

*Pir Mehr Ali Shah*

# Arid Agriculture University Rawalpindi



Self Assessment Report

3<sup>rd</sup> Cycle (2010-2012)

M.Sc. Wildlife Management

## Department of Wildlife Management

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## INTRODUCTION

The Department of Wildlife Management was established in 2007 at Pir Mehr Ali Shah Arid Agriculture University Rawalpindi with a mandate to carry out teaching and research on various aspects of wildlife, suggesting measures for conservation of wildlife populations and their habitat, especially focusing on threatened species, management of protected areas and wetlands, and management of human-wildlife conflict. The department is offering postgraduate degrees of M.Sc., M. Phil. and Ph.D. in wildlife management. There was enrollment of 19 students in M.Sc. programme during the period under current report. This is a 2 year degree with minimum requirement of 60 credit hours based on taught courses and a research report.

The taught courses are chosen from extensive scheme of study (consisting of more than 30 courses) which has been developed for post graduate degree programme in the field of wildlife management, covering the major aspects such as wildlife study techniques, wildlife population, management, diseases and captive breeding, management of protected area, wetlands hoosand terrestrial habitats, wildlife policy, laws, conservation strategies and conventions, wildlife damage management, threatened species management, etc. The courses are supported by latest text books and research publications.

The research facilities have been established both in the field as well as in the laboratory. Necessary field equipments required for conducting wildlife research studies have been procured under HEC funded development and research projects as well as university funded research projects. This includes; live traps, nets, binoculars, spotting scopes, cameras, GPS, camping gear, glassware, refrigerators, ovens, deep freezers, chemicals, etc.

A development project on “Strengthening the Department of Wildlife Management” funded by HEC amounting to Rs 36.141 m for a period of two years is in progress. Most of the field and laboratory research equipment, glassware, chemicals, books, and other items have been purchased under this project.

A research project on “Baseline studies on wildlife diversity in selected protected areas of Pakistan” funded by HEC for a period of three years (2009-12), amounting to Rs. 1.364 m has been completed and final progress report has been submitted to HEC which has been approved. Another research project “Eology of Indian pangolin (*Manis crassicaudata*) in Potohar region” funded by HEC amounting to Rs. 2.158 m is in progress.

As per policy of the university, lectures and assistant professors level faculty members are eligible to submit research projects for funding from university’s own resources. Under this scheme, the relevant faculty members of this department have completed one research projects during 2010-11 (Rs. 0.1397m). Another research study with allocation of funds of Rs. 0.136 m is currently in progress.

About 200 books related to the subject of wildlife management and conservation have been purchased and placed in the university library for ready reference to the students. In addition, students are encouraged to get electronic copies of latest research papers related with their area of research by contacting relevant authors, institutions, publishers, etc.

This Self Assessment Report (SAR) is based on eight criteria. The first criterion outlines the program mission and objectives. Criterion 2 provides information about the curriculum development. Criterion 3 enlists the laboratories and other relevant information. The fourth criterion is pertinent to the information about students' support and advising. The last four criteria provide information about process control, faculty characteristics and institutional facilities and support.

## CRITERION 1: PROGRAM MISSION, OBJECTIVES AND OUTCOMES

### Standard 1.1. The program must have measurable objectives to support Mission

**Mission Statement:** To deliver quality education on various aspects of wildlife and its habitat including identification, distribution ecology, biology and management for the conservation of this precious biological resource of Pakistan.

#### Objectives:

1. To impart education and training to students in the field of wildlife science to make them able to understand and address the issues related to wildlife management.
2. To impart conservation education and awareness about wildlife resources of Pakistan.

#### Main elements of strategic plan to achieve mission and objectives:

- Development of sound teaching baseline from latest available literature, reviews, field experiences, symposia, workshops, etc. for the award of degree.
- Designing of curricula including core subjects, elective subjects and study tours.
- Setting up laboratories for the students; depending upon the available resources.
- Arranging study tours to impart first-hand knowledge to students about wildlife identification and management.
- Development of scientific writing and presentation skills through assignments and research reports.

The assessment of the program objectives through different criteria is presented in Table 1

**Table 1. Program Objectives Assessment**

S. #	Objective	How Measured	When Measured	Improvement Identified	Improvement made
1	To impart education and training to students in the field of wildlife science to make them able to understand and address the issues related to wildlife management.	Knowledge of students about the subject through exams and students feedback from assessment proformas	During the semesters' examinations	Courses to be updated regularly by inducting new knowledge/ techniques & also induct new courses	Revision of curriculum and induction of new courses in 2009
2	To impart conservation education and awareness about wildlife resources of Pakistan	Assessing students knowledge through quizzes, papers, assignments	During mid, final exams, presentation of assignments, field visits	Updating contents of courses and induct new courses	Revision of curriculum and induction of new courses in 2009

## PROGRAM LEARNING OUTCOMES

Students of M.Sc. should possess the ability of:

- Identification of wildlife species, their habitats and distribution in Pakistan
- Identification of wildlife management issues and suggest appropriate solutions

- Scientific writing and communication skills through presentations, oral discussions, scientific reports, etc.

Questionnaire surveys were conducted to assess program outcomes of the department / graduates for M.Sc. (Table 2).

**Table 2. Relationship of Program Objectives with Program Outcomes**

Program Objectives	Program Outcomes		
	Wildlife species identification skills	Problem solving / management skills	Scientific writing & communication skills
Wildlife management	+++	++	++
Conservation education/ awareness	++	+	++

+ = Moderately satisfactory

++ = Satisfactory

+++ = Highly satisfactory

### PROGRAM ASSESSMENT RESULTS:

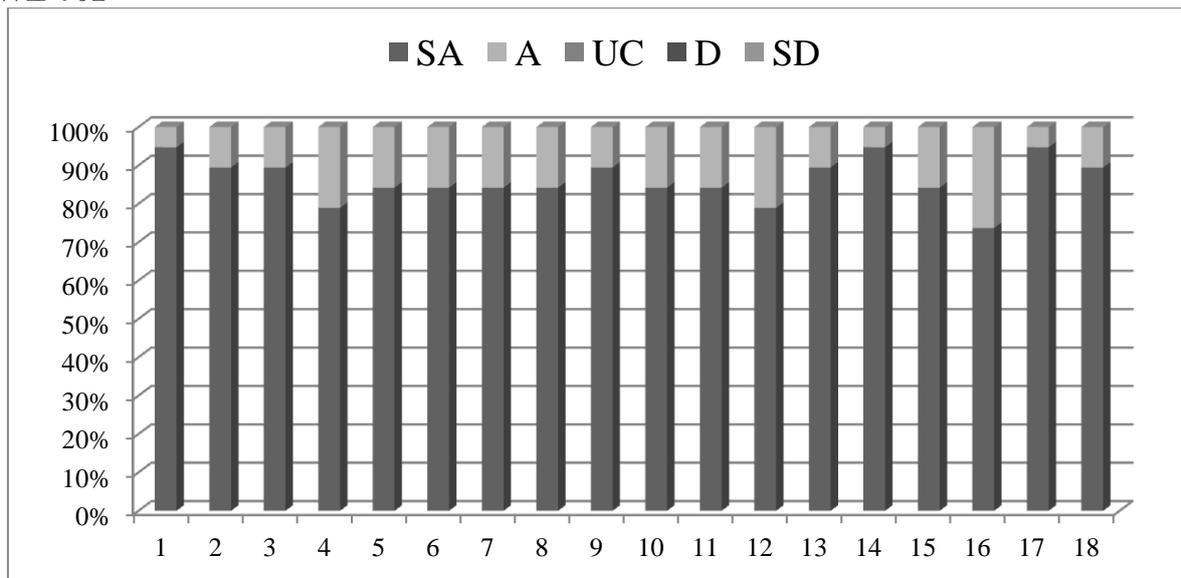
#### Teacher's evaluation

Four teachers of the department teach classes to M.Sc. students namely:

1. Dr. Iftikhar Hussain Professor
2. Dr. Tariq Mahmood Assistant Professor
3. Dr. Muhammad Rais Lecturer
4. Ms. Bushra Allah Rakha Lecturer

The teachers were evaluated by the students at the end of course completion through proforma-10 (Annex-II). Detail of performance of each teacher is given in Figs. 1-13.

#### WL-701



**Key:** SA=Strongly Agree, A=Agree, UC=Uncertain, D=Disagree, SD=Strongly Disagree

Fig. 1. Teacher Evaluation for WL-701 during Fall-2011

**Comments:**

**Instructor:** Teacher was loyal to subject, regular and completed the syllabus, kind to students, communicates the subject effectively.

**Course:** Increased knowledge about wildlife distribution and helpful in research, More field surveys needed, tell about eco-zones of Pakistan.

**WL-702**

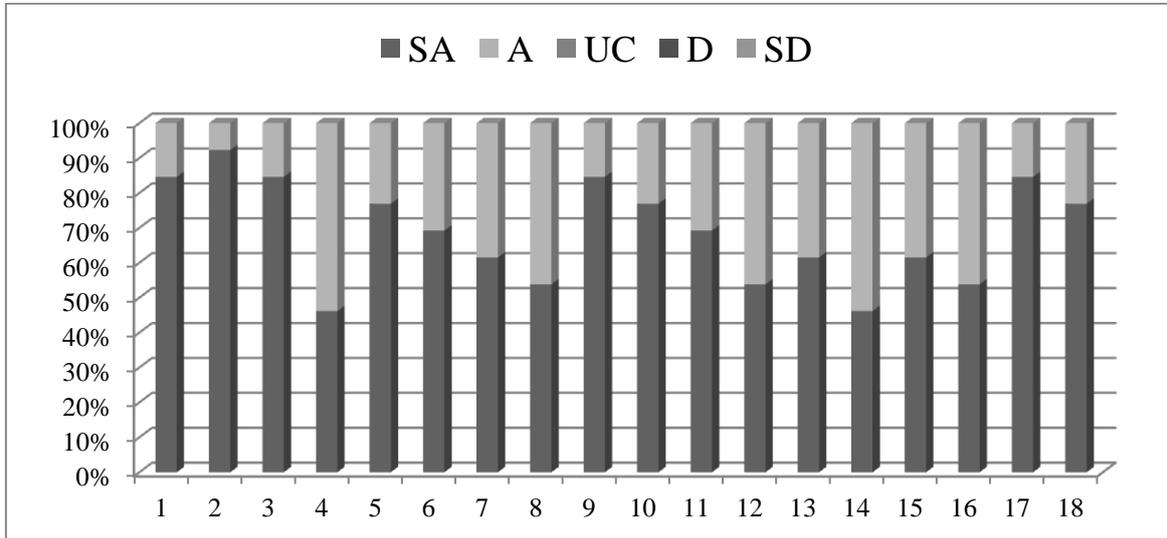


Fig. 2. Teacher Evaluation for WL-702 during Fall-2011

**Comments:**

**Instructor:** Teacher is intelligent and has full grip of knowledge, cooperative and helping, regular.

**Course:** Not very interesting but a little bit confusing, informative, interesting and helpful, descriptive, updated and manageable.

**WL-706**

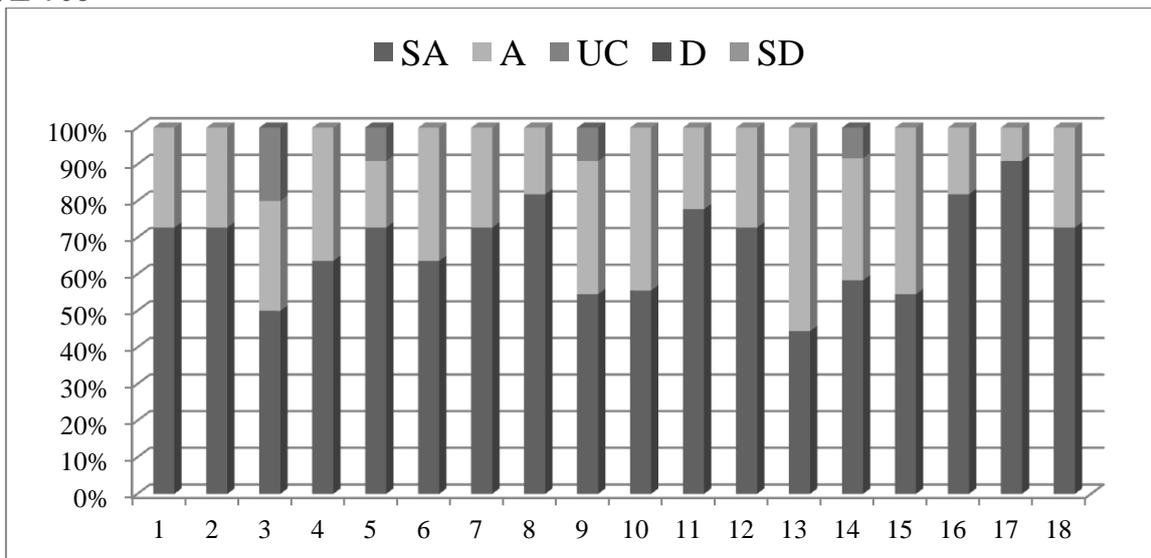


Fig. 3. Teacher Evaluation for WL-706 during Fall-2010

**Comments:**

**Instructor:** Very helpful, hardworking, explained the course well. Teaching method was good. Teacher was fully prepared and punctual.

**Course:** Too lengthy but informative, handouts not manageable due to shortage of time, very interesting. More field tours needed.

**WL-707**

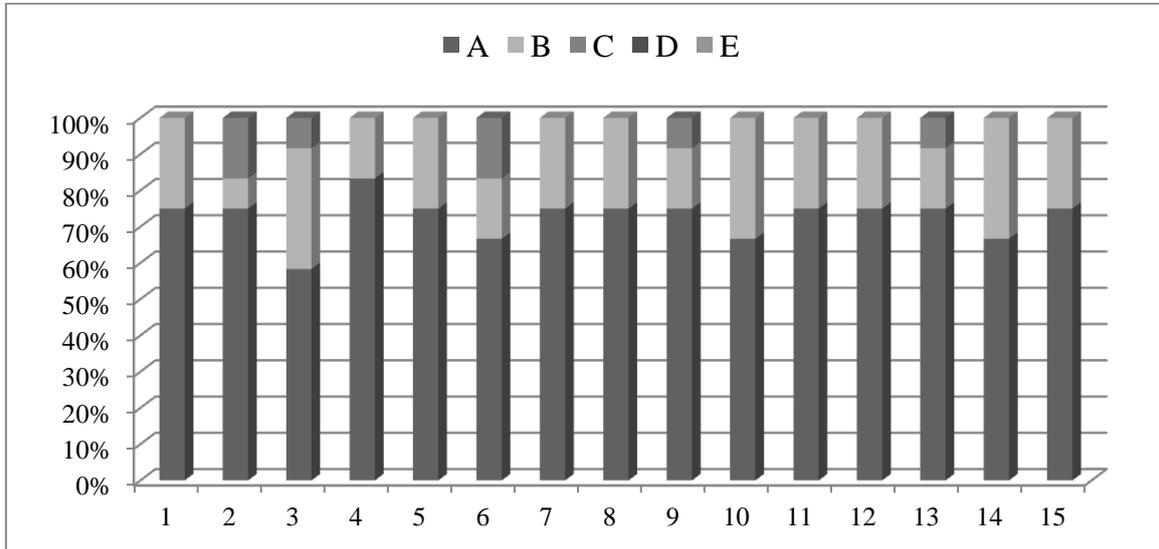


Fig. 4. Teacher Evaluation for WL-707 during Fall-2011

**Comments:**

**Instructor:** Dutiful and punctual.

**Course:** The course was good.

**WL-708**

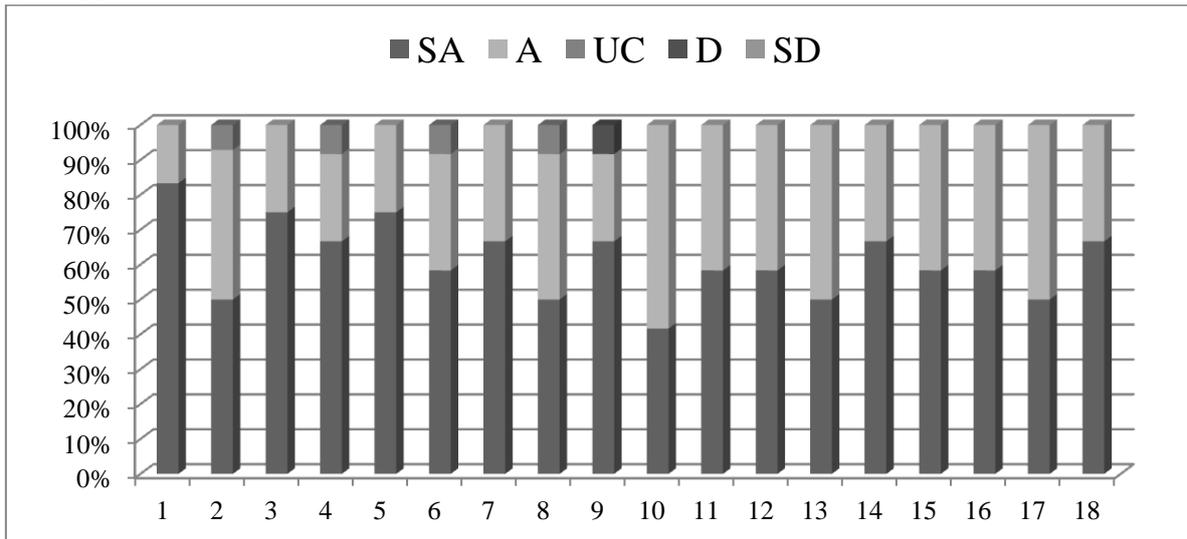


Fig. 5. Teacher Evaluation for WL-708 during Spring-2011

**Comments:**

**Instructor:** Teacher cleared the contents, gave up to date knowledge and modern techniques for damage management. He has full hold on subject, is cooperative and provided learning environment.

