

PENNSTATE



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**POPULATION AND ECOLOGY  
RESEARCH LABORATORY**

**1997 Annual Report**



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A joint undertaking of the Rural Resources Studies Program, Institute of Agriculture and Animal Science, Tribhuvan University, Nepal and the Population Research Institute, The Pennsylvania State University, USA.

The Population and Ecology Research Laboratory

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Co-Directors

**Directors' Statement**

In 1994 the Institute of Agriculture and Animal Science (IAAS) of Tribhuvan University in Nepal and the Population Research Institute (PRI) of the Pennsylvania State University in the USA began creating a social science research and training institution. The Population and Ecology Research Laboratory (PERL) opened on January 1, 1995. PERL is designed to provide the personnel and infrastructure to carry out large scale social science research projects. PERL staff aim to foster long term, cooperative research and training activities related to population, natural resources and related aspects of social and economic change. Positioned in South central Nepal's Chitwan Valley, just across the border from the Indian State of Bihar, PERL is ideally situated to support social science research into the changes transforming the South Asian region.

During the past three years faculty and staff associates have worked to establish the PERL as a world class research and training institution. In the first two years of its operation, PERL launched two major research projects, trained several IAAS and Penn State students, and hosted a number of exchange visits. PERL researchers trained a staff of fifty survey research interviewers, ten interviewer supervisors, six computer operators, six land use mapping staff, and six flora counting staff. Data collection activities in those years included collection and analysis of more than 150 water samples, mapping land use in 171 neighborhoods, counting flora species on more than 300 plots, and collecting interview data from more than 1000 households and more than 4000 individuals. The PERL computing facility entered data from more than 3500 one hour interviews. Each of these activities contributed to PERL's research, training, and institution building aims.

1997 was another busy year at the PERL. During 1997 survey research staff completed PERL's first two large scale surveys: a 70 minute personal interview of 5271 individuals with a response rate of 98% and a 60 minute household interview of 1802 families with a response rate of 100%. The survey staff also launched two new

surveys: a seasonal agricultural practices survey and a monthly registry of demographic events. The PERL data entry staff completed the *double* entry of all 5721 personal interviews (including a life history calendar) and all 1802 household interviews. Several exchange visits also took place during the year, including the placement of two more PERL staff members in PhD programs at Penn State, further strengthening the ties between Penn State and Tribhuvan University. Once again we feel these activities have moved PERL closer to its research, training, and institution building aims.

This report is a summary of the activities and accomplishments of the PERL during 1997, its third year of operation. We begin by presenting the research, training, and institution building aims that motivated these activities. We then go on to describe the specific research, training, and institution building activities that took place during 1997.



### ***Research Aims:***

- 1) To assess the influence of rapid changes in the ecological context on population processes, with a special emphasis on the processes of family formation, since these processes are a major determinant of population growth.
- 2) To assess the influence of changing demographic parameters, particularly related to population growth, on the ecological context.

### ***Teaching Aims:***

- 1) To train Nepalese applied social scientists in state-of-the-art social science research methods.
- 2) To train US social science students in research methods appropriate for developing country contexts.

### ***Institutional Aims:***

- 1) To create and institutionalize technical infrastructure for ongoing social science and demographic research in Nepal, including computing facilities and a survey research staff.
- 2) To develop a strong institutional link between IAAS and PRI that will be the basis for cooperative research projects and training of faculty and students at both sites.

## **RESEARCH**

During 1997 the research activities of the PERL once again revolved around two large scale, long term research projects. The first of those is titled "Changing Social Contexts and Family Formation" which is referred to in the field as the "Chitwan Valley Family Study". The second project is titled "Reciprocal Relations between Population and Environment" and this project builds directly from the Chitwan Valley Family Study. The study area for both projects is the western part of the Chitwan valley in south central Nepal. It is surrounded by

the Chitwan National Park (jungle) in the south, the Rapti River in the west, Nepal's East-West Highway in the east and by the Narayani River in the north. While both projects are funded initially for five years, the Chitwan Valley Family Study began in late 1994 and the Population and Environment study started officially in September of 1995.

*Chitwan Valley Family Study:* This study is designed to investigate the influence of changing social contexts on the timing of marriage, childbearing and contraceptive use. The research is aimed at answering the following specific questions: (1) To what extent do changes in the community-level social and institutional context produce changes in family formation processes? (2) Do changes in the family organization of individual life courses transmit these contextual effects? (3) Do any direct effects of contextual change remain once important individual-level experiences are taken into account? and (4) Do the consequences of community-level changes depend on the cultural context? This study used a combination of ethnographic and survey methods to gather neighborhood histories from 171 neighborhoods in Western Chitwan. The project also gathered personal histories from the 5271 individuals between the age of 15 and 59 years living in these neighborhoods.

