Deccan College Post Graduate and Research Institute (Deemed University), Pune- 411 006.

Platinum Jubilee Year 2014-15

Report

On

One week 'winter School'

In

"Quaternary Geoarchaeology and paleoenvironment"

Organized

During 8th-13th December, 2014

At

Department of Archaeology.

About the course

Landscape evolution involves changes in both the physical and biological features of the earth's surface. One must examine the factors associated with the sediment-soil system and the biologic evidence available in the deposits to analyze the evolution of prehistoric landscapes and place it within a geoecologic context. The mechanisms that influence spatial and temporal variation in habitat contexts are critical to archaeological interpretation. In addition to techniques pertaining to sedimentological and pedogenic evidence, a variety of paleo-ecological methods based on biologically derived contexts or chemical signals found in deposition can be employed.

The inference of past environmental conditions from the remains of plants and animals found in sediments or soils relies on the same kinds of taphonomic and site formation principles used to interpret the archaeological record. The initial, dynamic, living populations of plants and animals can be altered by a variety of pre- and post- depositional processes.

The archaeological remains and monuments always rest on geological materials i.e. loose and hard material of earth surface and it is also a fact used most of the times. These are covered with soil sediments resulting from river flood, wind, storm, high tide, etc. In order to understand the paleoenvironmental conditions that prevailed before and after abandment of sites there is a need to investigate lower and upper levels of sediments, in which the site is sandwiched. This analysis includes stratigraphical and sedimentological data, heavy minerals, soil chemistry, and paleontological study of these beds. The department of Archaeology at the Deccan College excavates a number of such sites every year, in different parts of our country.

Keeping this view in the mind, of the Deccan College organized one week winter school on "Quaternary Geoarchaeology and paleoenvironment" from 8th to 13th December, 2014, as part of celebration of the Platinum Jubilee of the institute, in the Department of Archaeology.

The course covered various topics such as

i. The environmental disasters previous kinds and associated sedimentary processes, as seen in the past sedimentary record.
ii. The distribution and variability of monsoon, predictability, modeling and paleo-monsoon records.
iii. The different geological periods, their climatic conditions and their suitability for the flora-fauna study based on their records on the Indian subcontinent.
iv. Quaternary as chronostratigraphy unit, subdivisions, standard strato-type sections and climatic episodes.
v. The response of human societies to changes in natural systems and climate (e.g., ocean, glacier, river, lake, desert, vegetation) as revealed by archaeological excavations.
vi. Methods, tools and techniques used in Quaternary geology.
vii. Retrospect on Indian Quaternary, future scope, status and relation with global records.
viii. Practical exercises, field and laboratory work.
ix. Group discussion on various themes of Quaternary.
x. Presentation based on field problems of the participants.
xi. Audio-video session based on paleoenvironmental aspect.

The Department of Archaeology is a premier department for heritage studies in the country. It was founded in 1939, by the legendary archaeologist, the late Professor H.D. Sankalia. During the last 75years it has excavated major prehistoric and historical sites in various parts of the country and published a number of reports and monographs. More than 250 Ph.D. dissertations have so far been completed in prehistory, protohistory, ancient Indian history as culture, and archaeological science. Attached to this Department are science laboratories for archaeo-chemistry, geoarchaeology, archaeo-zoology, archaeo-botany and biological anthropology.

Geoarchaeology or environmental archaeology is one of the important branches of archaeology which deals with the study of the earth's surface. Therefore, the various shape and size aspects of the sediments which weathered and eroded from the various activities deposited in the basin, follows stratigraphical sequence. This material roughly lakhs before the present i.e. Quaternary era is highly important for human culture. Therefore, such flora and fauna rich sediments give all types of information regarding the depositional environment of the sediment. Therefore, it is -- possible to reconstruct Palaeoenvironment. In this way, the interdisciplinary aspect is highly important.