**Course:** Course was manageable, increased knowledge of the subject, field surveys and visits needed to understand. Informative but needs improvement.

**WL-709**

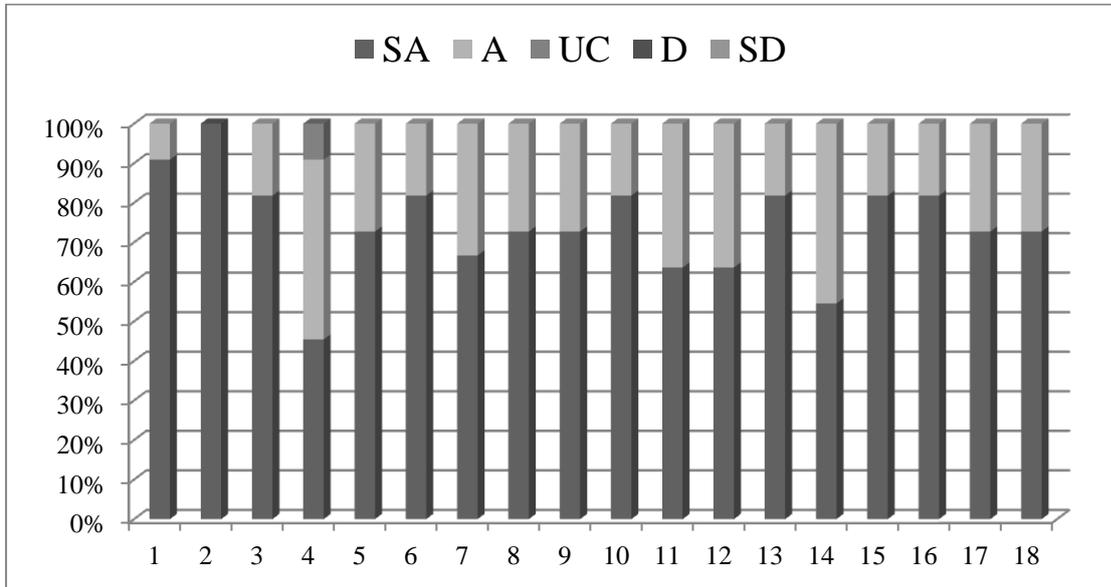


Fig. 6. Teacher Evaluation for WL-709 during Spring-2011

**Comments:**

**Instructor:** Good teaching method, helpful, punctual, fully prepared for every lecture, nice behavior with students.

**Course:** Very interesting, informative, knowledge-full but too lengthy.

**WL-711**

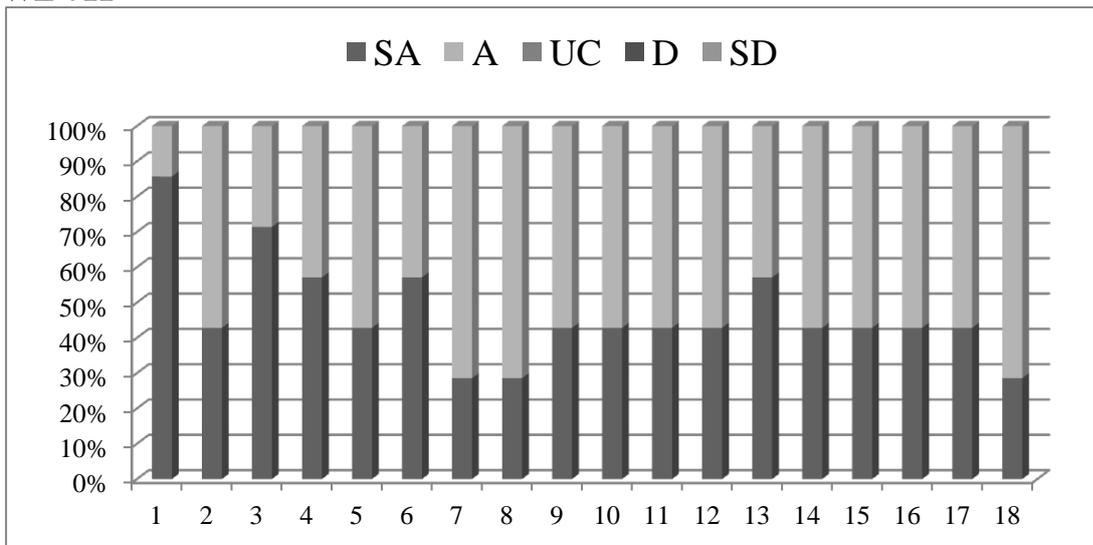


Fig. 7. Teacher Evaluation for WL-711 during Fall-2011

**Comments:**

**Instructor:** He has command on the subject, describes the topics precisely, is committed, polite and helpful.

**Course:** Difficult but helpful for learning report writing. Practical part should be improved.

**WL-712**

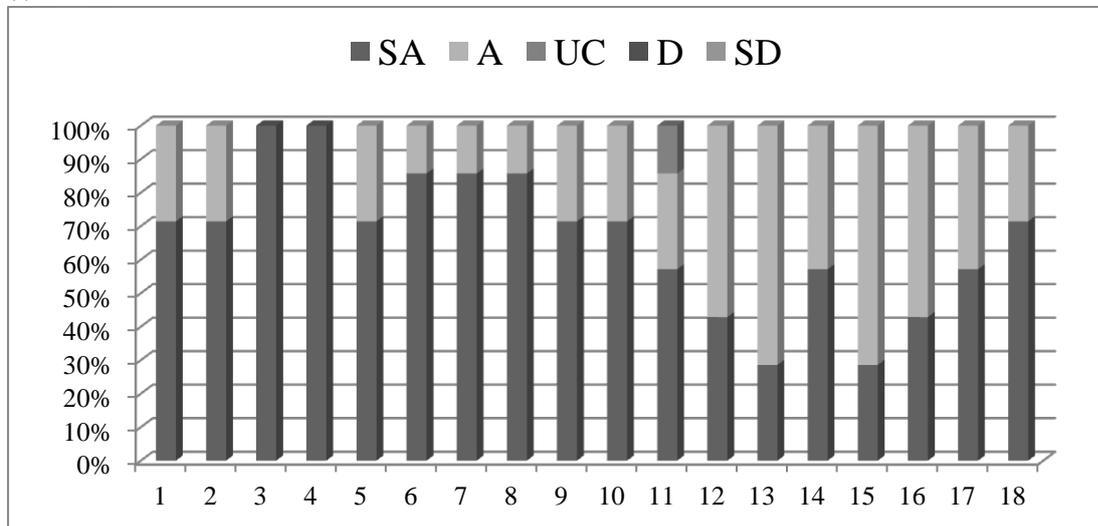


Fig. 8. Teacher Evaluation for WL-712 during Fall-2010

**Comments:**

**Instructor:** Committed, cooperative and helpful teacher with full grip on his subject. Fully prepared for the lectures.

**Course:** Modern and helpful to provide knowledge. Difficult and interesting course, books on subject to be provided.

**WL-714**

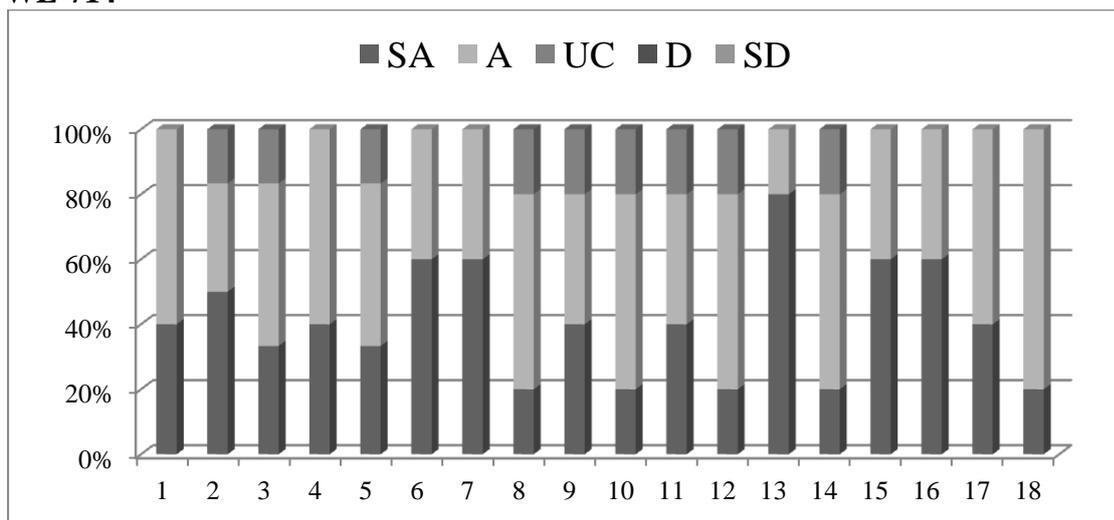


Fig. 9. Teacher Evaluation for WL-714 during Spring-2011

**Comments:**

**Instructor:** reasonably good and helpful, maintained good environment in the class,

**Course:** contents satisfactory, course manageable and understandable, good but difficult to understand.

**WL-716**

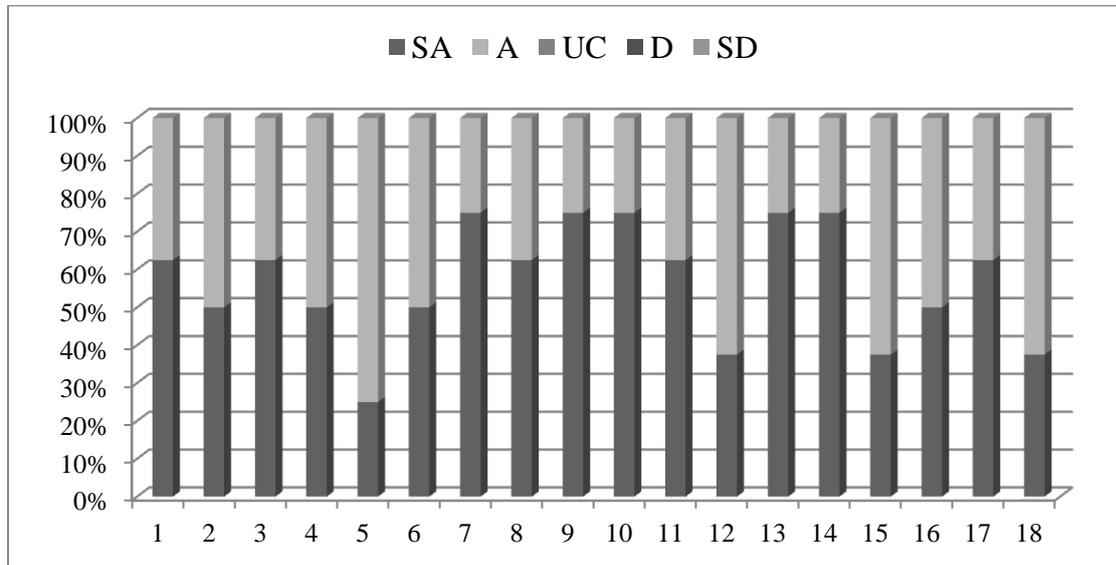


Fig. 10. Teacher Evaluation for WL-716 during Fall-2011

**Comments:**

**Instructor:** She is regular and hard working, provided conducive environment in the class and managed the course well. Friendly to students, teaching method was good.

**Course:** Course is very informative about fish fauna management of Pakistan, created interest in fish fauna, difficult but interesting, more field tours, more emphasis should be on Pakistan.

**WL-718**

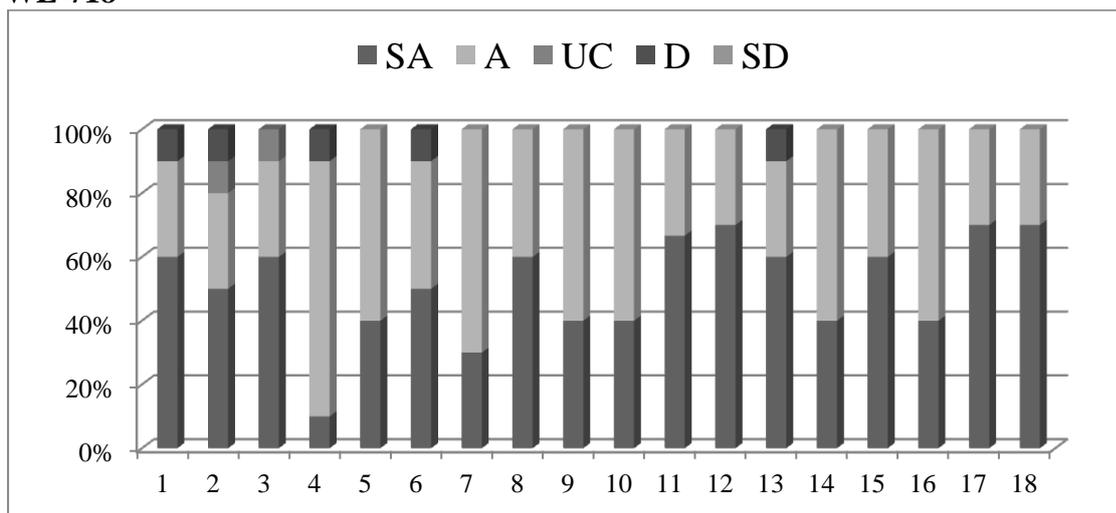


Fig. 11. Teacher Evaluation for WL-718 during Spring-2011

**Comments:**

**Instructor:** Regular and devoted to duty, hard working, way of teaching is good. Fully prepared for lectures.

**Course:** Course is good and informative, interesting.

**WL-726**

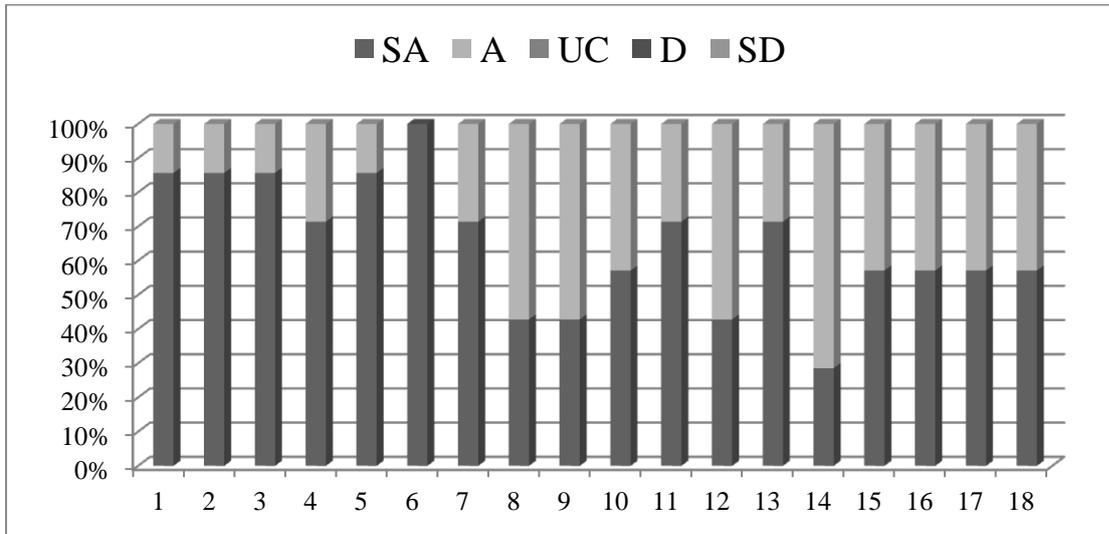


Fig. 12. Teacher Evaluation for WL-726 during Fall-2010

**Comments:**

**Instructor:** provided good knowledge about the subject and developed our interest in the subject, very cooperative. He has decent personality.

