancy / industry – university links

Linking up with industry will be crucial for improving the effectiveness of the EIA system. Government contracts with consultancies can include a need for guest lectures on projects in universities and/or for guiding students in the field; Federal Government, EPA Pak, provincial EPAs and industry / consultancies need to be involved.

5.2.2 Improving existing EIA courses in terms of:

- more practical work should be encouraged; e.g. supporting a move from 3+0/4+0 to 2+1 / 3+1 courses; this will require active involvement of universities, faculties, departments and HEC;

- more interdisciplinary co-operation within universities should be encouraged; how this is to be achieved is unclear and based on survey results, it is likely that there may be quite a few barriers in the current system towards this; this will require active involvement of academic councils of universities and HEC; in this context, how more teaching in non-science, non-engineering departments may be encouraged to teach EIA needs to be explored; and

- SEA should become a 'routinely' covered part in EIA courses, along with some other currently poorly covered topics (e.g. techniques, such as overlays, LCA, MCA, modelling), dealing with uncertainty, environmental economics, environmental politics); this will require mainly professors, lecturers and teachers to update their teaching materials.

5.2.3 Introducing accredited one-year University Diploma Programmes in EIA

- It would be desirable to have at least one university in each province offering accredited one-year University Diploma Programmes in EIA. This will require active involvement of universities - academic councils, syndicates, senates; faculties (boards) and departments (boards of studies), possibly the Ministry of Climate Change (as accreditation body?), EPA Pak (as accreditation body), the HEC and provincial EPAs (as accreditation bodies?); based on survey results, the EA Lecturers' Handbook (Fischer et al, 2008) could provide a template for this.

5.2.4 Encouraging the creation of an independent professional body for both, the instrument of EIA and accreditation

- There are different options/models for this, including e.g.:
  (1) a more formal, institutionalised and strong EIA body like the Dutch EIA Commission or the Canadian Environmental Assessment Agency;
  (2) a more informal, but institutionalised body, like the UK IEMA, which also accredits university programmes; or
  (3) an independent association, like the German EIA Association which doesn't currently accredit courses, but gives advice and recommendations, if asked.

- All major players involved in EIA in the country need to co-operate on this, e.g. the Ministry of Climate Change, EPA Pak, the HEC and provincial EPAs, universities and their academic councils, EIA university teachers as well as the EIA industry; an EIA body which serves as accreditation body from another country could act as an 'advisory board'.

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Annexure I

Tertiary Level EIA Teaching Institutions
that were / were not contributing to surveys and attending workshops

	University	*Contributed to:*
1	Bahria University, Islamabad	Previous survey Pre-workshop survey Workshop surveys
2	Allama Iqbal Open University, Islamabad	-
3	COMSATS IIT Abbottabad Campus	Pre-workshop survey Workshop surveys 2nd workshop attendance
4	National University of Science & Technology	Workshop surveys 2nd workshop attendance
5	International Islamic University, Islamabad	Pre-workshop survey Workshop surveys
6	Quaid-e-Azam University, Islamabad (QUEST)	Previous survey Pre-workshop survey Workshop surveys
7	Karakoram International University	-
8	PMAS Arid Agriculture University, Rawalpindi	Previous survey Pre-workshop survey
9	Fatima Jinnah Women University, Rawalpindi	Pre-workshop survey
10	Punjab University, Lahore	Previous survey Pre-workshop survey 2nd workshop attendance
11	Bahauddin Zakariya University, Multan	Previous survey
12	University of Gujrat, Gujrat	Previous survey
13	University of Engineering and Technology, Taxila	-
14	University of Engineering And Technology, Lahore	Pre-workshop survey Workshop surveys 2nd workshop attendance
15	Lahore College for women University, Lahore	Previous survey Pre-workshop survey Workshop surveys 2nd workshop attendance
16	Government College University, Lahore	Previous survey Pre-workshop survey Workshop surveys 2nd workshop attendance