Program Details:

Day Ist (Tuesday: 08/12/2014)

	Inaugural Function
Time	**Schedule**
9:30am	Registration
	Inaugural Function
10:30am	Lightning of Lamp,
	Welcome and Introduction of Guest
10:40am	Felicitation of guests from different Institutes

By Prof. Vasant Shinde:

Chief guest Dr. N.N. Maldar, VC, Solapur University, Solapur.

Guest of Honor Dr. Ravindra Pardeshi, Principal Ferguson College, Pune.

Key Note speaker: Dr. S.N.Rajguru

Dr. Bagade S.P. Former Director, Ground Water Survey and Development Agency, Pune

Dr. Uttam Director, ISRO, (Pune Cell)

Shri. Gurjar U.N., Director, Survey of India, Pune.

Shri Hemant Athavale, Former Director, Geological Survey of India, Pune.

Dr. Beniyani, Botonical Survey of India, Pune.

Shri. Ramteke, Additional Director, CWPRS, Khadakwasla, Pune

Shri. Jain, Director, Central Ground Water Board, Nagpur.

Dr. Milind Panpatil, Director, National Water Academy, Pune.

Shri. Pravin Ladkat, Chief Engineer, Maharashtra Jeevan Pradhikaran, Pune.

Shri. Tambe, Chief Environmental Engg. Pimpri Chinchwad Municipal Corporation, Pune.

Shri. Aade Sir, Directorate of Irrigation and Research Institute, Pune.

Prof. S.S. Thigale, Honorary Director, Symbiosis, Pune.

By Prof. S. N. Rajguru

Mr. Jitendra Nath, SA, ASI Mumbai Circle.

Dr. Maya Patil, Deputy Director, State Archaeology Maharashtra.

Mr. Kamble, Asst. Director, ASI, Pune region.

Dr. Kshirsagar, Principal, MIT, Pune.

Dr. Venkat, K.S., Principal, Wadia College, Pune.

By Prof. Sheila Mishra

Prof. Mache, HOD, Geology, Fegusson College, Pune.

Prof. U.D.Kulkarni, HOD, Geology, Wadia College, Pune.

Prof. Sayyed, HOD Geology, Poona College, Pune.

Dr. S.S. Marathe, Former head Department of Geology, GCOEP

Dr. M.S. Randive GCOEP, Pune.

Prof. S.A. Meshram, Head, Engg. Geology, GCOEP,

By Padmashri Prof. K.Paddayya

Dr. Supriyo Chakravarty IITM, Pune

Dr. Hemant Borgaonkar IITM, Pune.

Dr. Ravindra Oak, River Engg. Division, CWPRS, Pune.

Dr. Arun Bapat, Seismological Division, CWPRS, Pune.

Shri. Chaudhari,Geophysics Division, CWPRS, Pune

By Prof. Jayashri Sathe

Dr. Shrikant Karlekar SP College, Pune.

Dr. Rai ISCER, Pune

Prof. Borkar V. D. ARI, Pune.

KPN Kumaran, ARI, Pune.

Dr. C. Rajshekhar ARI, Pune.

10:55am	Importance of the Winter School-Prof. P.D. Sabale
11:05am	Address by Vice Chancellor: Prof. Vasant Shinde
11:20am	Address by Chief Guest's speech
11:30am	Address by Guest of Honor: Dr. Pardeshi R. G.
12:20pm	Address by President : Dr. G.B. Deglurkar
	Key Note Address: Dr. S.N. Rajguru
12:30pm	Vote of thanks by HOD Archaeology: Prof. Sheila Mishra
12:40pm	*Tea break*
	Group Photo
	Academic Session
12:50pm	Dr. Uttam Director, ISRO, (Pune Cell) Speech on Research
	Projects in Remote Sensing
01:00pm	Dr. Vasant Shinde – Vice Chancellor, DCPRI, Pune.
	(Topic: *Development and decline of Harappan Civilization: Environmental Perspectives*.)
01:40pm	*Lunch Break*
2:30 to 3:15pm	Dr. Vishwas Kale- Head, Deptt of Geography,
	SPPU, Pune.