**Course:** course was interesting and informative, was relevant to meet needs of wildlife conservation.

**WL-729**

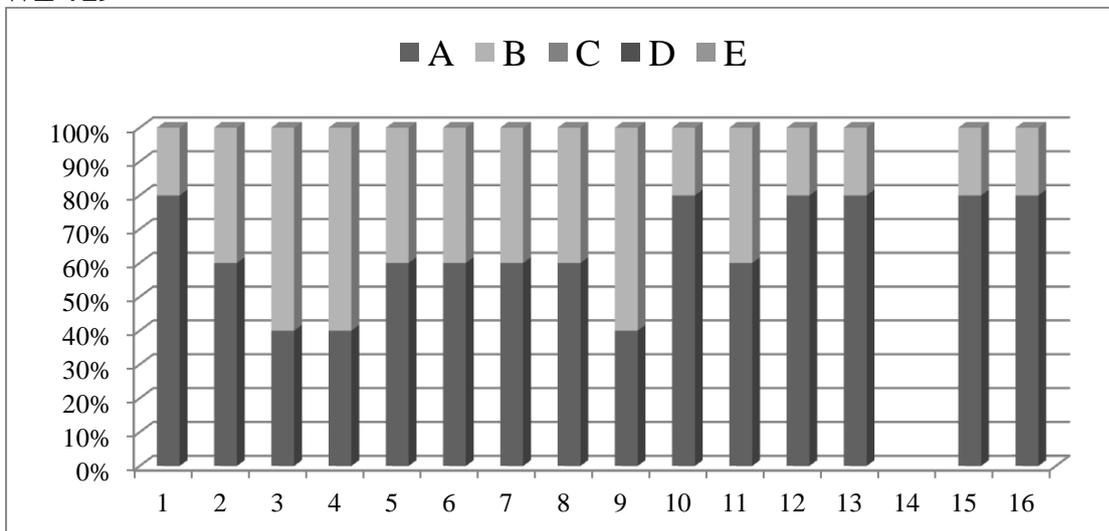


Fig. 13. Teacher Evaluation for WL-729 during Fall-2011

**Comments:**

**Instructor:** Very helpful, hardworking,

**Course:** Course well managed. More field visits needed. Course should be short.

## Course Evaluation

Courses offered during the report period (Table-3) were evaluated by the students at the end of course completion through proforma-1 (Annex-I). Detail of evaluation of each course is given in Figs. 14-26.

**Table 3. Courses offered and evaluated during Fall 2010 to Spring 2012**

#	Code	Course Title	Semester	Teacher
1	WL-701	An introduction to wildlife of Pakistan	Fall 2010	Bushra Allah Rakha
2	WL-702	Wildlife Population Ecology	Fall 2010	Dr. Tariq Mahmood
3	WL-706	Wildlife Management at Wetlands	Fall 2010	Muhammad Rais
4	WL-707	Terrestrial Wildlife Management	Spring 2011	Muhammad Rais
5	WL-708	Wildlife damage management	Spring 2011	Dr. Iftikhar Hussain
6	WL-709	Society, values and economics of wildlife	Spring 2011	Dr. Tariq Mahmood
7	WL-711	Research planning and report writing	Fall 2011	Dr. Iftikhar Hussain
8	WL-712	Conservation biology of wildlife	Fall 2010	Muhammad Rais
9	WL-714	Reproductive Biology and Breeding	Spring 2011	Bushra Allah Rakha
10	WL-716	Wild Fish Fauna of Pakistan	Fall 2010	Bushra Allah Rakha
11	WL-718	Captive wildlife management	Spring 2011	Bushra Allah Rakha
12	WL-726	Essentials of wildlife conservation-national perspective	Fall 2010	Muhammad Rais
13	WL-729	Biology and conservation of amphibians and reptiles	Spring 2011	Muhammad Rais

### WL 701

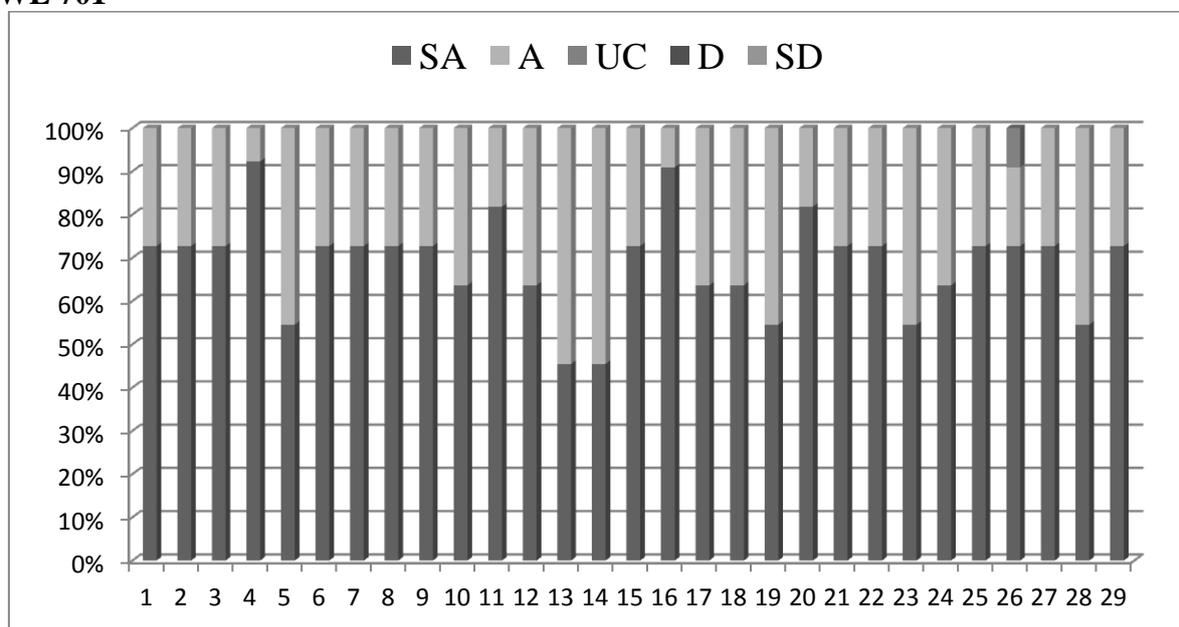


Fig. 14. Course Evaluation of WL-701 during Fall-2011

**General comments about the course:** The results revealed that students were satisfied with the course

**Strengths:** Study visits, quizzes, assignments, information.

**Weaknesses:** More field tours, presentations.

**WL-702**

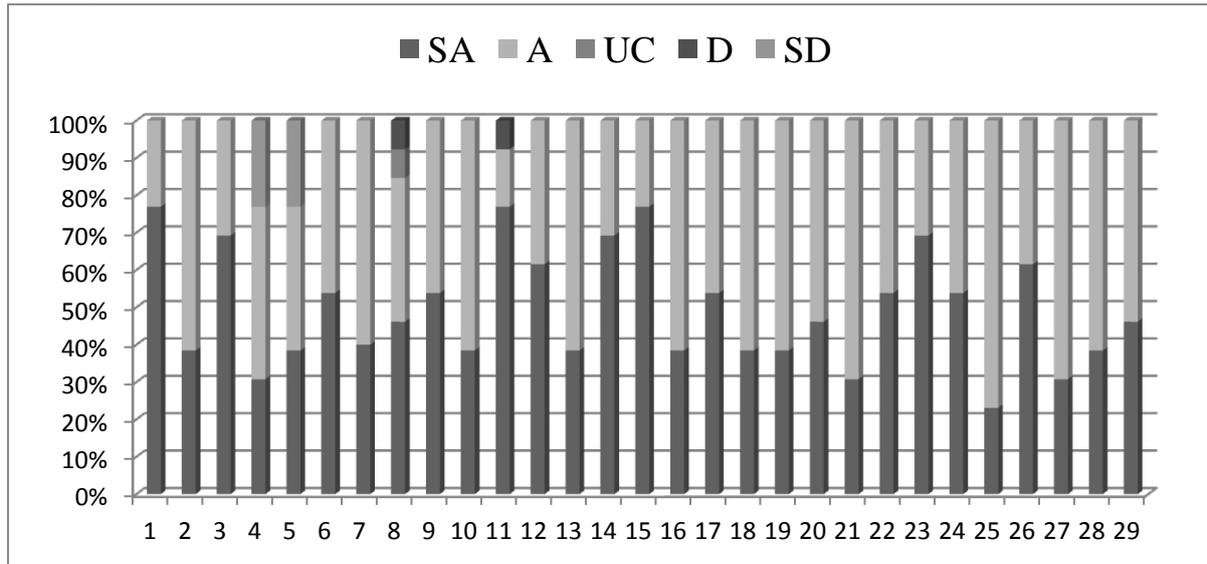


Fig. 15. Course Evaluation of WL-702 during Fall-2011

**General comments about the course:** The results revealed that students were satisfied with the course

**Strengths:** Information on population ecology, study visits.

**Weaknesses:** Field tours, practices.

**WL-706**

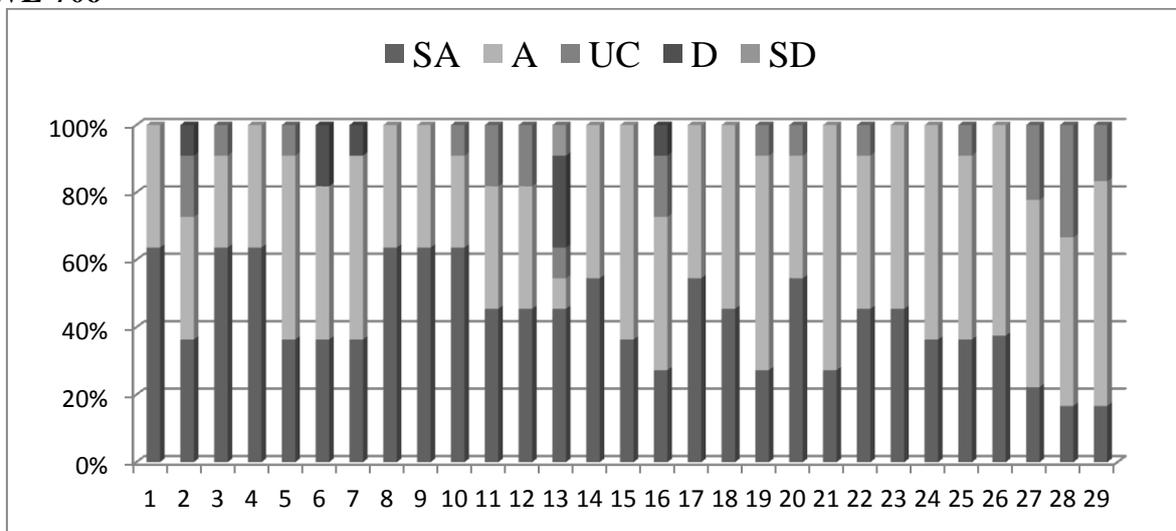


Fig. 16. Course Evaluation of WL-706 during Fall-2010

**General comments about the course:** The results revealed that students were satisfied with the course. However, about 8% showed disagreement on students contribution, assessment and quality of delivery.

**Strengths:** Well organized and easy to understand. Good knowledge on wetlands.

**Weaknesses:** Field tours to wetlands, more on management issues, practical work. Time management

### WL-707

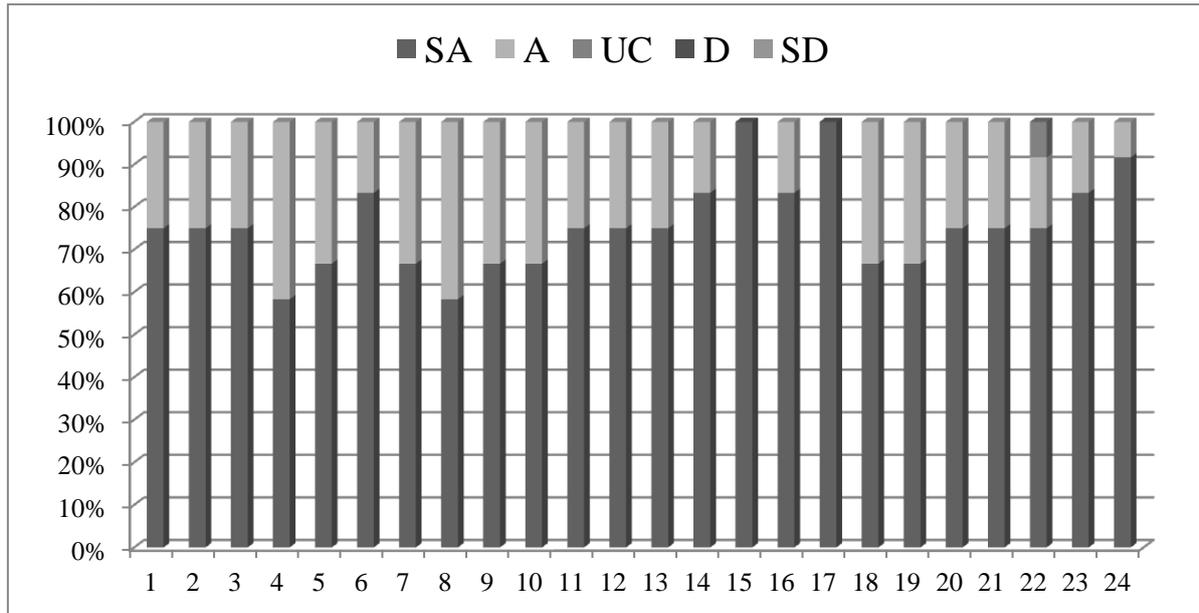


Fig. 17. Course Evaluation of WL-707 during Fall-2011

**General comments about the course:** The results revealed that students were satisfied with the course. However, 12% disagree with student’s contribution, 2-3% uncertain about course contents, learning resources and quality of delivery.

### WL-708

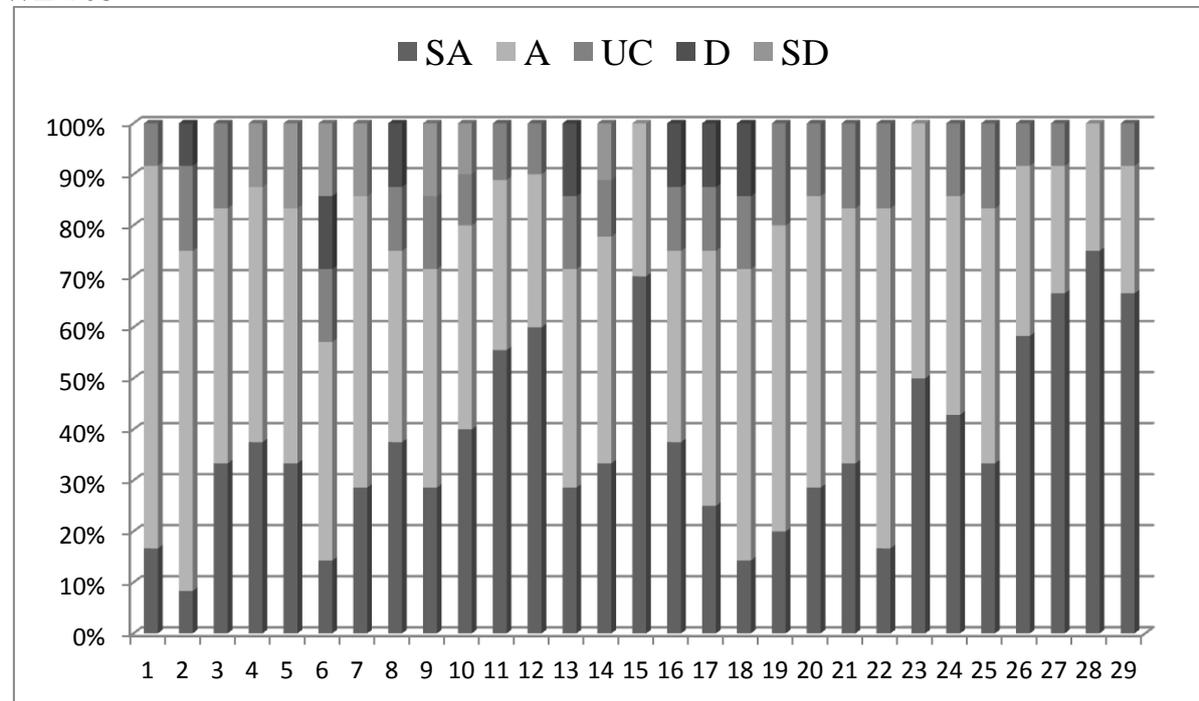


Fig. 18. Course Evaluation of WL-708 during Spring-2011

**General comments about the course:** The results revealed that students were satisfied with the course but 14% strongly disagree with students’ contribution. A few were also uncertain about course contents, learning environment and resources, and assessment.