	University	***Contributed to:***
17	Government College University, Faisalabad	Previous survey Pre-workshop survey Workshop surveys 2nd workshop attendance
18	Kinnaird college for women, Lahore	Previous survey 2nd workshop attendance
19	University of Karachi	Previous survey 2nd workshop attendance
20	University of Sindh, Jamshoro	-
21	NED University of Engineering & Technology, Karachi	Pre-workshop survey Workshop surveys
22	Quaid-e-Awam University of Engineering, Sciences & Technology, Nawabshah	Previous survey 2nd workshop attendance
23	Mehran University of Engineering and Technology, Jamshoro	Previous survey Pre-workshop survey Workshop surveys 2nd workshop attendance
24	SUPARCO, Karachi campus	Previous survey
25	University of Peshawar	Previous survey Workshop surveys
26	Sardar Bahadur Khan Women University, Quetta	Pre-workshop survey Workshop surveys 2nd workshop attendance
27	University of Balochistan	Previous survey 2nd workshop attendance
28	Balochistan University of Information Technology, Engineering and Management Sciences	Previous Survey
29	Bahria University Karachi Campus	Previous survey
30	The Islamia University of Bahawalpur	-
31	Sir Syed University	Pre-workshop survey
32	University of Agriculture, Faisalabad	Previous Survey
33	University of Sargodha	Previous survey 2nd workshop attendance
34	Ghulam Ishaq Khan Institute of Eng. Sciences & Technology	2nd workshop attendance
35	University of the Punjab	2nd workshop attendance

Annexure II

Questionnaire Survey before the Workshop

Questionnaire: EIA teaching in tertiary education institutions in Pakistan

(a) Your name and contact details (email)

(b) Faculty and Department (o. equivalent) within which EIA is taught:

(c) EIA is taught:

1. As a full degree programme (please go to (d) *section I*) ☐
2. As a major part (more than one course) in another degree programme (please first go to (c) 4. and then go to (d) *section II*) ☐
3. As a minor part (e.g. one course or less) in another degree programme (please first go to (c) 4. and then go to (d) *section III*) ☐
4. Through individually chosen coursework (ie papers, seminar presentations or dissertations) the extent to which EIA is covered in a specific degree programme can substantially increase. ☐

Please explain further:

(d) *Section I*

1. Please specify whether this is an undergraduate or postgraduate academic or professional degree programme:
   Undergraduate ☐ postgraduate ☐ academic ☐ professional ☐
2. Please state the title of the degree programme
3. Please outline the structure of the degree programme
   a. Number of years the degree programmes takes
      1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
      Other (please state): ☐
   b. Number of courses and credits per year, specifying the names of courses (and indicating what main topic(s) is (are) covered), types of courses (lecture, seminar, practical, placement, project or other) and types of assessment (written output; written or oral examinations; group work; presentation; other (please specify)).

Courses offered (names and topics) and associated credits:

1:	2:	3:
4:	5:	6:
7:	8:	9:

Type of course and type of assessment:

1:	2:	3:
4:	5:	6:
7:	8:	9:

4. If possible, please name the key literature (author, title, year and publisher) underlying the EIA part of the degree programme.

(d) *Section II*

1. Please specify whether this is an undergraduate or postgraduate academic or professional degree programme

   Undergraduate ☐ postgraduate ☐ academic ☐ professional ☐

2. Please state the title of the degree programme

3. Regarding the courses taught on EIA, please state:
   a. The titles of the courses and *main* topics covered and the year in the degree programmes they are offered

   b. Type of courses (lecture, seminar, practical, placement, project or other) and type of assessments (written output; written or oral examinations; group work; presentation; other (please specify)).

   c. The approximate number of teaching / learning hours consciously spent on EIA and associated credits