*(*Topic: *Late Holocene Paleofloods Records from monsoon-fed rivers, India).*

3:15 to 4:00pm Dr. Bagade S. P. –Former Director, GSDA, Pune

(Topic: *Water Management: Present and Past*)

4:00 to 4:15pm Tea Break

4:15 to 5:15pm Dr. Arun Bapat –CWPRS, Pune.

(*Paleo-tsunami along West Coast of India*)

5:15 to 5:45pm Prof. Borkar V. D. –ARI, Pune.

(*Megafossils as a tool for paleoenvironment*)

5:45 to 6:00pm Visit to Museum and Department

Day 2nd (Tuesday: 09/12/2014)

Time	**Event**	**Topic**	**Name of Expert**
9.00 to 10.15	Lecture	Effect of Paleoflood on archaeological sites in Bhima river basin.	Prof. P. D. Sabale DCPRI, Pune.
10:15 to11:00	Lecture	Sedimentological Analysis	Prof. D.C. Meshram
11.00 to11:15	**Tea Break**		
11.20 to 12:00	Lecture	Stable Isotopes: A tool to understand the past climate and natural processes.	Dr. Supriyo Chakravarty IITM, Pune
12.00 to 12:45	Lecture	Rock Art	Dr. Shrikant Jadhav
12:45 to 1:30	Lecture	Tree-ring as climate proxy: Introduction to Dendroclimatology	Dr. Hemant Borgaonkar IITM, Pune.
1:30 to 2:30	**Lunch break**		
2.30 to 3.15	Lecture	Quaternary Sea Level Changes and Archaeological Records of West coast of India	Prof.Sushma Deo, DCPRI, Pune.
3:15 to 4:00	Lecture	Engineering Properties of Quaternary deposit.	Dr. M.S. Randive GCOEP, Pune.
4.00 to 4.15	**Tea Break**		
4.15to 5.15	Practical	Sedimentology / Archaeozoology	Shri. Prafull Kamble / Dr. Arati Mukharjee
5.15 to 5.45		Documentary/ Discussion/ Feedback	

Day 3rd (Wednesday: 10/12/2014)

Time	Event	Topic	Name of Expert
9.00 to 10.15	Lecture	Role of Sciences in Archaeology.	Padmashri. Dr. K. Padayya DCPRI, Pune.
10:15 to11:00	Lecture	Geological and Paleontological aspect of rock art: An integrated Approach.	Dr. G.L. Badam DCPRI, Pune.
11.00 to11:15	**Tea Break**		
11.20 to 12:00	Lecture	Prehistoric archaeology an earth science	Prof. Sheila Misra DCPRI, Pune.
12.00 to 12:45	Lecture	Application of Archaeological shells in the reconstruction of Quaternary paleoenvironment.	Dr. Arati Deshpande-Mukharjee DCPRI, Pune.
12:45 to 1:30	Lecture	Quaternary vertebrate fauna and paleoenvironments : 21st century perspectives.	Prof. V. Sathe DCPRI, Pune.
1:30 to 2:30	**Lunch break**		
2.30 to 3.15	Lecture	Environment and environment	Padmashri. Dr. M. Dhavalikar DCPRI, Pune.
3:15 to 4:00	Lecture	Engineering aspects of river bahaviour.	Dr. Ravindra Oak CWPRS, Pune.
4.00 to 4.15	**Tea Break**		
4.15to 5.15	Practical	Petrographical analysis / Fluorine dating and phosphate Analysis	Prof. P.D.Sabale / Shri Sachin Joshi
5.15 to 5.45		Documentary/ Discussion/ Feedback	

Day 4th (Thursday: 11/12/2014): Field visit to Quaternary Geoarchaeological site i. Chandoli in Ghod River Basin, ii. Junnar, in Kukadi

Day 5th (Friday: 12/12/2014)