**Strengths:** Provoked interest in pest problem, Contents interesting, practical knowledge on vertebrate pest control.

**Weaknesses:** Extra material to be removed, make it short & comprehensive, need to add more practical work.

**WL-709**

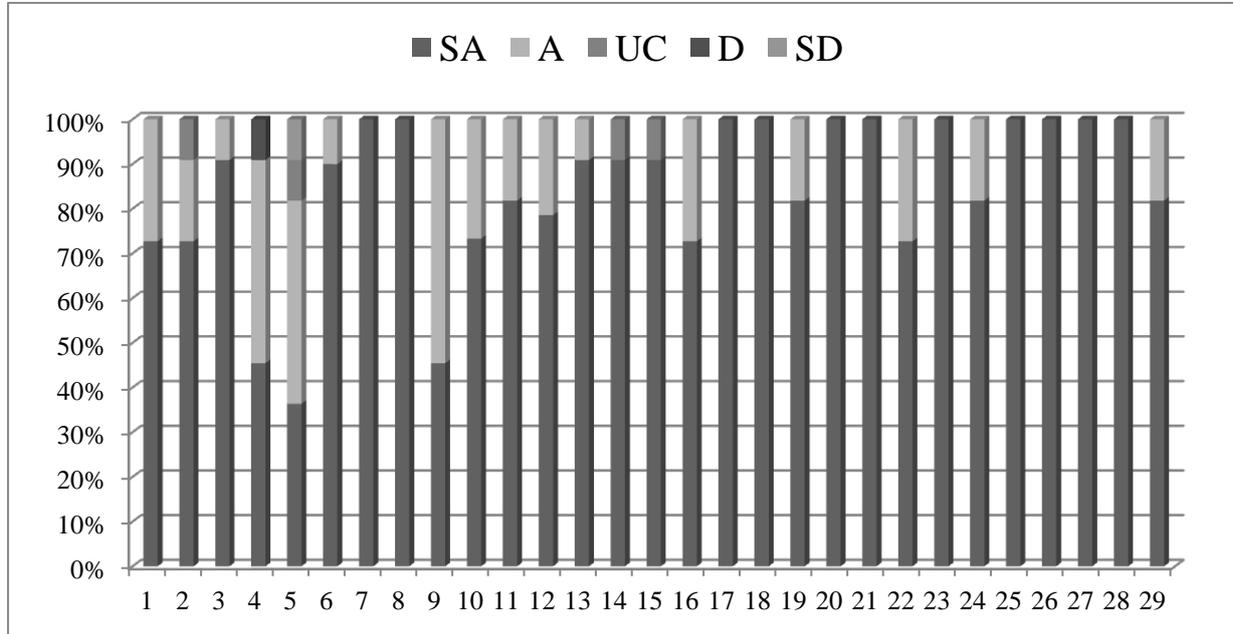


Fig. 19. Course Evaluation of WL-709 during Spring-2011

**General comments about the course:** The results revealed that students were satisfied with the course but 3-6% strongly disagree with students contribution, quality of delivery and assessment.

**Strengths:** Good information about wildlife values & society, material was relevant.

**Weaknesses:** Include case studies.

**WL-711**

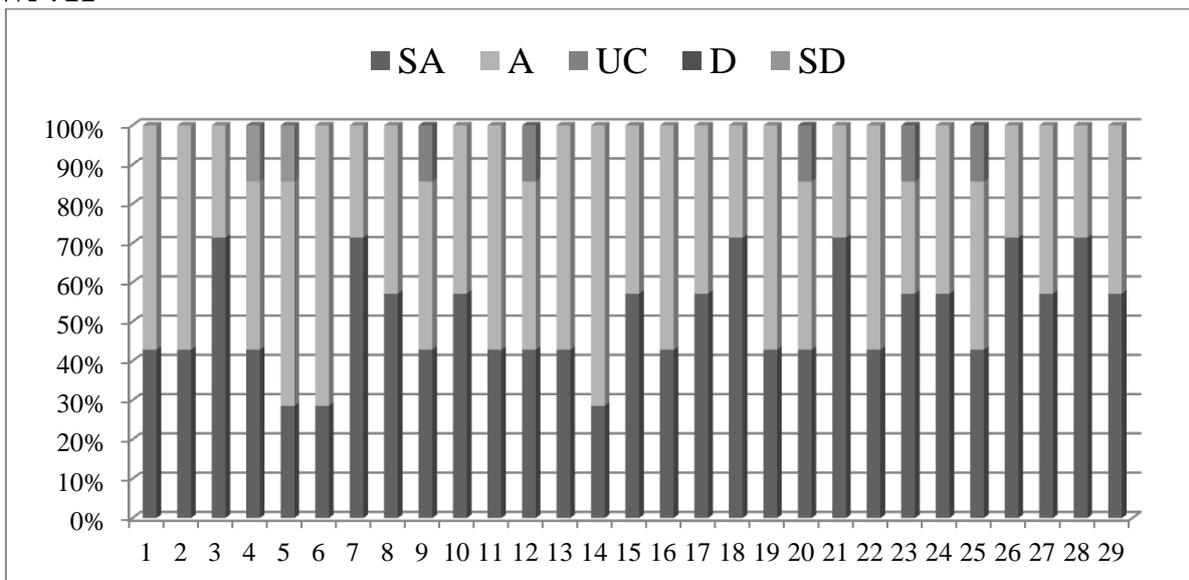


Fig. 20. Course Evaluation of WL-711 during Fall-2011

**General comments about the course:** The results revealed that majority of students were satisfied with the course. However, a few were uncertain about learning resources, quality of delivery and assessment.

**Strengths:** Provided skills on scientific writing, well organized & managed.

**Weaknesses:** Include research practices, more resources for field work.

**WL-712**

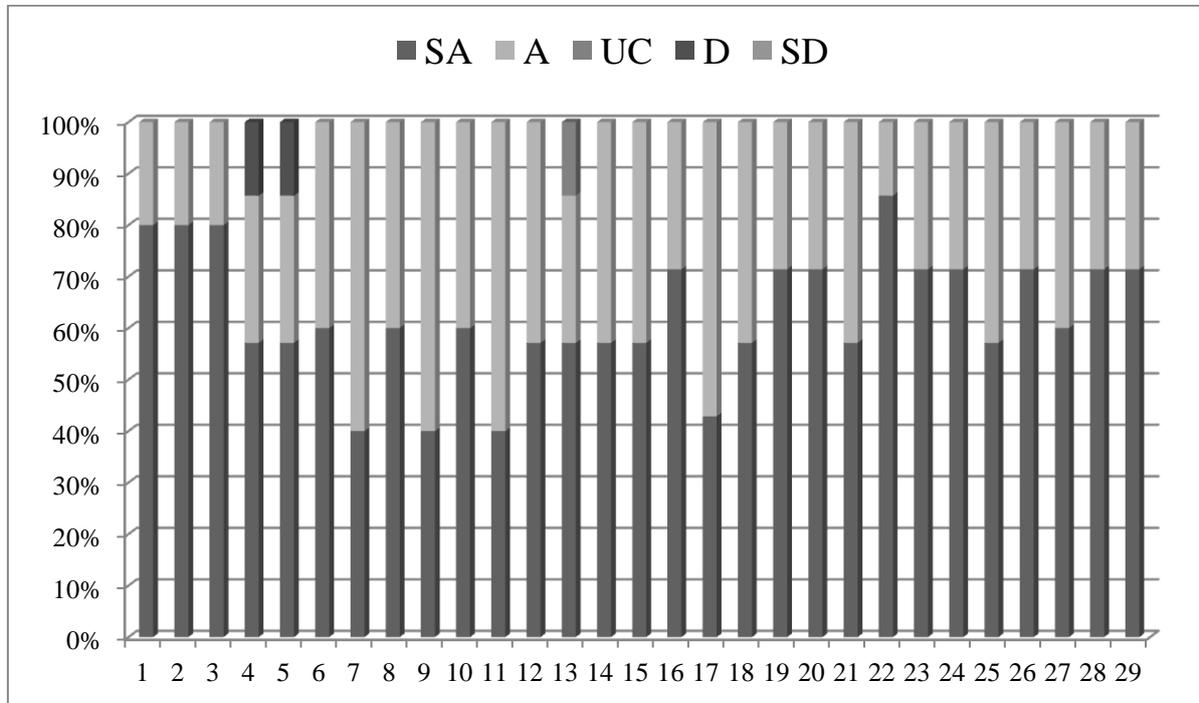


Fig. 21. Course Evaluation of WL-712 during Fall-2010

**General comments about the course:** The results revealed that majority of students were satisfied with the course. However, 11% disagree with student contribution and 14% uncertain about learning resources.

**Strengths:** Conservation strategies & goals of conservation biology.

**Weaknesses:** Use of multimedia for lectures, provision of books on the subject.

**WL-714**

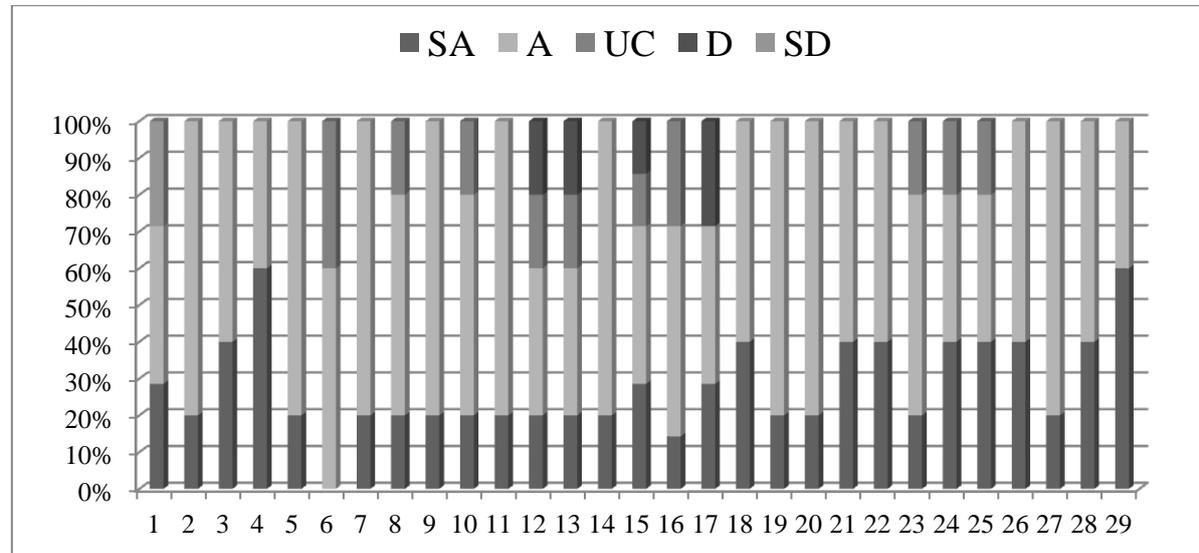


Fig. 22. Course Evaluation of WL-714 during Spring-2011

**General comments about the course:** The results revealed that majority of students were satisfied with the course. However, 19% disagree & 9% strongly disagree with course contents & organization, 36% uncertain about learning environment and 14% about learning resources.

**Strengths:** Gave sufficient knowledge on the subject.

**Weaknesses:** Include more practical work.

**WL-716**

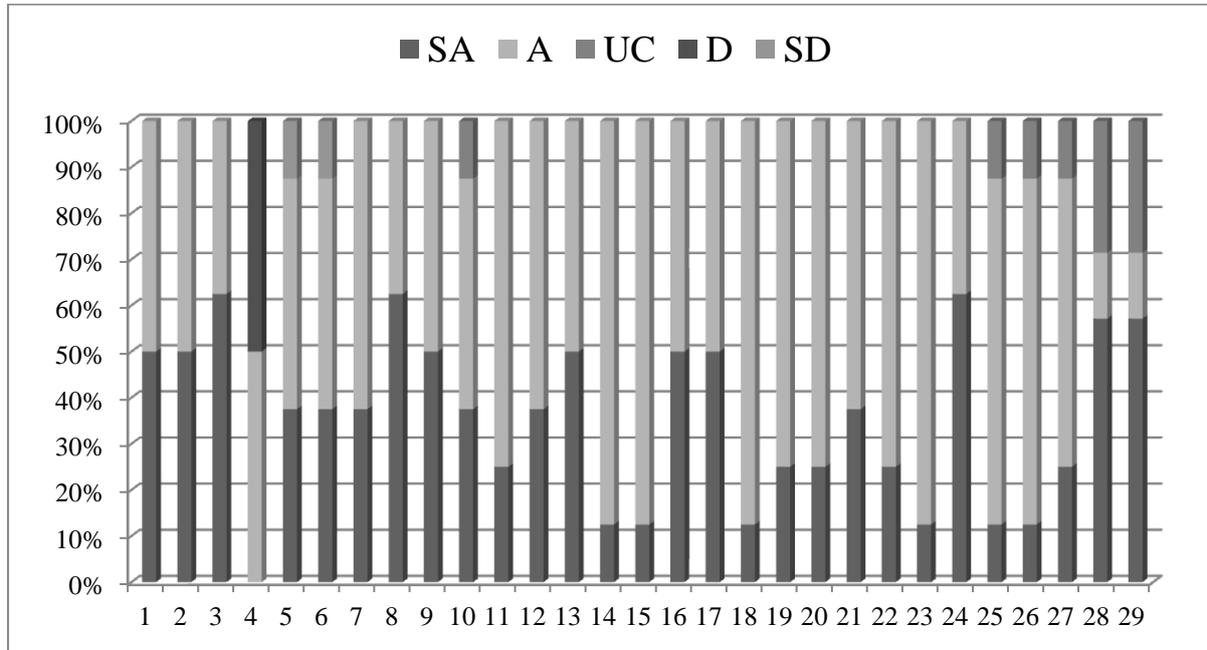


Fig. 23. Course Evaluation of WL-716 during Fall-2010

**General comments about the course:** The results revealed that majority of students were satisfied with the course. However, 10% strongly disagree with student contribution, 6% with learning environment & teaching method.

**Strengths:** Informatory, Gave knowledge about fisheries & fish breeding.

**Weaknesses:** Field tours, teaching practical techniques.

## WL-718

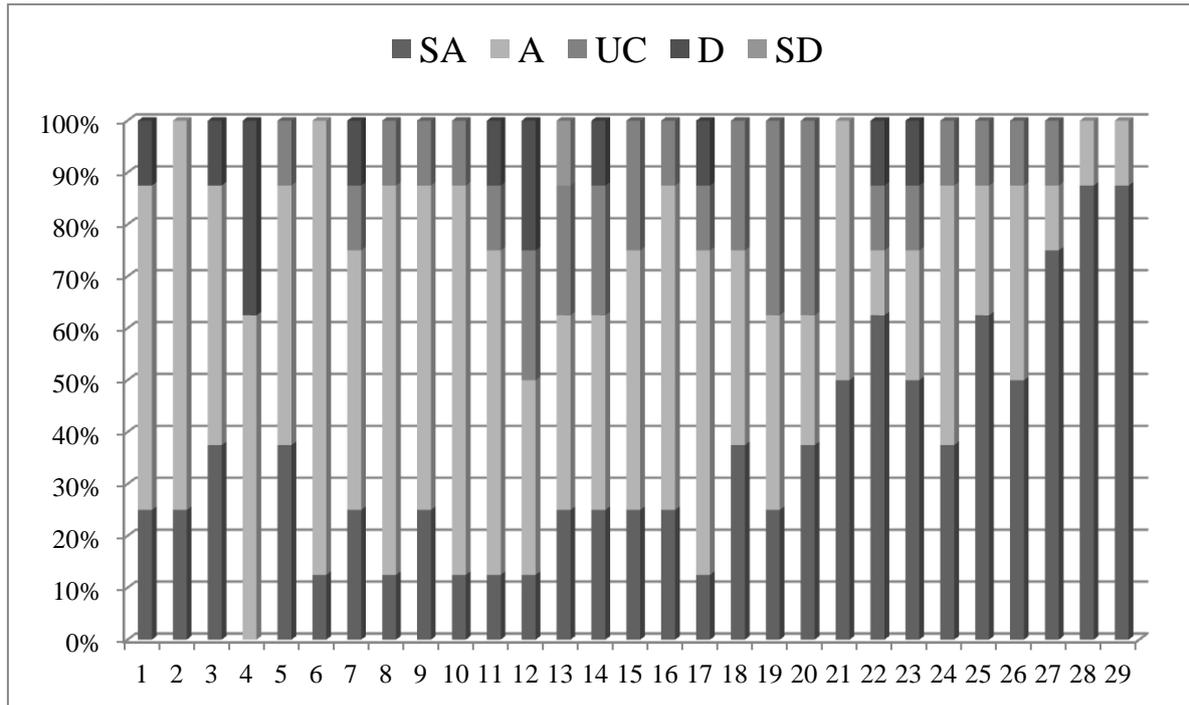


Fig. 24. Course Evaluation of WL-718 during Spring-2011

**General comments about the course:** Majority of students were satisfied with the course. However, 8% disagree with course contents & organization, 4% with learning resources, 6% with assessment, 10% with teaching assistant evaluation, 6% were uncertain about student contribution, 12% about learning environment, 17% about learning resources, 33% about quality of delivery.