4. If possible, please name the key literature (author, title, year and publisher) underlying the EIA course(s).

(d) Section III

1. Please specify whether this is an undergraduate or postgraduate academic or professional degree programme

   Undergraduate ☐ postgraduate ☐ academic ☐ professional ☐

2. Please state the title of the degree programme

3. Regarding the course or the part of the course taught on EIA, please state:

   a. The title of the course, main topics covered and the year in the degree programme it is offered

   b. The type of course (lecture, seminar, practical, placement, project or other) and type of assessment (written output; written or oral examinations; group work; presentation; other (please specify)).

   c. The approximate number of teaching / learning hours consciously spent on EIA and associated credits

4. If possible, please name the key literature (author, title, year and publisher) underlying the EIA course(s).

(e) In the following table, please tick what is you think applies to your EIA teaching (more than one ticks per line possible)

EIA Topic	Currently well covered	Currently covered,but not well	Needs to be covered	Should be (better) covered	Not essential
1. EIA Legislation					
2. EIA Guidance					
3. The theory of EIA					
4. EIA history					
5. EIA procedural stages					
6. Alternatives in EIA					
7. Cumulative impacts in EIA					
8. Public participation in EIA					
9. Overlay mapping					
10. Life-cycle assessment					
11. Uncertainties					
12. Impact significance					
13. Mitigation/compensation of impacts					
14. Multi-criteria analysis					
15. Modelling					
16. Environmental planning / protection					
17. Environmental integration					
18. Development planning					
19. Trade-offs (e.g. economic vs. environm.)					
20. Systems for env. Management					
21. Organisational behaviour/decision making					
22. Environmental science					
23. Strategic environmental assessment - SEA					
24. Environmental economics					
25. Geographical information science –GIS					
26. Environmental politics					
27. Ecology / biodiversity					
28. Environmental engineering					
29. Bio-physical impacts					
30. Health impacts					
31. Social impacts					
32. Cultural impacts					
33. Economic impacts					
34. Indicators and reporting					
35. Sustainable development					

What important aspect(s) do you think are not mentioned above?

(f) Please add what you think is of particular importance for teaching on EIA in Pakistan

Many thanks for your time!

If you have any questions, please contact Prof Thomas Fischer at fischer@liv.ac.uk

Annexure III

Questionnaire for Evaluating 'EA Lecturers' Handbook'

Questions for EIA tertiary level education experts from Pakistan on the EA lecturers' handbook

Your name, institutional affiliation and contact email

_____

_____

_____

_____

Please note: For any of the subsequent questions, more than one ticks are possible

(1) Chapters 2 to 5 are written from a European perspective. Are they still useful to a Pakistani audience?

Yes ☐ somewhat ☐ No ☐ Don't know ☐

Comments: _____

_____

_____

_____

_____

(2) Do you think a similar endeavour (ie establishing the EIA educational context as in chapters 2-5) would also be useful for Pakistan?

Yes ☐ somewhat ☐ No ☐ Don't know ☐

Comments: _____

_____

_____

_____

_____

(3) Can you score each of the chapters 6 to 10, then 11-12 and 13-18 of the EA lecturers' handbook in terms of being highly relevant, relevant, somewhat relevant and not relevant to a Pakistani audience, and if possible provide the reasons of your judgement / make recommendations for necessary changes

Ch	Highly relevant	relevant	Somewhat relevant	Not relevant	Reasons	Recommendations for changing the chapter to make it more relevant
6						
7						

8						
9						
10						
11-12						
13-18						

(1) Do you think the 'common curriculum' which presents teaching materials for core modules of higher education EIA degree programmes (chapters 6-10) would also be an applicable template for Pakistan?

Yes ☐ Yes, + other materials ☐ partly ☐ No ☐ Don't know ☐

Please explain, in particular what parts of the handbook are applicable or what other materials would be necessary

(2) Overall, what suggestions do you have for making the EA lecturers' handbook more attractive to a Pakistani audience?

(3) Do you have any additional comments / criticism / recommendations

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