Time	Event	Topic	Name of Expert
9.00 to 10.15	Lecture	Recent advances in paleontological research with respect to South and South East Asia (Siwalik to Java)	Dr. G. L. Badam DCPRI, Pune.
10:15 to11:00	Lecture	Initiating Late Quaternary paleo-ecological studies in high altitude areas of Sikkim, Himalaya.	Dr. M. D. Kajale DCPRI, Pune.
11.00 to11:15	**Tea Break**		
11.20 to 12:00	Lecture	Use of Palynology for ecological and environmental interpretation.	KPN Kumaran ARI, Pune.
12.00 to 12:45	Lecture	Mycological investigations and reconstruction of paleoenvironment.	Dr. Kiran Randive
12:45 to 1:30	Lecture	Late Holocene geomorphology of Konkan coast.	Dr. Shrikant Karlekar SP College, Pune.
1:30 to 2:30	**Lunch break**		
2.30 to 3.15	Lecture		
		Paleo-seismology and paleoenvironment of the Western Ghat region.	Dr. Rai ISCER, Pune
3:15 to 4:00	Lecture	Micropalentological analysis and environmental interpretations.	Dr. C. Rajshekhar ARI, Pune.

4.00 to 4.15	**Tea Break**		
4.15to 5.15	Practical	Vertebrate paleontology and Micropaleontology	Dr. V. Sathe / Dr. C. Rajshekhar
5.15 to 5.45		Documentary/ Discussion/ Feedback	

Day 6th (Saturday: 13/12/2014)

Time	**Event**	**Topic**	**Name of Expert**
9.00 to 10.15	Lecture	Quaternary excavation: A case study of Math Pimpri.	Prof. P. D. Sabale DCPRI, Pune.
10:15 to11:00	Lecture	Geochemistry and paleoenvironment interpretation.	Prof. P.Prabhakar Solapur University
11.00 to11:15	**Tea Break**		
11.20 to 12:00	Lecture	Role of sea level fluctuations in shaping the ancient coastal cities - Indian Examples"	Dr. Rajiv Nigam NIO, Goa.
12.00 to 12:45	Lecture	Magnetic dating technology and environmental interpretation.	Prof. S. J. Sangode SPPU, Pune.
12:45 to 1:30	Lecture	Deciphering past human-environment interactions in sedimentary archives.	Dr. Rajani Panchang Dhumal ARI, Pune.
1:30 to 2:30	**Lunch break**		
2.30 to 3.15	Lecture	Geophysical investigations and subsurface investigations	Shri. Chaudhari CWPRS, Pune.
3:15 to 4:00	Practical	Field demonstration of Ground Penetration Radar (GPR) and Total Station / Surveys.	Shri. Chaudhari / P. D. Sabale
4.00 to 4.15	**Tea Break**		
4.15to 5.00	Concluding Session	Chief guest by Rajiv Nigam NIO, Goa.	
5.00 to 5.20		Group Photo, participants feedback	

Day 7th (Saturday: 13/12/2014)

Schedule of Valedictory function of Winter School

Time	**Schedule**
4.15 pm	Welcome and Introduction of Guest, by Mrs.Pradnya Kulkarni
4.20 pm	Felicitation of guests
4.25 pm	Review of the Winter School by Prof.P.D.Sabale

4.30 pm	Participants Feedback
4.40 pm	Address by Chief Guest: Dr.Rajiv Nigam (Scientist, NIO)
5.00 pm	Address by Guest of Honor: Prof.S.J.Sangode (HOD, Geology Department, SPPU)
5.10 pm	Dr.G.B.Deglurkar will preside over the function and deliver chairman's Remarks
5.30 pm	Vote of Thanks by Prof.Shiela Mishra (HOD)
5.35 pm	Group Photo

Study Excursion Report

On the fourth day of the winter school, a field study visit was organized. The main purpose of this excursion was to give training to the participants in the field of Quaternary geoarchaeology and paleoenvironment.