**Strengths:** Course was manageable, Informatory.

**Weaknesses:** More practical, improving the contents.

## WL-726

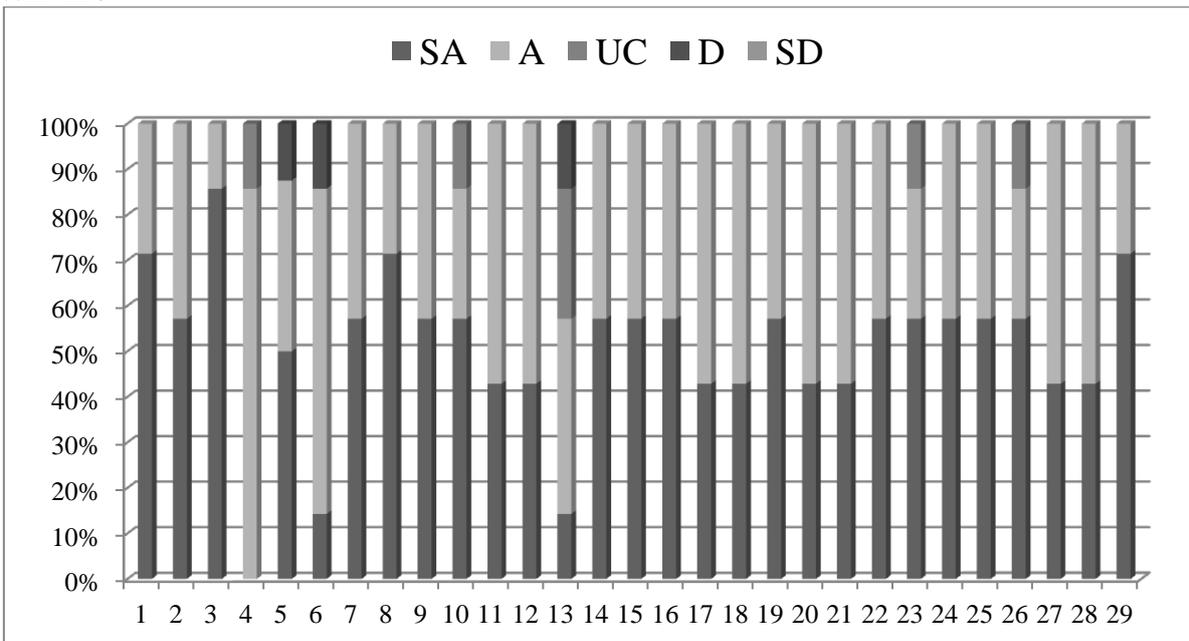


Fig. 25. Course Evaluation of WL-726 during Fall-2011

**General comments about the course:** The results revealed that majority of students were satisfied with the course. However, 10% disagree about student contribution, 7% with learning environment & teaching method, 4% with learning resources, 7% uncertain about learning resources.

**Strengths:** Concept cleared on conservation, Gained knowledge on wildlife management & national policy.

**Weaknesses:** Lectures on multimedia, More practical, improving the contents.

### WL-729

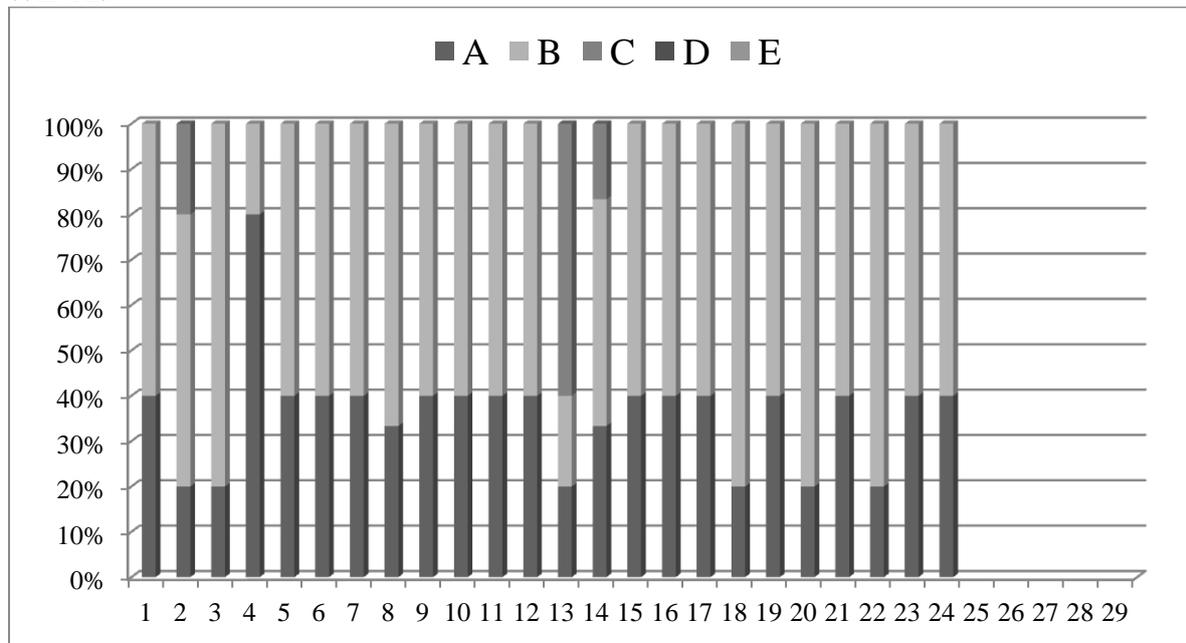


Fig. 26. Course Evaluation of WL-729 during Spring-2011

**General comments about the course:** The results revealed that majority of students were satisfied with the course. However, 20% disagree about student contribution, 7% uncertain about course contents & organization, 20% uncertain with learning resources.

**Strengths:** Work load was manageable, class environment was conducive for learning, presented clearly, assessment method was reasonable.

**Weaknesses:** Learning resources about the course not good in library.

### ALUMNI SURVEY RESULTS

Feedback of students graduated during 2010 and 2011 was acquired through Proforma-7. Majority of the Alumni have rated the knowledge imparted by the department as very good and with respect to communication skills it is mix of excellent & very good. Interpersonal skills have been given grade A by majority of alumni and the management/leadership skills grade A and B. Results of the survey are presented in Fig. 27.

#### General comments:

Improve practical work and provide more material to students. There should be more study tours to enhance knowledge of students. Courses such as confidence building and improve their professional skills may be introduced. Gained lot of knowledge from the university and want to study further.

## Career opportunities:

More Job opportunities need to be created at national level.

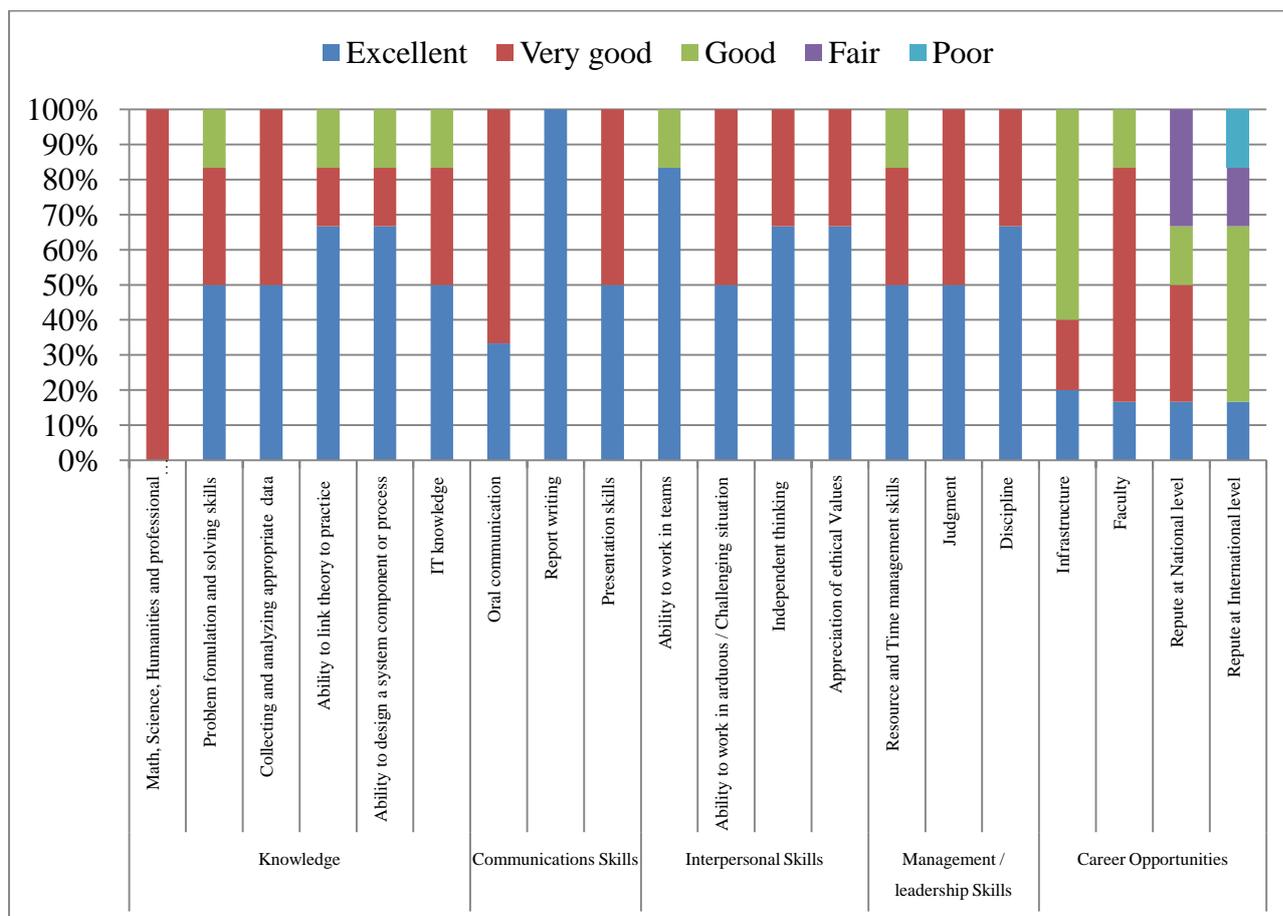


Fig. 27. Alumni Survey Results for M.Sc. students

## SURVEY OF GRADUATING STUDENTS

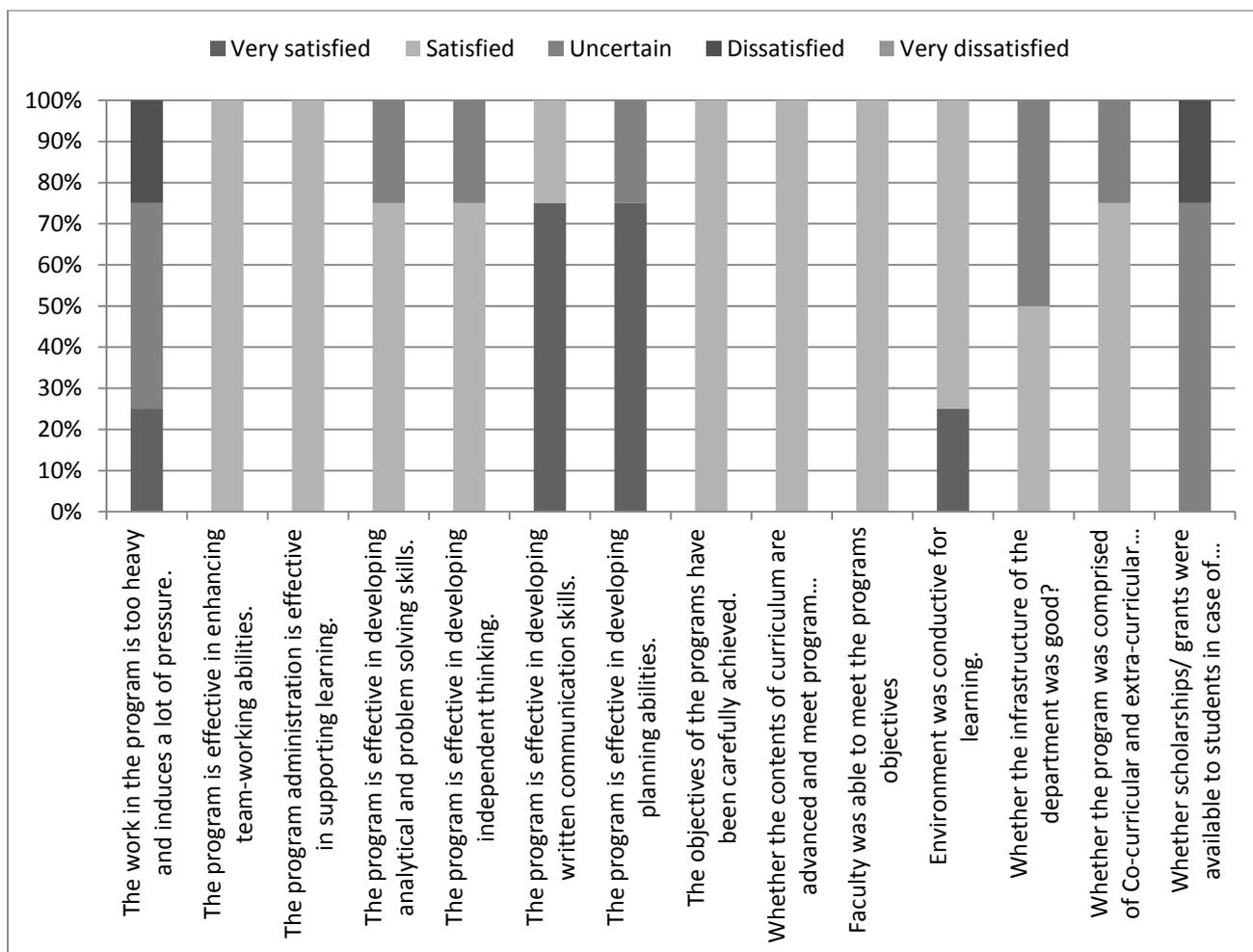
Survey of graduating students was conducted through Performa 3. On the average 40% students showed their high satisfaction regarding all the parameters asked. With respect to enhancing team work skills and written communication skills, 100% students were highly satisfied. The results of the survey are given below in Fig. 28.

### Best aspects of the Program:

- Specifically targeted conservation of wildlife
- Knowledge on conservation aspects of wildlife
- Field visits and wildlife observations to natural areas
- Confidence building, field work, research and writing abilities

### Aspects of Program in need of improvement:

- More study tours and facilities to students for research
- Field studies and technical skills needs improvement
- Introduction to wildlife of Pakistan may be improved
- More practical work may be included



**Figure 28. Graduating students (M.Sc.) survey results**

**Standard 1-3. The results of program’s assessment and the extent to which they are used to improve the program must be documented**

Regular assessment process will be continued and results will be incorporated accordingly. Following are the strengths and weaknesses of program identified.

**Strengths of the Program**

1. The department is having qualified teachers with full acquaintance of their respective subjects, knowledge of research and management techniques for study of wildlife.
2. There is one professor, one associate professor in the department both are foreign qualified, one assistant professor who got Ph.D. degree from Quid-i-Azam University, Islamabad, one lecturer with Ph.D. in Zoology (with specialization in wildlife) from Karachi University and one lecturer has completed her M. Phil. (Wildlife Management) from PMAS-AAU Rawalpindi. Three faculty members are HEC approved supervisors who can supervise Ph.D. students.
3. All faculty members are involved in research directly or indirectly as supervisor and committee member of the post-graduate students.

4. Two faculty members (one assistant professor and one lecturer) have got six months training in wildlife from foreign universities (USA and Malaysia).
5. All faculty members have got research projects funded from various funding sources.
6. Two laboratories have been established with basic necessary equipment in addition to having equipments to carry out field studies on wildlife species.
7. The department has got a development project funded by HEC under which necessary field and laboratory equipment and class room aids have been purchased to strengthen academic and research activities of the department.
8. Department has signed MoUs with five public and private sector organizations to facilitate its research projects and students' theses research.

### **Weaknesses of the Program**

1. There is scarcity of space as there is only one class room due to which difficulty is faced in adjusting simultaneous classes.
2. Two faculty members are housed in cabins within the laboratories due to which working and sitting place (for Ph.D. students) has become insufficient. The laboratories are also filled with equipments purchased under the HEC project. Therefore, at least two faculty office rooms, one store room and one laboratory are needed to meet the needs.
3. Wildlife is an applied, field-based subject which needs extensive touring for imparting firsthand knowledge to the students and therefore, there is need of having a suitable field vehicle.
4. Coordination with federal and provincial wildlife departments and other organizations is currently under development which needs to be further facilitated/ enhanced for field tours and research studies.

### **Standard 1-4. The department must assess its overall performance periodically using quantifiable measures.**

The evaluation process indicated high efficiency of system and satisfactory impact of outcomes (Table 4).

**Table 4. Performance measures for research activities**

<b>Faculty</b>	<b>Publications in Journals</b>	<b>Research &amp; Development Projects</b>
Dr. Iftikhar Hussain	13	1
Dr. Maqsood Anwar	10	1
Dr. Tariq Mahmood	12	2
Mr. Muhammad Rais	11	2
Ms. Bushra Allah Rakha	11	1

### **Future Plans**

The Department of Wildlife Management has planned a number of research studies in future addressing the issues of wildlife conservation and protected areas management including wetlands and collecting data on biology/ecology of wildlife species particularly the threatened species. Some of the studies/activities include:

1. Population density/size, habitat utilization/preference, breeding habits/biology of wildlife species, especially rare and threatened species
2. Food habits, diet composition and food preference of wildlife species, particularly focusing on ungulates, carnivore and threatened bird species.

3. Distribution range/pattern of wildlife species especially focusing on Pothwar area.
4. Baseline data on protected areas including wildlife diversity, threatened or rare species studies, social issues and major threats to the PAs.
5. Baseline data on wetlands including both resident and migratory waterfowl and threats to the ecosystem.
6. Wildlife damage assessment / management particularly of rodent pests, porcupine and wild boar.
7. To impart quality education in wildlife management/conservation through study tours, audio visual aids along with provision of latest literature, journals, books and internet.
8. To impart training to employees of wildlife/forest departments, other relevant organizations and NGOs in wildlife research and management.
9. To develop strong collaboration and linkages with wildlife related government departments and NGOs for wildlife conservation and research.
10. To equip the department with the advanced equipments both for laboratories and field surveys/studies of wildlife species.
11. To enhance knowledge and skills of faculty members about latest advancements in wildlife/biodiversity research and conservation through exchange programs, short trainings and collaborative research projects within and outside Pakistan.

