

**PAKISTAN-GERMAN COOPERATION  
IN FORESTRY RESEARCH AND EDUCATION  
AT THE  
PAKISTAN FOREST INSTITUTE**

1981-1990

by

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**INTRODUCTION**

Pakistan inherited a very small forest area (4.5%) in 1947. With the result that, over the years, a significant part of the country's requirement of timber and wood products had to be imported. At the same time, the pressure on the indigenous forest resources continued to rise, increasing the demand for timber and pushing up its price steeply. Until early seventies, the forests in Pakistan were harvested by private contractors, who became heavily involved in malpractices, and institution of private contracts came into serious disrepute and was abolished. Since mid-seventies all the provinces of Pakistan are carrying out their timber harvesting and marketing either departmentally (Punjab and Sindh) or through public corporations (NWFP and Azad Kashmir). In the beginning, all these organizations were using tools and methods of forest contractors because there were no arrangements within the country to train the staff in improved methods of tree felling, conversion and transportation and for conducting research to find out the best methods for the local conditions.

In order to establish a nucleus of research and training in the fields of logging and forest products engineering, a development project entitled "Development of Training and Research Facilities in Forest Products Engineering and Logging at the Pakistan Forest Institute, Peshawar" was prepared in September, 1978 and submitted to the Government of Pakistan. The project was sent to the Federal Republic of Germany to seek their financial assistance for its foreign exchange requirement. As a part of the technical cooperation in the forestry sector between the government of the Federal Republic of Germany and the Islamic Republic of Pakistan, a German appraisal-mission visited Pakistan in May 1979 to investigate the feasibility of German technical assistance to the Pakistan Forest Institute, Peshawar. The members of the

mission recommended a project for the development of training and research facilities in the fields of Forest Products and Logging. Accordingly, a PC-I proposal was submitted by the Pakistan Forest Institute to the Government of Pakistan, which became operative in 1980-81 for a period of five years. The project was continued as Phase-II up to June 1990 including a one year extension period. Phase-II of the project, besides the continuation of the objectives of Phase-I, also contained technical assistance in the field of Silviculture and Forest Management.

The German contribution to the project was in the form of long- and short-term experts, provision of machinery, tools and equipment for research and education in Forest Engineering, Forest Products and Management and advanced training of counterparts in Germany or other countries.

The Government of Pakistan provided research, as well as technical staff and funds for all operational activities of the project. Details of major activities and achievements are briefly described below.

## ACTIVITIES

### Training and Education

Training and education, the most important component of the project, comprised of foreign and local training of counterpart staff, forestry students, officers of provincial forest departments/organizations and wood-based industries. These activities can be divided into the following two main groups depending upon the duration of the training, either long or short-term.

#### Long-term foreign training

12 counterparts were trained in Germany, U.K. and USA. Out of these, 5 completed their training up to Ph.D level (Forest Products, Forest Engineering, Silviculture and Management), 3 did their M.Sc. degrees (Forest Products and Forest Engineering) and 4 underwent one year advanced training in Germany (Forest Products and Forest Management).

#### Short-term, foreign training

Under this programme 8 counterpart officers had the opportunity to attend study tours, international congresses, seminars, and training courses for a duration of 1 to 3 weeks related to the main fields of the project activities.



### Long-term local training

The major achievement of the project was the initiation of a long-term local training programme up to M.Sc. level with specialization in Forest Products and Forest Engineering. Such a programme of forestry education at Pakistan Forest Institute was essential to improve the forest operations and wood utilization in Pakistan. In this respect 31 students from various provincial forest departments/organizations completed their specialised M.Sc. forestry degree. Details are given in Appendix I.

### Short-term local training

During the period of implementation of the project, a number of short-term courses (5-10 days) were conducted in different fields of Forest Products, Forest Engineering and Silviculture, Forest Management by PFI staff and project experts. The trainees represented Pakistan Forest Institute, provincial forest departments/organizations, other Government agencies and wood industries. Subjects of these courses and number of participants trained are shown in Appendix II.

### Research

The cooperation in research included the provision of technical advisory services, advanced training of research staff of PFI and the supply of necessary equipment and machines.

Besides introducing new research fields such as timber harvesting and transportation, forest road planning and construction and forest ergonomics, the existing research activities in the fields of Forest Products, Silviculture and Forest Management were also intensified. The research was not confined only to laboratory work at PFI but was also carried out in the field. For this purpose, a Research and Training Field Station was established in the Reserved Forests of the Siran Forest Division at Shinkiari. The Field Station comprises of a building complex and a forest area of about 1500 ha.