a. Chandoli : Quaternary Geo-archaeological site in Ghod river basin.
b. Junnar: Quaternary Geo-archaeological site in Kukadi river basin.

a. Chandoli Quaternary Geo-archaeological site:

This Quaternary geo-archaeological site is located at the right bank of Ghod river(a major left side tributary of Bhima river), South of the present Chandoli habitation site, in Ambegaon tehsil of Pune district. A huge thick and a vertical cliff of about 20m height quaternary deposit is deposited here at the inner convex meander portion of the Ghod in the vicinity of the Chandoli village. A very famous Chalcolithic cultured archaeological site, which was excavated by the Department of Archaeology, Deccan College in 1960 year, is rest on the Quaternary deposit.

In this area as a part of a field training and excavation, a detail study visit is carried out on the 4^{th} day of Winter School i.e. 11^{th} Dec 2014.In this visit near about 36 participants and 4 professors of different interdisplinary (subject expert) such as Dr. S.N. Rajguru (Quaternary Geo-archaeologist), Prof. G.L. Badam (Paleontologist). Prof P.D. Sabale (Co-coordinator of the Winter School and Environmental Archaeologist), and Dr. Shrikant Jadhav (Excavation Director) were present. During this visit the expert have given training in the earth science techniques to the participants.

b. Quaternary Geoarchaeological site at Junnar

It is located on the right bank of Kukadi river, at the southern corner of Junnar town. 25 to 30mts thick Quaternary deposit is formed on the right side meander of Kukadi river channel after the city. This is the thickest Quaternary deposit in the upper reaches of the Bhima river basin. This deposit is overlain by a large early historic (*Satvahana* age), settlement. This site was fortified from its all sides; at some places a well constructed Buruj and gates are preserved.

Saturday: 13/12/14

The Valedictory function of Winter School was organized on the last day, in the evening i.e. after the practical session. Mrs. Pradnya Kulkarni welcomed and introduced the Chief Guest Dr. Rajiv Nigam (Scientist-E, National Institute of Oceanography, Goa). Felicitation of guests was followed by the review of the Winter School by Prof.P.D.Sabale (Convener). Five to six participants from different parts of country have given their feedback about the course, food, accommodation and the department. After this, Chief Guest Dr. Rajiv Nigam, delivered very informative lecture on the 'importance of paleoenvironmental studies as the need of hours'. This main lecture was followed by the chairperson Dr.G.B.Deglurkar (chancellors of the university) remarks and Prof. Vasant Shinde (Vice chancellor) speech.

At the end of the function, Prof.Shiela Mishra (HOD, Archaeology) has given vote of thanks. In the present winter school, nearly 42 guest lecturers were delivered on each and every micro aspect of the subject. The details of the lectures and experts are given in Appendix-I, invitation sent to them and their acceptance with Biodata etc. are given Appendices-II, III, and IV respectively. The photo recording from inaugural to the valedictory function is given in the attachment (Appendix-V)

The list of the candidate which was present for the both Quaternary field training (Appendix-VI) and regular present of students is attached (appendix-VII).

Remark:

On the basis of the feedback from the participants who came from different research institutes, IIT's, Universities and local participants indicate that they were highly satisfied and benefited from the Winter School training and that beyond their expectation they received various kinds of multidisplanary knowledge from eminent scientist/speakers from renowned research institutes in the form of lectures, practical's, field training, audio, video session and group discussion. They said that this kind of training program in Quaternary, geoarchaeology and paleoenvironment is rarely organized by in the country.

Our Institute also got a chance to organize for the first time this Winter School on the occasion of Platinum Jubilee Year 2014-15.

In this winter school the students from other institutes as well as the directors, heads, principal, Emeritus Professors, Eminent Scientists, Engineers and teachers participated and were present from the first day.

I thank to the authorities of Deccan College for providing permission and fund to organize the school on *"Quaternary Geoarchaeology and paleoenvironment* typical topic.