#### **Faculty satisfaction regarding the administrative services**

- The department maintains a ratio of 4:1 for the academic (including technical) and administrative/support (non-technical) staff which fulfils the standard set by HEC
- Administrative meetings (departmental, university, academic council, and syndicate) are attended as and when required.
- Office matters/files are disposed regularly and so far no complaint has been received from higher administrative authorities.
- Proper records/file of each employee and students are maintained.

Quantitative assessment of the department for the last two years is given in the Table 5.

**Table 5. Quantitative assessment of the department (Fall 2010 to Spring 2012)**

<b>Sr. #</b>	<b>Particular</b>	<b>No.</b>	<b>Remarks</b>
1	M. Sc. degree awarded	14	
2	M. Phil. degree awarded	19	
3	Ph.D. degree awarded	Nil	
4	Post-Doc fellowship	Nil	-
5	Students: Faculty ratio		Fulfils HEC criteria
6	Technical: Non-technical ratio		Fulfils HEC criteria

#### **EMPLOYER SURVEY**

As there was no graduating student working in the departments by the end of spring semester 2010, the employer survey under Performa 8 was not conducted.

## **CRITERIA 2: CURRICULUM DESIGN AND ORGANIZATION**

### **A. Intent**

All courses for M.Sc. were initially developed by faculty members and finalized after sharing with relevant government departments, NGOs, universities and individual experts. During the course of time, a few courses have been revised and some new courses added based on the need felt by the department. Curriculum and course contents are finally approved by the University Academic Council.

### **B. Definition of credit hour**

One credit hour is one theory lecture or two hours laboratory practical per week. A credit hour carries 20 marks.

### **C. Degree plan - pre-requisites**

B.Sc. with a minimum of 45% marks or its equivalent from a recognized institution in related subjects Biological sciences with Zoology as one of the major subject/Forestry & Range Management or an equivalent qualification in relevant discipline from a HEC recognized institution.

The selection criterion for each course is as follows;

- The course is relevant to the degree program
- It meets the national and international requirements for the degree
- Adequate facilities are available in the department to offer the courses
- The course contents meet the program objectives as highlighted and provided by the Higher Education Commission of Pakistan.

Each course in the program is to be completed for credits specifying the following:

- Course title (WL)
- Course objectives and outcome (Given in course breakdown into lectures separately)
- Catalogue description (yes)
- Text book and reference (Given in course contents)
- Syllabus breakdown in lectures (yes supplied to QEC separately)
- **Computer usage:** Internet facility is used by faculty members to update their knowledge regarding each course, research studies and recent references. Students also use this facility to solve their problems, assignments and presentations.
- **Laboratory facilities** are provided to the students for their practical exercise, given in the curricula. Post-graduate students also use laboratories for their theses research where equipment, material and chemicals are provided.

### **D. Degree requirements**

The duration of M.Sc. degree shall not be less than four semesters for whole time students and not less than six semesters for part time/partial residents and not more than six and eight semesters, respectively. Each student has to complete a minimum of 60 credits for the award of degree. Student may opt for thesis carrying 10 credits (not counted towards calculation of CGPA). List of major courses for M.Sc. is given in Table 6.

**Table 6. Course Requirements for M.Sc. in Wildlife Management**

S. No.	Course No	Course Title	Credit Hours
1	WL-701	An Introduction to Wildlife of Pakistan	3 (2-2)
2	WL-702	Wildlife Population Ecology	3 (3-0)
3	WL-706	Wildlife Management at Wetlands	3 (3-0)
4	WL-707	Terrestrial Wildlife Management	3 (3-0)
5	WL-708	Wildlife Damage Management	3 (2-2)
6	WL-709	Society, Values & Economics of Wildlife	3 (3-0)
7	WL-711	Research Planning and Report Writing	3 (1-4)
8	WL-712	Conservation Biology of Wildlife	3 (3-0)
9	WL-714	Reproductive Biology and Breeding	3 (2-2)
10	WL-716	Wild Fish fauna of Pakistan	3 (3-0)
11	WL-718	Captive Wildlife Management	3 (3-0)
12	WL-719	Special Problem	1 (1-0)
13	WL-720	Seminar	1 (1-0)
14	WL-726	Essentials of Wildlife Conservation- National Perspectives	3 (3-0)
15	WL-729	Biology and Conservation of Amphibians and Reptiles	3 (2-2)

**Standard 2.1. The curriculum must be consistent and support the program's documented objectives.**

The curriculum of Department is consistent with the program objectives (Table 7).

**Table 7. Courses with relation to their outcomes**

Course	Objectives		
	HRD	Priority of Research	Integrated approaches
Wildlife management/ conservation	++ +	++	+ +++
Wildlife study/ management techniques	+ + +	++ + +	+ + + +
Wildlife ecology	+ +	+ + +	+ + +
Wildlife biology	+ +	++	+ +
In-situ conservation	++	++	++
Ex-situ conservation	+	+	+
Policy/law/social issues	+	+	++

+ = Relevant, ++ = Relevant & satisfactory, +++ = Very relevant & satisfactory, ++++ = highly relevant & highly satisfactory

### **Assessment of the Department of Wildlife Management Curriculum**

The assessment of curriculum given in Table 12 and the courses are cross tabulated according to the program outcomes.

1. The curriculum fits very well and satisfies the core requirements for the program, as specified by the respective accreditation body.
2. The curriculum satisfied the general arts and professional and other discipline required for the program according to demands and requirements set by the Higher Education Commission.

**Standard 2.2. Theoretical background, problem analysis and solution design must be stressed within the program’s core material**

**Table 8. Courses representing theoretical background, problem analysis and solution design**

Elements	Courses	Title of Courses
Theoretical Background	WL-701	An Introduction to Wildlife of Pakistan
	WL-702	Wildlife Population Ecology
	WL-709	Society, Values & Economics of Wildlife
	WL-714	Reproductive Biology and Breeding
	WL-716	Wild Fish fauna of Pakistan
Problem Analysis	WL-711	Research Planning and Report Writing
	WL-719	Special Problem
Solution Designs	WL-706	Wildlife Management at Wetlands
	WL-707	Terrestrial Wildlife Management
	WL-708	Wildlife Damage Management
	WL-712	Conservation Biology of Wildlife
	WL-718	Captive Wildlife Management
	WL-720	Seminar
	WL-726	Essentials of Wildlife Conservation-National Perspectives
	WL-729	Biology and Conservation of Amphibians and Reptiles

**Standard 2-6. Information technology component of the curriculum must be integrated throughout the program**

During curriculum development, all aspects of information technology were considered and after a critical analysis, relevant aspects were integrated into the program. Two courses of statistics (6 credit hours) based on computer practical were included in the curriculum to fulfill the requirements of the students.

**Standard- 2.7. Oral and written communication skills of the student must be developed and applied in the program.**

- Two seminars each of one credit hour are compulsory for post-graduate students.
- Special problem (one credit hour) is offered to the students which require writing a comprehensive report on a topic and presenting it in the class.
- A course of 3 credit hours entitled “Research planning and report writing” has been integrated in the curriculum for M.Sc. students.
- Assignments are given to all students in each course on specific titles relevant to the course which are presented orally and given as written assignments by the students which improve their oral and written communication skills.

### **CRITERIA 3.**

### **LABORATORIES AND COMPUTER FACILITIES**

- Laboratory Title: Wildlife Management Laboratory -1  
Wildlife Management Laboratory-2
- Location and Area: Faculty of Forestry, Range Management and Wildlife, Ground and 1<sup>st</sup> Floor of Spur-D, Main Academic Block.
- Objectives: Laboratories are used by students and faculty for research studies including; autopsy of animals, micro-histological studies and food/diet composition analysis studies.

Research work for the graduate and post-graduate students

- Adequacy for instructions: Laboratories meet the requirements in terms of equipment, chemicals, furniture and general facilities, however, not spacious enough for demonstration purposes and analysis studies.
- Major apparatus: Major equipments available in the Labs. include; microscopes, deep freezers, refrigerators, pH meters, electric balances, electric oven, slides, glass ware, centrifuge machine, spectrophotometer, tissue homogenizers etc. purchased from HEC funded research & development projects.
- Field Equipments: Binoculars, GPS, Cameras, Cages, live traps, spotting scopes, spring balances etc.
- Safety Regulations: Safety measures such as fire extinguishers, first aid kit are not available in the Labs. However, the University maintains a Medical Dispensary for minor incidents.

#### **Standard 3.1. Laboratory manuals/documentation/instructions for experiments must be available and readily accessible to faculty and students.**

Laboratory manuals of each subject are not available in the departmental library. However, books and manuals owned by individual faculty are used by the students. A number of books and manuals have been prepared in the department.

#### **Standard 3.2. There must be adequate support personnel for instruction and maintenance of laboratory**

Laboratories are maintained by two laboratory attendants and one laboratory assistant who assist the students in research studies, practical, cleaning and washing, etc. Students are instructed for Lab. work by respective faculty members.

#### **Standard 3.3. The university computing infrastructure and facilities must be adequate to support program's objectives**

The University has limited computer facility for students. Computer facility is available at the department level to most of faculty members independently. However, it is not adequate to meet the objectives of the programme and needs improvement

#### **CRITERIA 4. STUDENT SUPPORT AND GUIDANCE**

Directorate of Students Affairs of the University organizes support programs, cultural activities for students and guides them in case of any problem. The university staff provides information regarding admission, scholarships, career opportunities, etc. The university arranges orientation programme for new students and guided tours to various departments. However, currently Parent/Teacher association in the university does not exist.

##### **Standard 4.1. Courses must be offered with sufficient frequency and number for students to complete the program in a timely manner.**

- Courses are taught as per strategy and guidance provided by HEC.
- Subject courses are offered as per scheme of study of the department after approval of Academic Council of the university. Courses are offered by faculty trained in the relevant subject and as per their availability.
- Elective courses and minor courses are offered as per policy of HEC and University.

##### **Standard 4.2. Courses in the major must be structured to ensure effective interaction between students, faculty and teaching assistants.**

- Courses are structured and decided among the faculty members in the departmental board of study meeting.
- Courses to be offered are decided before the commencement of semester and the faculty members interact frequently among themselves and with students.
- Students are encouraged to ask question, give comments and take part in the discussions in the class.
- Emphasis is given on effective interaction between the students and between students and teachers.

##### **Standard 4.3. Guidance on how to complete the program must be available to all students and access to qualified advising must be available to make course decisions and career choice.**

- Students are informed about program requirements through office of chairperson of the department and through personal communication of teachers with them.
- The counseling of students is continuous process and students are free to contact relevant teachers whenever they face any professional problem.
- Students are also facilitated for interaction with faculties/scientists in other universities and research organizations whenever they need and there is open option for the students to get membership of professional societies.

#### **CRITERIA 5. PROCESS CONTROL**

##### **Standard 5.1. The process by which students are admitted to the program must be based on quantities criteria and clearly documented. This process must be periodically evaluated to ensure that it is meeting its objectives.**

- The process of admission is well established and followed as per rules and criterion set by University for post graduate students of M.Sc., M. Phil. and Ph.D.
- Admission criteria for M. Sc. program: Sixteen years of education in relevant field/subjects.
- Admission criteria for M Phil. program: M.Sc. in relevant field/subjects with GAT score of 50.

- Admission criteria for Ph.D. program: Eighteen years of education in relevant field/subjects and GAT subject test in wildlife.
- All these entries are based on the recommendations of admission committees.
- Admission criteria is revised when required before the announcement of admissions.

**Standard 5.2. The process by which students are registered in the program and monitoring of students progress to ensure timely completion of the program must be documented. This process must be periodically evaluated to ensure that it is meeting its objectives.**

- Registration of students is done once every year at the time of admission. When a student is admitted for each degree, he/she is evaluated through the result of each course for each semester. If the students fulfill the criteria of the University (a specific CGPA after each semester) they are promoted to the next semester.
- Students are evaluated through Mid, Final and Practical exams and through written assignments and oral presentations.
- In general, the students are registered on competition bases keeping in view the academic and research standards.

**Standard 5.3. The process of recruiting and retaining highly qualified faculty members must be in place and clearly documented. Also processes and procedures for faculty evaluation, promotion must be consistent with institution mission statement. These processes must be periodically evaluated to ensure that it is meeting with its objectives.**

- The University follows the recruitment policy and rules recommended by HEC.
- Posts are advertised in national newspapers and university website, and applicants are short-listed on the basis of experience, qualification, publications and other qualities / activities as fixed by the University
- The candidates are interviewed by the University Selection Board and principal and alternate candidates are selected.
- Selection of candidates is approved by the Syndicate for issuing orders to join within a specified period.
- Induction of new candidates depends upon the number of approved vacancies.
- Recently, Tenure Track System (TTS) has been introduced by the University which is a good incentive for retaining highly qualified faculty members.
- HEC also supports appointment of highly qualified members as foreign faculty professor, national professors and deputes them in various departments.

**Standard 5.4. The process and procedures used to ensure that teaching and delivery of course material to the students emphasizes active learning and that course learning outcomes are met. The process must be periodically evaluated to ensure that it is meeting its objectives.**

- Periodical update of curriculum is done depending upon the requirements, innovations and new knowledge generated.
- New courses are developed and included in the curriculum when need arises.
- Books on various aspects of wildlife are available in the department and in University library where documentation, photocopying and internet facilities are also available. .
- Students also take notes during the classes and photocopies of slides/transparencies are also provided in addition to printed material.

- All efforts are made to impart the course material and knowledge to meet the objectives of the curriculum.

**Standard 5.5. The process that ensures that graduates have completed the requirements of the program must be based on standards, effective and clearly documented procedures. This process must be periodically evaluated to ensure that it is meeting its objectives.**

In the examination system of the University, the following are clearly mentioned;

- The evaluation procedure consists of quizzes, mid and final examinations, practical, assignments, reports and oral presentations.
- The controller of examinations announces the dates of examinations. After each semester, the controller office notifies results of the exams.
- The minimum passing marks for each course is 40% for M.Sc. and M. Phil. and 50 % for Ph.D. in theory and practical, separately.
- In theory, weight age of each component of examination is as under:

Mid Examination	30%
Assignments	10%
Final Examination	60%

- Grade points are as follows

Marks	Grade	Grade point	Remarks
80-100 %	A	4	Excellent
65-79 %	B	3	Good
50-64 %	C	2	Satisfactory
40-49 %	D	1	Pass
Below 40 %	F	0	Fail

- Gold medals are awarded to the students who secure highest cumulative marks in each department. Degrees are awarded to the students in the convocation which is held every year.

## **CRITERIA 6. FACULTY**

**Standard 6-1. There must be enough full time faculty who are committed to the program to provide adequate coverage of the program areas/courses with continuity and stability. The interests and qualifications of all faculty members must be sufficient to teach all courses, plan, modify and update courses and curricula. All faculty members must have a level of competence that would normally be obtained through graduate work in the discipline. The majority of the faculty must hold a Ph.D. in the discipline.**

Currently, there are five full time faculty members out of which four are Ph.D. and one M. Phil. in wildlife management. The fields of specialization of faculty members include; wildlife management/conservation, wildlife study/management techniques, wildlife ecology, wildlife biology, in-situ conservation, ex-situ conservation and policy/law/social issues (Table 9).

**Table 9. Faculty distribution by program area in wildlife management**

S. No.	Area of specialization	Relevant Courses	Number of faculty members	Number of faculty with Ph.D. degree
1	Wildlife management/ conservation	7	4	4
2	Wildlife study/management techniques	4	4	4
3	Wildlife ecology	3	5	3
4	Wildlife biology	7	5	3
5	In-situ conservation	4	3	4
6	Ex-situ conservation	5	2	3
7	Policy/law/social issues	3	2	3

**Standard 6-2. All faculty members must remain current in the discipline and sufficient time must be provided for scholarly activities and professional development. Also, effective programs for faculty development must be in place.**

- In each semester courses are offered according to work load of faculty members
- Division of students for supervision is made on the basis of faculty expertise/research interests

**Existing faculty development programs at department and university level**

- Faculty members attended conferences/workshops/seminars outside and within university.
- Laboratory, library and internet facilities are available for scholarly work and academic improvement
- Support for attending conferences lead to enhancement of research initiatives.
- All faculty members got financial support for research projects from HEC and university-funded program specifically designed for junior faculty members.

**Standard 6-3. All faculty members should be motivated and have job satisfaction to excel in their profession**

The young faculty is mobilized by timely back up and appreciation by the senior faculty members. Avenues for research funding are provided to them through university research programme. There are programs and processes in place to attract good faculty members e.g. teaching and research awards annually, reasonable teaching load and class size, social activities and better salary package.

**Results of the faculty survey**

Results of faculty survey (Performa 5) are summarized in Fig. 29. The results generally showed satisfaction of the teachers over most of parameters. However, level of monitoring, cooperation with colleagues and the cooperation of teachers needs to be improved.