The research staff of PFI, in collaboration with the project-experts, identified the research topics, elaborated the study plans and conducted the research in the following aspects of above mentioned fields:

### Forest Engineering

- Productivity and cost calculation of different forest operations
- Testing and efficiency of improved and traditional tools in timber harvesting
- Estimation of rate of erosion on forest road surface with respect to various factors
- Opening up planning and forest road lay-out
- Ergonomic studies on forest workers

### Forest Products

- Studies on the physical and mechanical properties of the local timbers
- Tests on the natural durability of timbers and efficiency of different preservatives
- Air-seasoning techniques
- Utilization of lesser known timbers in the manufacture of board products
- Studies on the laminated wood structures
- Manufacture of mineral bonded board products

### Silviculture and Forest Management

- Studies on natural regeneration of the moist temperate forests
- Regeneration potential of Chir Pine
- Spacing experiment of Deodar
- Forest resource inventory
- Forest management planning
- Preparation of yield tables for important conifer species of Pakistan

- Range Management experiments (improvements of pasture land)
- Tree improvement and breeding

Most of the research results have already been reported in the form of publications (Appendix III). Some experiments are of long-term nature and need to be continued and maintained until completion, after the Pak-German cooperation terminates in June, 1990.

#### ACKNOWLEDGEMENTS

Technical assistance of the Government of Federal Republic of Germany for the Institute project is gratefully acknowledged. This includes a number of experts who were provided by the Government of Federal Republic of Germany to assist the Pakistan Forest Institute in its research and training activities. They were both long term and short term experts. The Institute feels indebted to all of them for their meritorious and dedicated services in this regard. We are grateful to them for their valuable assistance and support. The names of long term and short experts are given below. Of course the list does not include those gentlemen who helped Pakistani staff during its training in Germany and other countries. However, their help is also acknowledged.

##### Long-term experts

Dr. Wolf Guglhoer, Mr. Wulf Killmann, Mr. Claus Walcher, Dr. Gerhard Stoehr, Dr. Michael Kleine and Mr. Klaus Brunner.

##### Short-term experts

Prof. Dr. Hans Loeffler, Dr. Christoph Riechert, Prof. Dr. Juergen Huss, Prof. Dr. Arno Fruehwald, Dozent Dr. Gerd Wegener, Mr. Bruno Abegg, Dr. Konrad Uebelhoer, Dr. Klaus Johann, Dr. Hubert Duerrstein, Prof. Anton Trzesniowski, Prof. Dr. Peter Burschel, Dr. Robert Holzapfl, Dr. Bernd Strehlke, Mr. Jakob Laiminger, Dr. Peter Hoeppe, Dr. Bernd Liss, Prof. Dr. F. B. Thompson, Mr. Josef Hertenberger, Prof. Dr. Hans Steinlin, and Dr. Fritz Pfister.



## Appendix I

Specialized M.Sc. Forestry course and number of trainees  
from various forest departments/organizations  
in 1981-83 to 1987-89 sessions

Forest Department/ Organization	Forest Engineering	Forest Products	Total
1. Azad Kashmir	2	-	2
2. Azad Kashmir Logging and Sawmilling Corporation	1	-	1
3. Northern Areas	1	-	1
4. Punjab	9	4	13
5. N.W.F.P., Forest Development Corporation	1	-	1
6. N.W.F.P., F.D.C.	6	2	8
7. Sindh	2	1	3
8. P.F.I.	1	1	2
Total	23	8	31

## List of Short Courses

## Appendix II

Sl. No.	Title of Course	Duration			No. of participants	Nominating Organization
		From	-	To		
1.	Wood Technology and Identification	15.5.82	-	27.5.82	17	Pak. Army, WAPDA
2.	Power Chain Saw Operation and maintenance	7.3.83	-	7.4.83	8	PFI, KIFMP
3.	Chain Saw Operation and maintenance	9.4.83	-	14.4.83	9	NWFP, Forest Development Corporation (FDC)
4.	Chain Saw Operation and maintenance	18.6.83	-	28.6.83	43	Forest School Bahawalpur
5.	Road Alignment Course	28.10.83	-	3.11.83	5	N.W.F.P. F.D.C
6.	Power Chain Saw Operation and maintenance	22.2.84	-	5.4.84	9	Pakistan Forest Institute (PFI), KIFMP
7.	Skidder Operation Course	3.5.84	-	19.5.84	4	PFI
8.	Course for training of Forest Guards in Logging Tools	22.7.84	-	26.7.84	85	Punjab Forest School, Ghoragali
9.	Chain Saw Operation and maintenance	1.1.85	-	20.2.85	14	PFI, F.D.C., KIFMP