With Regards,

Prof. P.D. Sabale

Convener

(Professor in Paleoenvironment)

Acknowledgements

The "Quaternary geoarchaeology and paleoenvironment" winter school has benefited from the inputs and contribution of many experts and resource persons from the academic community, of in general of the institute from and several other organisations and institutions. Without their co-operation and support, it would not have been possible complete this project successfully.

The coordinator is thankful to the authorities of the Deccan College Post Graduate and Research Institute, (Deemed University), Pune for encouraging me to organize this winter school in the Department of Archaeology. Especially, Dr. G. B. Deglurkar (President), Prof. Vasant Shinde (Vice Chancellor), Shri., Sheila Mishra, and C.V. Joshi (Registrar) for encouragement and financial assistance.

Special thanks are due to Prof. N.N. Maldar (Vice Chancellor, Solapur University, Solapur), Dr. Rajeev Nigam (Chief Scientist, National Institute of Oceanography, Goa), and Prof. S. N. Rajguru (Eminent Scholar in Quaternary Studies). I also extends my sincere thanks to Padamashri Prof. K. Paddayya, and Prof. M. Dhavlikar, former directors and Prof. G.L. Badam and Prof. M. D. Kajale for their continuous encouragement and their guidance.

I am also extend my gratitude, especially to experts coming from of different institutions, connected with environmental studies such as, Dr. Bagade S.P. (Former Director, Ground Water Survey and Development Agency, Pune), Dr. Uttam, Director (ISRO, SPPU, Pune Cell), Shri. Gurjar U.N. (Director, Survey of India, Pune), Shri Hemant Athavale (Former Director, Geological Survey of India, Western region, Pune), Dr. Beniyani (Botanical Survey of India, Pune), Shri. Ramteke (Additional Director, CWPRS, Khadakwasla, Pune), Shri. Jain, Director (Central Ground Water Board, Nagpur), Dr. Milind Panpatil, (Director, National Water Academy, Pune), Shri. Pravin Ladkat, (Chief Engineer, Maharashtra Jeevan Pradhikaran, Pune), Shri. Tambe (Chief Environmental Eng. Pimpri Chinchwad Municipal Corporation, Pune), Shri. Aade Sir (Directorate of Irrigation and Research Institute, Pune), Prof. S.S. Thigale (Honorary Director, Symbiosis, Pune).

I also thank Principal, L. Kshirsagar, (MIT, Pune), Prof. Pardeshi, (Principal), and Prof. Mache, (HOD, Geology) (Fergusson College, Pune), Dr. Vyankatraman K. S. (Principal), Prof. S.J. Sangode

(Head of Department of Geology SP Pune University), and Prof. D.C. Meshram (Department of Geology SP Pune University) Dr. Khan (HOD, Geology) (Wadia College, Pune), Prof. Sayyed (HOD Geology, Poona College, Pune), Dr. S.S. Marathe and Prof. S.A. Meshram (Head, Department of Geology), Dr. M.S. Randive (Geotechnical Engineering Section) Government College of Engineering, Pune and Dr. Shrikant Karlekar, S.P. College, Pune.

I extend my gratitude the scientists of different research institutions such as, Dr. Supriyo Chakravarty, Dr. Hemant Borgaonkar (Indian Institute of Tropical Metrology, Pune), Dr. Ravindra Oak, River Engg. Division, Dr. Arun Bapat, Seismological Division, Shri. Chaudhari, Geophysics Division, from CWPRS, Khadakwasla, Pune, Dr. Rai ISCER, Pune and Prof. Borkar V. D., KPN Kumaran, and Dr. C. Rajshekhar Agarkar Research Institute, Pune.

Thanks are also due to the Ph.D., and Post-Doctoral fellows and Research Project staff for their full and unreserved help and support of various kinds in organizing this course.

With Regards,

Prof. P. D. Sabale

Convener

(Professor in Paleoenvironment)