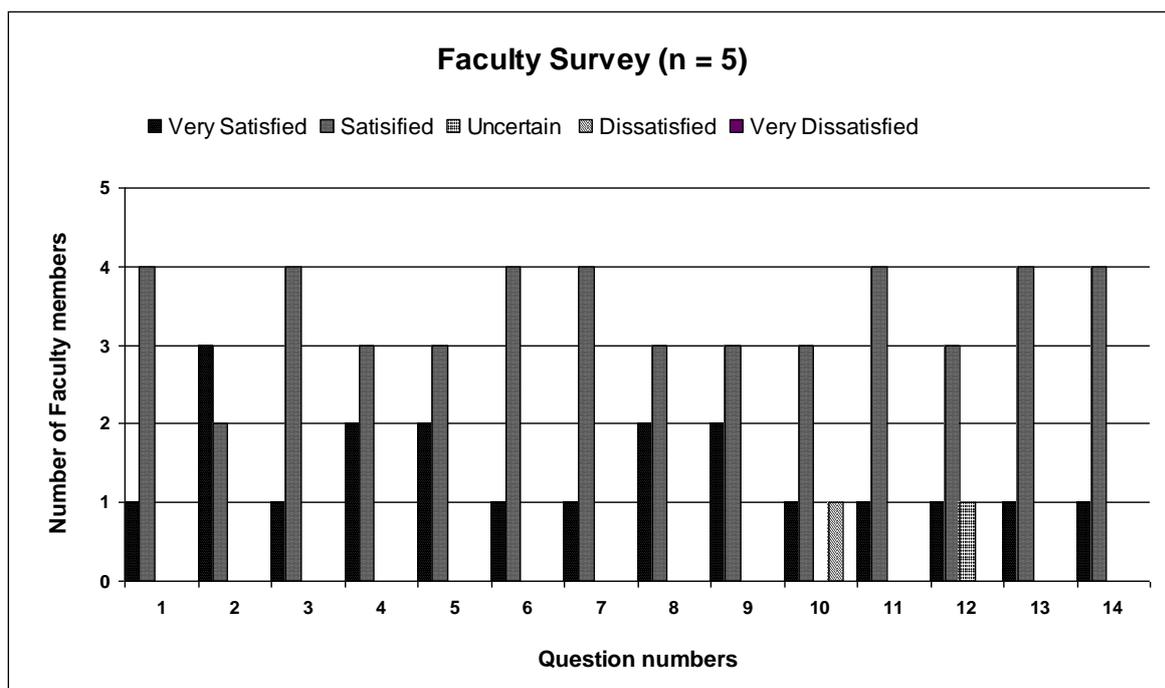


Fig. 29. Results of faculty survey

**Best Program Features:**

- Supervision of students for research
- Cooperation from colleagues
- Conducive environment at the department
- Teaching and research together
- Clear job description
- Funds for research projects

**Programs that could improve your motivation:**

- More computer and internet facilities for students
- Opportunities for improving teaching skills and knowledge

**CRITERIA 7. INSTITUTIONAL FACILITIES**

**Standard 7.1. The institution must have the infrastructure to support new trends in learning such as e-learning. Supportive Infrastructure and Facilities in learning:**

- Two well-equipped labs. and one class room with teaching aids (multimedia, over head projector) and number of books are available in the department.
- However, more sitting place for faculty members and Ph.D. students with computer and internet facility is desired to make working/research/study environment conducive for higher learning.

**Standard- 7.2. The library must possess an up-to-date technical collection relevant to the program and must be adequately staffed with professional personnel.**

- Central library has been recently up-graded with provision of computer and internet facility to the post-graduate students.
- The department is regularly suggesting to the central library for provision of new books related to wildlife sciences.
- The department under its HEC funded project, "Strengthening of the Department of Wildlife Management" is purchasing more than 200 books in the area of wildlife studies.
- Only a small number of scientific journals are available in the central library; even Pakistani Journals are not available. Provision of major journals related to wildlife is highly desired for research and scientific/technical writing.

**Standard- 7.3. Class-rooms must be adequately equipped and offices must be adequate to enable faculty to carry out their responsibilities.**

There is only one classroom with the department which possesses proper teaching facilities such as multimedia projector and overhead projector. Classroom is inadequate for all classes. Sometimes classes are taken in the laboratories. Similarly, space for faculty offices is not appropriate and two faculty members are housed in the cabins built inside the Labs. This makes Lab. space insufficient for practical and research use by the students.

**CRITERIA 8. INSTITUTIONAL SUPPORT**

The university administration is making all possible efforts for strengthening the existing departments by attracting highly qualified faculty and by getting financial support through R&D Project. One such project of Rs. 36.141 million was awarded by HEC for Strengthening of the Department of Wildlife Management.

**Standard 8-1. There must be sufficient support and financial resources to attract and retain high quality faculty and provide the means for them to maintain competence as teachers and scholars.**

There is no proper maintenance/documentation and attractive investment of GPF deducted from salary of the employees. Similarly, no benefit/welfare from BF deduction is available to the faculty except a meager benefit for faculty children's education at university level. Similarly, little attention is being paid for faculty residential facilities at university campus and majority of faculty members remain on waiting list for a long period. Transport facility is not frequently and easily available for field works/touring. Financial support is too low to meet expenses of the department and only Rs. 43,000/- were allocated for the year 2010-11 and 2011-12 for office and Lab. expenses including student research. However, the department can get chemicals, glassware, stationery and other office use items from central stores of university by submitting special request.

**Technical Staff:** Civil Works and internet networking departments are very slow in response. Financial and accounting departments are also slow in their delivery.

**Office equipment:** Sufficient office equipment is available to meet the current teaching and research activities of the department.

**Standard 8-2. There must be an adequate number of high quality graduate students, research assistants and Ph.D. students.**

The admission of M.Sc. and M.Phil. students is held once a year and Ph.D. twice a year i.e. in each semester. A strict merit policy is applied for admission and GRE is required for Ph.D. and GAT for M.Phil. Details of students enrolled during last two years are given in Table 10 and student-faculty in Table 11..

**Table 10. Enrollment in different degree programs during 2010 and 2011**

Year	Number of graduate students			Research assistants	Total
	M.Sc	M.Phil.	Ph.D.		
2010	7	6	0	1	14
2011	12	13	5	1	31
<b>Total</b>	19	19	5	02	45

**Table 11. Graduate students and Faculty Ratio in 2010-2011**

Year	No. of Faculty	No. of Students	Ratio
2010	5	13	1:2.6
2011	5	30	1:6

**Standard- 8.3. Financial resources must be provided to acquire and maintain Library holdings, laboratories and computing facilities.**

An amount of about Rs. 43,000/- per annum is considered sufficient to meet the needs of the department which is too low to maintain and run the departmental business.

## SUMMARY AND CONCLUSIONS

The Department of Wildlife Management at PMAS-Arid Agriculture University, Rawalpindi was established in 2007 with a mandate to carry out teaching and research in wildlife for its conservation in the country, particularly in Pothwar region. There are five faculty members out of them four having doctoral degrees and three are HEC approved supervisors. The courses have been prepared keeping in view the latest developments in wildlife management and conservation. The department is offering M.Sc., M. Phil. and Ph.D. in wildlife management. During the report period 19 students were enrolled in in M.Sc. programme. The department has published more than 40 research papers during the period under report.

Basic equipment for field surveys of wildlife and its habitats has been procured through various funding sources which include binoculars, spotting scopes, global positioning system (GPS), camera, telemetry equipment, camping gear, etc. Two laboratories have been established with basic necessary equipment for micro-histological, taxonomy, food habit studies and food/diet composition. More than 200 latest books on the subject of wildlife/biodiversity have also been purchased and placed in the main library and in the department for ready reference to the students.

Young faculty members have got six research projects from the university funding programme while senior faculty has earned three research projects from HEC. The departmental reaching and research capacity has been enhance through PSDP/HEC funded project titled “Strengthening of Department of Wildlife Management” amounting to Rs.

36.141 m. Research studies currently being conducted focus on wildlife population density and size, wildlife habitat analysis, food habits and diet composition, breeding habits and breeding biology, distribution patterns, data on protected areas and threatened species, wetland ecology, population trends of water birds, threats to wildlife species, wildlife damage assessment and management, etc.

All possible efforts are made to guide the students for programme requirements, through class and personal communication, meetings, study tours, students-teacher interaction, etc. They are well informed of relevant scientific societies, job opportunities and other such activities. University and HEC rules and guidelines are followed for process control covering admission, registration, recruiting policy, courses and delivery of material, academic requirements, performance and grading.

Curriculum design, development and organization is based upon approved criteria. Prerequisites are fully observed, examinations are conducted as per schedule, academic schemes are prepared and courses for each semester are developed. Their efficacy was found to range between satisfactory to highly satisfactory. Self assessment report has shown programme outcomes as satisfactory. Teachers' evaluation and course evaluation by the students' revealed highly satisfactory standards. Faculty survey results were variable but with overall satisfactory rating. Graduating students also showed their satisfaction over the knowledge being provided and research studies conducted about wildlife management in the department.

Performance of the department could be improved considering the following points.

1. There is need for refresher courses for teachers pertaining to teaching methodology, education psychology, research and developments and evaluation of students.
2. Professional and behavioral training of support staff will improve their abilities for enhancing the quality of research and teaching.
3. Advance laboratory equipments are needed to carry out molecular/DNA analysis in food habits and species verification.
4. Department budget may be increased to fulfill its requirements for purchase of chemicals, glassware and other items required for conducting of research.
5. The department is in dire need of office rooms for two faculty members, one store room, one library room, one class room and one laboratory room.
6. Regular provision of transport facility for field visits is highly desired.

## **Thanks**

### **Program Team Members**

1. **Prof. Dr. Iftikhar Hussain** (Coordinator)
2. **Dr. Maqsood Anwar** (Member)
3. **Dr. Tariq Mahmood** (Member)

**Proforma - 1 Student Course Evaluation Questionnaire**

1. The course objectives were clear
2. The Course workload was manageable
3. The Course was well organized (e.g. timely access to materials, notification of changes, etc.)
4. Approximate level of your own attendance during the whole Course
5. I participated actively in the Course
6. I think I have made progress in this Course
7. I think the Course was well structured to achieve the learning outcomes (there was a good balance of lectures, tutorials, practical etc.)
8. The learning and teaching methods encouraged participation.
9. The overall environment in the class was conducive to learning.
10. Classrooms were satisfactory
11. Learning materials (Lesson Plans, Course Notes etc.) were relevant and useful.
12. Recommended reading Books etc. were relevant and appropriate
13. The provision of learning resources in the library was adequate and appropriate
14. The provision of learning resources on the Web was adequate and appropriate ( if relevant)
15. The Course stimulated my interest and thought on the subject area
16. The pace of the Course was appropriate
17. Ideas and concepts were presented clearly
18. The method of assessment were reasonable
19. Feedback on assessment was timely
20. Feedback on assessment was helpful
21. I understood the lectures
22. The material was well organized and presented
23. The instructor was responsive to student needs and problems
24. Had the instructor been regular throughout the course?
25. The material in the tutorials was useful
26. I was happy with the amount of work needed for tutorials
27. The tutor dealt effectively with my problems
28. The material in the practicals was useful
29. The demonstrators dealt effectively with my problems

**Proforma-10      Teacher Evaluation Form**

1. The Instructor is prepared for each class
2. The Instructor demonstrates knowledge of the subject
3. The Instructor has completed the whole course
4. The Instructor provides additional material apart from the textbook
5. The Instructor gives citations regarding current situations with reference to Pakistani context.
6. The Instructor communicates the subject matter effectively
7. The Instructor shows respect towards students and encourages class participation
8. The Instructor maintains an environment that is conducive to learning
9. The Instructor arrives on time
10. The Instructor leaves on time
11. The Instructor is fair in examination
12. The Instructor returns the graded scripts etc. in a reasonable amount of time
13. The Instructor was available during the specified office hours and for after class consultations
14. The Subject matter presented in the course has increased your knowledge of the subject
15. The syllabus clearly states course objectives requirements, procedures and grading criteria
16. The course integrates theoretical course concepts with real-world applications
17. The assignments and exams covered the materials presented in the course
18. The course material is modern and updated

## 1. CURRICULUM VITAE

## 1. Personal Data

Name: DR. IFTIKHAR HUSSAIN  
 Present Position & Address: Professor & Chairman; Department of Wildlife Management, Faculty of Forestry, Rangeland and Wildlife, PMAS-Arid Agriculture University, Rawalpindi-46300  
 Telephone: 051-9291021  
 E-mail: [ifthussain@edu.com.pk](mailto:ifthussain@edu.com.pk)

## 2. Academic Qualification

Degree	Year	Institution/University	Subjects
Ph.D.	1998	University of Reading, UK.	Rodent Management
M. Phil.	1990	Quaid-i-Azam University, Islamabad.	Endocrinology
M.Sc.	1979	University of Punjab, Lahore	Zoology
Post-Graduate Diploma	1986	Karachi University, Karachi	Statistics

3. Area of Specialization: Wildlife Biology and Management
4. HEC approved Ph.D. Supervisor
5. Professional Experience (Research and Teaching): 31 Years
6. Trainings Received (Research & Management): 12
7. Fellowship/Membership of Professional Associations/Societies: 5
8. Research Projects Planning and Implementation: 8
9. Participation in: 10 Conferences; 9 Training Courses and 48 Workshops
10. Supervision of Post-Graduate Theses: a) Ph.D.: 01 (Co-supervised) & 05 (in progress); b) M. Phil.: 13; c) M.Sc.: 07.

## 11. PUBLICATIONS

- a. Papers Published in Peer Reviewed Journals/Proceedings: 47
- b. Books & Manuals: 2
- c. Chapters In Books & Manuals: 15
- d. Abstracts (Papers Presented in Conferences): 42
- e. Research/Technical Reports (Unpublished): 13
- f. Popular Articles/Booklets: 7
- g. Audio-Visuals (Training Materials): 4

## 12) Publications during the report period (2011-2012)

- i. Hussain, I., A. A. Chaudhry and U. Khalid (2011). Wildlife Management. In: Wildlife of Western Himalayan Region of Pakistan (Northern Mountains). (Eds. G. Akbar and M. Anwar). pp. 209-233. WWF-Pakistan. ISBN:978-969-8283-67-4.
- ii. Mahmood, T., I. Hussain and M.S. Nadeem. 2011. Population estimates, habitat preference and the diet of small Indian mongoose (*Herpestes javanicus*) in Potohar Plateau, Pakistan. *Pakistan Journal of Zoology*, 43(1):103-111. (IF: 0.338).
- iii. Rais, M., M. Anwar, T. Mahmood, and I. Hussain. 2011. Bird diversity and conservation at Kalla Kahar lake with special reference to water birds. *Pakistan Journal of Zoology*, 43(4):673-681. (IF: 0.338).
- iv. M. Naeem, M., I. Ahmed, I. Hussain and M. S. Ahmedani. 2011. Performance of taste enhancers mixed with cereal bases and evaluation of the most preferred bait

- composition for *Bandicota bengalensis* (Gray). *African Journal of Biotechnology*, 10(9):3938-3944 (IF: 0.573).
- v. Tabassum, T., M. Rais, M. Anwar, T. Mehmood, **I. Hussain** and S. A. Khan. 2011. Abundance and breeding of the common skittering frog (*Euphlyctis cyanophlyctis*) and bull frog (*Hoplobatrachus tigerinus*) at Rawal lake, Islamabad, Pakistan. *Asian Herpetological Research*, 2(4):245–250. DOI: 10.3724/SP.J.1245.2011.00245.
  - vi. Bilal, S., M. Rais, M. Anwar, T. Mahmood, **I. Hussain**, M. S. Nadeem. 2011. Trend in the diversity of migratory ducks at Rawal Lake, Islamabad. *Berkut* (Ukrainian Journal of Ornithology), 20(1-2):65-69
  - vii. **Hussain, I.**, A. Nisa and S. Khalil. 2012. Population Biology of Grey Francolin (*Francolinus pondicerianus*) in Agro-Ecosystem of Pothwar Plateau, Pakistan. *Chinese Birds*, 3(2):91-102 China, DOI 10.5122/cbirds.2012.0009.
  - viii. Rais, M., S. Baloch, J. Rehman, M. Anwar, **I. Hussain** and T. Mehmood. 2012. Diversity and conservation of amphibians and reptiles in north Punjab, Pakistan. *The Herpetological Bulletin* (UK), 122:16-25.
  - ix. Mushtaq, M., **I. Hussain** and A. Mian. 2012. Effectiveness of groundnut-maize bait as carrier of coumatetralyl against Indian crested porcupine, *Hystrix indica* Kerr. *Pakistan Journal of Zoology*, 44(2):579-581. (IF: 0.338).
  - x. Mahmood, T., R. Hussain, M. Rais, **I. Hussain** and M.S. Nadeem. 2012. Habitat analysis and population estimates of three falcon species, Red-headed Merlin (*Falco chicauera*), Common Kestrel (*Falco tinnunculus*) and Saker Falcon (*Falco cherritg*), inhabiting district Chakwal, Pakistan. *Pakistan Journal of Zoology*, 44(3):787-798. (IF: 0.338).
  - xi. Khan, A.A., S. Munir and **I. Hussain**. 2012. Evaluation of in-burrow baiting technique for control of rodents in groundnut crop. *Pakistan Journal of Zoology*, 44(4):1035-103. (IF: 0.338)
  - xii. Mehmood, A., M. S. Ansari, S. Akhter, A. A. Khan, **I. Hussain**, Shams-ul-Hassan, T. Z. Qureshi and B. A. Rakha. 2012. Occurrence of pathogenic bacteria in small mammals-inhabiting poultry aarms of Rawalpindi/Islamabad, Pakistan. *Pakistan Journal of Zoology*, 44 (4): 1185-1187 (IF: 0.338).
  - xiii. Qureshi, N. A., M. S. Ansari, S. Akhter, A. A. Khan, **I. Hussain** and B. A. Rakha. 2012. Feeding habits of common quail (*Coturnix coturnix*) migrating through Rawalpindi, Pakistan. *Pakistan Journal of Zoology*, 44 (6): 1760-1762. (IF: 0.338).