10.	Wood Technology and Identification	9.2.85-14.2.85	16	Pak.Army, PAF, Pak.Navy
11.	Modern Logging Methods like direction felling, handling of Chain Saw and Skidding by Winch	14.2.85-30.4.85	5	N.W.F.P. F.D.C.
12.	Timber Technology and Wood Identification	11.5.85-14.5.85	11	Pak.Army, PAF, Pak.Navy
13.	Ergonomics and Logging Course	24.11.85-6.12.85	18	Provincial Forest Departments, PFI
14.	Wood Technology and Identification	14.12.85-19.12.85	43	P.O.F. Wah, Pak.Army, PAF, Pak. Navy
15.	Wood Technology and Identification	1.11.86-6.11.86	27	F.D.C., Pak. Army, POF Wah, WAPDA, Private Industry, Pak.Navy
16.	Forest Opening Up Road Alignment and Cost Calculation	7.2.87-12.2.87	11	AKLASC, F.D.C.
17.	Annual Ring Measurement with the System Digital Positiometer	9.8.87-12.8.87	4	PFI
18.	Workshop on Forest Management Planning in the High Hill Forest of Pakistan	22.11.87-26.11.87	14	PFI, F.D.C. F.D. and



19.	Nursery Techniques in Forestry	17.1.88-28.1.88	8	PFI, Pak- German, IRDP, Private Industry
20.	Wood Technology and Identification	9.4.88-14.4.88	12	F.D.C., Pak. Army, POF Wah
21.	Power Chain Saw Training	10.1.89-18.1.89	11	Remount Deptt. Mona
22.	Wood Technology and Identification	11.3.89-16.3.89	9	Pak.Army, PAF, F.D.C., Pak.Navy, POF Wah
23.	Saw Doctoring	10.6.89-15.6.89	8	F.D.C., Wood Working Service Centre, Gujrat, Wood Working Centre, Peshawar, Private Industry, PFI
24.	Organization of Meteorological Station Recording and Interpretation of Meteorological Data	10.9.89-14.9.89	15	F.D., Punjab, F.D.C., PFI
25.	Computer aided Opening Up and Harvesting Planning		6	N.W.F.P. F.D.C., PFI, FD, AK
26.	Wood Technology	3.2.90-8.2.90	25	Military Engineering Service
27.	Wood Technology	10.3.90-12.3.90	11	Military Engineering Service

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Appendix III

LIST OF PUBLICATIONS

Forest Engineering

1. Recent developments in Timber Harvesting in Pakistan. In: IUFRO Symposium: Role of Forest Research in Solving Socio-economic Problems in the Himalayan Region, 17.-27.10.1987, K. M. Siddiqui, Pakistan Forest Institute, Peshawar, 1987.
2. Cable logging in the outer himalayan mountain forests: needs and limitations In: IUFRO Symposium: Role of Forest Research in Solving Socio-economic Problems in the Himalayan Region, 17.-27.10.1987, G. Stoehr, Pakistan Forest Institute, Peshawar.
3. Living conditions of forest workers in Pakistan. In: IUFRO Symposium: Role of Forest Research in Solving Socio-economic Problems in the Himalayan Region, 17.-27.10.1987, M. Ayaz, Pakistan Forest Institute, Peshawar, 1987.
4. Ergonomic Research in Forestry. In: IUFRO Symposium: Role of Forest Research in Solving Socio-economic Problems in the Himalayan Region, 17.-27.10.1987, M. Ayaz, Pakistan Forest Institute, Peshawar, 1987.
5. Cable crane logging in high hill forests in Pakistan as part of improved intensive forest management. In: Symposium on Skyline logging, Portland, 1988, G. Stoehr, H. Beigl, M. Ayaz, K. Anwar, 1988.
6. Case study of opening up project in Siran Forest Division, NWFP, Pakistan. In: Compilation of Courses on Opening up Planning and road construction in the Hill Forests of Hazara Civil Division, G. Stoehr, M. Ayaz, M. Iqbal, Pakistan Forest Institute, Peshawar, 1988.
7. Performance of tools in tree felling and conversion in Changa Manga Plantation, M. Ayaz, Pak. Jour. For., 37(3), 1987.
8. Timber harvesting tools and work stress in irrigated plantations. M. Ayaz, Pakistan Forest Institute, Peshawar, 1988.
9. Noise level of different machines in the sawmill of NWFP. Forest Development Corporation, Mansehra. M. Ayaz. Pak. Jour. For., 39 (3), 1989.