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## 2. Curriculum Vitae

### Personal Details:

**Nnme:** Dr. Tariq Mahmood

**Present position and Address:** Assistant Professor, Department of Wild life Management, PMAS Arid Agriculture University, Rawalpindi 46300, Pakistan

Contact No. Cell #: 0313-5307794; Office: 051-9291021

E-mail address: [tariqjanjua75@uair.edu.pk](mailto:tariqjanjua75@uair.edu.pk).

### **Academic Qualification:**

Degree	Year	Subject	Institution
Ph.D.	2009	Animal Physiology	QAU Islamabad
M.Phil.	2002	Animal Physiology	QAU Islamabad
M.Sc.	1994	Zoology	PU Lahore

### 1. Research Projects: a. Ongoing Project:

Donor Agency	Project Title	Duration	Amount Rs.
HEC Islamabad	Ecology of Indian pangolin <i>Manis crassicaudata</i> in	2010-13	21,58,422/-

	Potohar Plateau		
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b. Projects completed (PMAS-AAUR-Funded) = 01

3. Professional Experience (Research and teaching) : 17 years
4. Field of Specialization: Wildlife Ecology, Animal Physiology, Toxicology
5. HEC-Approved Supervisor
6. Fellowship/Membership of Professional Associations/Societies: 2
7. Research Projects Planning and Implementation: 4
8. Supervision of Post-graduate students:
  - a. Numbers of M.Phil. Produced: 13
  - b. Students Currently Enrolled: **Ph.D.** = 03 No.; **M. Phil.:** 03 No.
9. Conferences/Seminars/Workshops Attended:
  - a. International: 01 (September 2011, Kuching, Malaysia), National: 12
10. PUBLICATIONS
  - a. Papers Published in Peer Reviewed Journals/Proceedings: 29
  - d. Abstracts (Papers Presented and published in Conferences): 18
  - e. Research/Technical Reports (Unpublished): 04
  - f. Popular Articles/Booklets: 01

**11) List of Publications during the report period (2011-2012): 12 Nos.**

- i. **Mahmood, T.**, I. Hussain and M.S. Nadeem. 2011. Population estimates habitat preference and the diet of small Indian mongoose (*Herpestes javanicus*) in Potohar Plateau, Pakistan. *Pakistan Journal of Zoology*, 43(1):103-111. (**IF: 0.338**).
- ii. **T. Mahmood**, S. M. A. Shah, M. Rais and M. S. Nadeem. 2011. An Investigation into the Trade of Animal species at pet shops of Rawalpindi and Multan cities. *The JAPS*, 21(4):822-829. (**IF: 0.585**).
- iii. S. Yousaf, **T. Mahmood**, M. Rais and I. Z. Qureshi. 2011. Population Variation and food habits of Ranid frogs in the rice-based cropping system in Gujranwala Region, Pakistan. *Asian Herpetological Research*, 1(2): 123-130. (**IF: 0.294**)
- iv. M. S. Nadeem, **T. Mahmood**, M. Asif and M. M. Hassan. 2011. Annual reproductive success of Hoopoe Lark *Alaemon alaudipes* in Nag valley (1999-2001) Kharan, Pakistan. *Pakistan Journal of Zoology*, 43(2): 279-284. (**IF 0.338**)
- v. Rais, M., M. Anwar, **T. Mahmood**, and I. Hussain. 2011. Bird diversity and conservation at Kalla Kahar Lake with special reference to water birds. *Pakistan Journal of Zoology*, 43(4):673-681. (**IF: 0.338**).
- vi. Tabassum, T., M. Rais, M. Anwar, **T. Mahmood**, I. Hussain and S. A. Khan. 2011. Abundance and breeding of the common skittering frog (*Euphlyctis cyanophlyctis*) and bull frog (*Hoplobatrachus tigerinus*) at Rawal Lake, Islamabad, Pakistan. *Asian Herpetological Research*, 2(4):245-250. DOI: 10.3724/SP.J.1245.2011.00245. (**IF: 0.294**)
- vii. Bilal, S., M. Rais, M. Anwar, **T. Mahmood**, I. Hussain, M. S. Nadeem. 2011. Trend in the diversity of migratory ducks at Rawal Lake, Islamabad. *BERKUT* (Ukrainian Journal of Ornithology), 20(1-2):65-69
- viii. **T. Mahmood**, N. Amin, M. Rais. 2011. Captive breeding of demoiselle crane in Lakki Marwat, Khyber Pakhtunkhwa, Pakistan. *BERKUT* (Ukrainian Journal of Ornithology): 20 (1-2): 153-158.
- ix. M.S. Nadeem, S.M.K. Imran, **T. Mahmood**, A. R. Kyani, and S. I. Shah. 2012. A comparative study of the diets of Barn Owl (*Tyto alba*) and Spotted Owl (*Athene brama*) inhabiting Ahmadpur East, southern Punjab, Pakistan. *Animal Biology*, 62(1): 13-28. (**IF: 0.721**)

- x. **T. Mahmood**, M. K. Siddiq, M. Rais and M. S. Nadeem. 2012. Distribution and abundance of freshwater turtles in Korang River Islamabad-Rawalpindi, Pakistan. *Pakistan Journal of Zoology*, 44 (3): 889-893. (**IF: 0.338**)
- xi. Rais, M., S. Baloch, J. Rehman, M. Anwar, I. Hussain and **T. Mahmood**. 2012. Diversity and conservation of amphibians and reptiles in north Punjab, Pakistan. *The Herpetological Bulletin* (UK), 122:16-25.
- xii. **Mahmood, T.**, R. Hussain, M. Rais, I. Hussain and M.S. Nadeem. 2012. Habitat analysis and population estimates of three falcon species, Red-headed Merlin (*Falco chicauera*), Common Kestrel (*Falco tinnunculus*) and Saker Falcon (*Falco cherritg*), inhabiting district Chakwal, Pakistan. *Pakistan Journal of Zoology*, 44(3):787-798. (**IF: 0.338**).

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### 3. Curriculum Vitae

#### 1. Personal Information

Name and Designation: **Bushra Allah Rakha**, Lecturer (Wildlife Management)  
**Address:** Department of Wildlife Management, Pir Mehr Ali Shah, Arid Agriculture University Rawalpindi-46300, Pakistan  
**Contact No.** Mobile: +92-3336341607  
Office No: +92-51-9291021  
**E-mail:** [arbushra@uaar.edu.pk](mailto:arbushra@uaar.edu.pk), [bushrauaar@gmail.com](mailto:bushrauaar@gmail.com)

#### **EDUCATION:**

<u>Institution</u>	<u>Degree/Certificate</u>	<u>Major Subject</u>	<u>Division</u>
Pir Mehr Ali Shah Arid Agriculture University, RWP	Master of Philosophy	Wildlife Management	1 <sup>st</sup> Division 3.24/4
University of Arid Agriculture, Rawalpindi	Master of Science	Zoology	1 <sup>st</sup> Division 3.21/4
Allama Iqbal Open University, Islamabad	Bachelor of Education	Zoology, Chemistry	1 <sup>st</sup> Division
Government Degree College for women, Hasilpur	Bachelor of Science	Zoology, Botany Chemistry	1 <sup>st</sup> Division
Government Degree College for women, Hasilpur	Higher Secondary school Certificate	Pre-Medical	1 <sup>st</sup> Division
Government Girls High School No:1, Hasilpur	Secondary School Certificate	Science	1 <sup>st</sup> Division

**Teaching & Research Experience:** 6 years

#### **Publications:**

- Akhter, S., M. S. Ansari, **Bushra Allah Rakha**, S. M. H. Andrabi and N. Ullah. 2010. Cryopreservation of buffalo (*Bubalus bubalis*) semen in Bioxcell<sup>®</sup> extender. *Theriogenology*, 74: 951-955.
- Ansari, M. S., **Bushra Allah Rakha**, S. M. H. Andrabi and S. Akhter. 2010. Usefulness of powdered and fresh egg yolk for cryopreservation of Zebu bull spermatozoa. *Reproductive Biology*, 10: 235-240.
- Akhter, S., **Bushra Allah Rakha**, S. M. H. Andrabi, M. S. Ansari. 2010. Comparison of egg yolks from three avian species in extender for cryopreservation of Sahiwal bull epididymal spermatozoa. *Animal Science Papers and Reports*, 29: 131-138.
- Ansari, M. S., **Bushra Allah Rakha**, N. Ullah, S. M. H. Andrabi, S. Iqbal, M. Khalid and S. Akhter. 2010. Effect of exogenous glutathione in extender on the freezability of

- Nili-Ravi buffalo (*Bubalus bubalis*) bull spermatozoa. Animal Science Papers and Reports, 28: 235-244.
- v) Akhter, S., M. S. Ansari, **Bushra Allah Rakha**, S. M. H. Andrabi, N. Ullah and M. Khalid. 2011. Effect of low density lipoprotein on freezability and fertility of buffalo (*Bubalus bubalis*) bull semen. Theriogenology, 76(4): 759-764.
- vi) Ansari, M. S., **Bushra Allah Rakha**, S. Akhter. 2011. Effect of L-cysteine in extender on post-thaw quality of Sahiwal bull semen. Animal Science Papers and Reports, 29: 197-203.
- vii) Ansari, M. S., **Bushra Allah Rakha**, S. M. H. Andrabi and S. Akhter. 2011. Effect of straw size and thawing time on quality of cryopreserved buffalo (*Bubalus bubalis*) semen. Reproductive Biology, 11: 49-55.
- viii) Akhter, S., M. S. Ansari., **Bushra Allah Rakha**, N. Ullah, S. M. H. Andrabi, M. Khalid. 2011. *In vitro* evaluation of liquid-stored buffalo semen at 5°C diluted in soya lecithin based extender (Bioxcell®), tris-citric egg yolk, skim milk and egg yolk-citrate extenders. Reproduction in Domestic Animals, 46: 45-49.
- ix) Akhter, S., M. S. Ansari, S. M. H. Andrabi, **Bushra Allah Rakha**, N. Ullah, M. Khalid. 2012. Soya-lecithin in extender improves the freezability and fertility of buffalo (*Bubalus bubalis*) bull spermatozoa. Reproduction in Domestic Animals. 47(5): 815-819. (*Impact factor: 1.356*)
- x) Muhammad, A., S. Ansari, **Bushra Allah Rakha**, Syed M. H. Andrabi, Nemat Ullah, Razia Iqbal, William V. Holt, Shamim Akhter. 2012. Glutathione-supplemented tris-citric acid extender improves the post-thaw quality and *in vivo* fertility of buffalo (*Bubalus bubalis*) bull spermatozoa. Reproductive Biology, 12: 271-276.
- xi) Qadeer, S., A. Batool, K. Mehboob, M. S. Ansari, **Bushra Allah Rakha**, S. M. H. Andrabi, N. Ullah, R. Iqbal, S. Akhter. 2012. Comparison of traditional antibiotic streptomycin with neomycin, polymyxin B or Colistin in extender for buffalo (*Bubalus bubalis*) bull spermatozoa. Journal of Applied Animal Research. (Accepted).

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#### 4. Curriculum Vitae

Name: **Muhammad Rais**  
 Position/Address: Lecturer (Wildlife Management), Department of Wildlife Management, PMAS-Arid Agriculture University Rawalpindi, Pakistan. 46000.  
 Cell: 011-92-332-5442050  
 Email: [sahil@uaar.edu.pk](mailto:sahil@uaar.edu.pk)

#### Education

<b>Ph. D.</b>	Karachi University	2012	---
<b>M. Sc.</b>	Karachi University	2004	1 <sup>st</sup> Position
<b>B. Sc. (Hon.)</b>	Karachi University	2003	1 <sup>st</sup> Division
<b>F. Sc.</b>	Karachi Board	2000	1 <sup>st</sup> Division
<b>Matric</b>	Karachi Board	1998	1 <sup>st</sup> Division

#### **Academic and Research Experience**

- Currently working as a lecturer in the department of Wildlife Management at PMAS Arid Agriculture University Rawalpindi.
- Sixteen months teaching experience as a lecturer in Zoology at Bahria College N.O.R.E I, Karachi.

#### **Professional Trainings in Herpetology**

- Six-months short term training in monitoring movement patterns of reptiles, October 2012 to March 2013 (Cont.), Indiana-Purdue University Fort Wayne, USA.

- ii) 5<sup>th</sup> School in Herpetology. 25 February to 10 March, 2012. North Orissa University, Orissa, India.

### **Publications**

#### **Published (21) (IF=4.124) (Citations=11)**

- i) Khalique, M., Rais, M., Mehmood, T., Anwar, M., Ali, S., Bilal, S. and Kabeer, B. 2012. Study on some waterfowls of Mangla Dam, Azad Jammu and Kashmir. *Berkut*. 21 (1-2): 44-49.
- ii) Rais, M., Baloch, S., Rehman, J., Anwar, M., Hussain, I. and Mehmood, T. 2012. Diversity and conservation of amphibians and reptiles in North Punjab, Pakistan. *Herpetological Bulletin*. 122: 16-25.
- iii) Rais, M. 2012. Killing rare serpent. *IRCF Reptiles and Amphibians*. 19 (01):80.
- iv) Mehmood, T., Hussain, R., Rais, M., Hussain, I. and Nadeem, M.S. 2012. Habitat Analysis and Population Estimates of Three Falcon Species, Red-headed Merlin (*Falco chicquera*), Common Kestrel (*Falco tinnunculus*) and Saker Falcon (*Falco cherrug*), Inhabiting District Chakwal, Pakistan. *Pakistan Journal of Zoology*. 44 (3): 787-798. **(Impact factor=0.338) (Citations=03)**
- v) Mehmood, T., Siddiq, M.K., Rais, M. and Nadeem, M.S. 2012. Distribution and Relative Abundance of Freshwater Turtles in Korang River Islamabad- Rawalpindi, Pakistan. *Pakistan Journal of Zoology*. 44 (3): 889-893. **(Impact factor=0.338)**
- vi) Tabassum, F., Rais, M., Anwar, M., Mehmood, T., Hussain, I. and Khan, S.A. 2011. Abundance and Breeding of the Common Skittering Frog (*Euphlyctis cyanophlyctis*) and Bull Frog (*Hoplobatrachus tigerinus*) at Rawal Lake, Islamabad, Pakistan. *Asiatic Herpetological Research*. 2(4): 245-250. **(Impact factor=0.294)**
- vii) Mahmood, T., Shah, S.M.A., Rais, M. and Nadeem, M.S. 2011. An Investigation of Animal species Trade at pet shops of Rawalpindi and Multan cities. *Journal of Animal and Plant Sciences*. 21(4):822-829. **(Impact Factor: 0.585)**
- viii) Rais, M., Anwar, M., Mehmood, T. and Hussain, I. 2011. Bird diversity and conservation at Kallar Kahar Lake with special reference to water birds. *Pakistan Journal of Zoology*. 43 (4): 673-681. **(Impact factor=0.338) (Citations=02)**
- ix) Rais, M., Khan, M.Z., Abbass, D., Akber, G., Nawaz, R. and Islam, S. 2011. A qualitative study on wildlife of Chotiari Reservoir, Sanghar, Sindh, Pakistan. *Pakistan Journal of Zoology*. 43 (2): 237-247. **(Impact factor=0.338) (Citations=01)**
- x) Bilal S., Rais M., Anwar M., Mahmood T., Hussain I., Nadeem M.S. 2011. Trend in the diversity of migratory ducks at Rawal Lake, Islamabad. *Berkut*. 20 (1-2): 65-69.
- xi) Mahmood T., Amin N., Rais M. 2011. Captive breeding of Demoiselle Crane in Lakki Marwat, Khyber Pakhtunkhwa, Pakistan. *Berkut*. 20 (1-2): 153-158.

### **Oral presentations**

Rais, M., Khan, M.Z., Nawaz, R., Akber., G. and Islam, S. Global significance of Chotiari Wetlands Complex (Sangahr, Sindh, Pakistan) and its wildlife. Abstracts: 2<sup>nd</sup> World Biodiversity Congress organized by Century Foundation, Bangalore, India, 8-12th September 2011 in Kuching, Sarawak, Malaysia. 31p.

A Baseline study on Wildlife Diversity of Kallar Kahar Lake, Chakwal, Punjab. Abstracts: 31<sup>st</sup> Congress of Zoology organized by Zoological Society of Pakistan, Muzafferabad University, April 19-21, 2011, Muzafferabad, AJK.

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