10. Comparison of timber harvesting systems in the forest areas of Hazara Civil Division, M.Ayaz, G. Stoehr, Pak.Jour.For., Vol.38, No.4, 1988.
11. Compilation of Courses on Opening Up Planning and Road Construction in the Hill Forests of Hazara Civil Division, N.W.F.P., Pakistan. Pak.German Project, Pakistan Forest Institute, Peshawar, 1989.
12. Machine Cost Calculation - an example in a road building Project in Siran Forest Division, NWFP. G. Stoehr, Pak.Jour.For., Vol. 39, No.3, 1989.

### Forest Products

13. Identification of some of the common commercial timbers of Pakistan, Forest Products Research Division, S.S. Ahmed, M. Ayaz, Pakistan Forest Institute, Peshawar, 1986.
14. Forest Products Research Needs in Pakistan. Forest Products Research Division. K. M. Siddiqui, Pakistan Forest Institute, Peshawar, 1986.
15. Properties and uses of Pakistani timbers. Forest Products Research Division. K. M. Siddiqui, M. Azay, and I. Mahmood, Pakistan Forest Institute, Peshawar, 1986.
16. Comparison of anatomical, physical and mechanical properties of Abies pindrow, Cedrus deodara and Pinus wallichiana from dry and wet temperate forests. K.M. Siddiqui, J. A. Khan and I. Mahmood, Pak.Jour.For., 39(1), January, 1989.
17. Effect of wood density on the strength properties of particle board. M.Yasin, Pakistan Forest Institute, Peshawar, 1986.
18. The effect of various factors on the uptake and movement of copper and arsenic in Eucalyptus globulus. Pak.Jour.For.39(2) April, 1989. pp:95-101.
19. Bonding strength of local commercial adhesives (I). M. Yasin, Pak.Jour.For., 38(4), 1988.
20. Quantity of water solubles of some hardwood species. (A basis for their relative suitability in wood cement boards). M. Yasin and T. Qureshi, Pak.Jour.For., 39(2), 1989.



21. Suitability of mulberry from different localities in Pakistan for sports good manufacture. K. M. Siddiqui and I. Mahmood, Forest Products Research Division, Pakistan Forest Institute, Peshawar, 1985.
22. A note on physical and mechanical properties of walnut (Juglans regia) wood grown in Pakistan. K. M. Siddiqui and I. Mahmood. Pak.Jour.For., 36(2), April, 1986.
23. A note on physical and mechanical properties of Eucalyptus tereticornis, E. sidroipholia and E. ketsoniana. K. M. Siddiqui and I. Mahmood, Pak.Jour.For., 36(3), July, 1986.

#### Silviculture and Forest Management

24. Proceedings of Workshop on Forest Management Planning in the High Hill Forests of Pakistan. 22-26.11.1987. Forestry Research Division, Pakistan Forest Institute, Peshawar, 1988.
25. The Relascope and its Use in Forest Inventory Work. M. A. Cheema, M.Kleine, Pak.Jour.For.1, Vol.38, No.3, 1988.
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27. Analysis of silviculture and forest management problems with the help of inventory data. In:Proceedings of Symposium on Silviculture and Genetic Improvement of Forest Species, Argentina, 1987. M. Kleine, 1987.
28. Forest Resource Inventory of the Forests of Research and Training Field Station. M. A. Cheema, M. Kleine, 1989, Pakistan Forest Institute, Peshawar.

#### General

29. Proceedings of Symposium: Role of Forest Research in Solving Socio-economic Problems in the Himalayan Region. Pakistan Forest Institute, Peshawar, 1988.
30. Forests and Forestry in Pakistan. M.I. Sheikh, Pakistan Forest Institute, Peshawar, 1987.

31. Role of research in improving socio-economic conditions of the people living in the Himalayas. In: IUFRO Symposium: Role of Forest Research in Solving Socio-economic Problems in the Himalayan Region, 17-27.10.1987. M. I. Sheikh, Pakistan Forest Institute, Peshawar, 1987.
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34. Cook stoves and fuelwood conservaton; some issues. K. M. Siddiqui, Pakistan Forest Institute, Peshawar, 1988 (unpublished).
35. Waldbau-ertragskundliche Forschung im Bergwald Nordpakistans. M.Kleine, Oesterreichische Forstzeitung 1/1988.
36. Die Bedeutung des Waldes fuer Bergbauern in Pakistan. M.Kleine, Blick ins Land; Oesterreichische Landwirtschaftszeitung. 10/1988
37. Research and Training Field Station at Shinkiari (Information Brochure), Pakistan Forest Institute, Peshawar, 1989.