The sample of neighborhoods for this study was chosen to represent the neighborhoods in Western Chitwan (equal probability), including the five major ethnic divisions inhabiting the area. These ethnic divisions include high caste Hindus, hill Tibeto-Burmese (such as Gurung, Tamang and Magar), indigenous terai Tibeto-Burmese (such as Tharu, Derai, and Kumal), Newar, and low caste Hindus. Considering the importance of dramatic social and economic changes in Narayanghat (the only city in the valley, on the edge of the study site), the sample was stratified by distance from this town.

By the end of 1997, PERL staff had completed the collection of neighborhood histories from all 171 neighborhoods in the sample. We had completed the collection of histories from all the schools, health facilities, transportation facilities, banks, development projects, temples, women's groups, agricultural cooperatives and other public facilities in the study area as well.



The first half of 1997 was devoted to completion of the individual-level interviews, including the collection of a Life History Calendar. We completed 5271 individual interviews, successfully interviewing over 98% of the adult residents of these neighborhoods and their spouses. Each questionnaire was then checked for completeness and accuracy by three different supervisors before being passed on to the data entry staff. Using a special computer program designed by Jeanne Spicer (PRI), PERL data entry staff also successfully *double* entered all 5271 of these individual interviews into computerized form. That is 10,542 separate entry jobs. The final data have been transferred to Penn State, where they continue to be checked and cleaned. We hope to have file construction complete by the end of 1998 and release these data to the public in 1999.

***Reciprocal Relations Between Population and Environment:*** This study is designed to answer the following specific questions regarding the relationships between population change and environmental change: (1) To what extent do changes in marriage timing, household fission, childbearing, and migration influence changes in land use, water quality, and flora diversity? (2) To what extent do variations in land use, water quality, and flora diversity produce changes in marriage timing, household fission, childbearing, and migration? And (3) To what extent are the observed relationships between population processes and the environment produced by exogenous changes in the social and institutional context?

This study builds on the Chitwan Valley Family Study (CVFS) by using the same study population and sampling frame. This feature allows the Population and Environment study to use data on socioeconomic change and demographic history collected in the CVFS. The Population and Environment study is designed to add several new components to this database. These include land use maps of the areas surrounding the neighborhoods, flora diversity counts from surrounding forests and pasture land, lab analyses of water samples collected from the neighborhoods, a monthly update of demographic events (for three years), and a seasonal update of agricultural activities (also for three years).

We used 1992 aerial maps scaling 1:25,000 of Western Chitwan to select sites for flora counts and obtained permission from the Department of Parks and Wild Life and the Department of Forestry to take flora counts in the National Park area and the district forest area. We conducted land use mapping by delineating boundaries of the neighborhoods and measuring the land area of each neighborhood by land use type (e.g., cultivated land: upland, perennial and seasonally irrigated land; household and kitchen garden yards; plantations and orchards; common land and pastures; roadways). We also selected drinking water sampling points. The first round of these aspects of our environmental data collection were completed in early 1996. These measures will be repeated in early 1999.



*Environmental Measures.* We conducted our baseline environmental data collection in the Spring of 1996. Mapping of land use patterns within neighborhoods began with the delineation of neighborhood boundaries so that each piece of land in Chitwan was assigned to a specific neighborhood giving it one, and only one chance of falling into our sample. We identified 18 mutually exclusive land uses within neighborhoods. Within neighborhood boundaries we mapped each separate type of land use with tape measures and compasses. These measurements were then entered into a Geographic Information System (GIS) to calculate the land area associated with each use. The resulting data were then merged with the CVFS data.

We used 1992 aerial maps of Western Chitwan scaling 1:25,000 to select sites for flora counts from the Chitwan National Park area and other forested areas surrounding Chitwan. We selected a total of 127 plots, at various depths within the forest, from these forested areas. Dr. Dharma Raj Dongol (Botany, IAAS) trained a team of field workers to identify collect flora species. With the cooperation and assistance of the Department of Parks and Wildlife and the Department of Forestry we visited each plot to count all flora species. We also selected an additional 138 plots from common land within Chitwan, surrounding our selected neighborhoods. Data on the number and type of species on each plot have been entered into computerized form and samples of the flora species have been preserved in an herbarium at the IAAS. In 1997 we collected the exact latitude and longitude of each plot with the aid of Global Positioning System (GPS) technology. PERL staff also completed the computer entry of these flora data in 1997 and began the data cleaning process. We expect the flora data to be ready for analysis in 1998.

We also selected drinking water samples from each of the neighborhoods included in our study. All of the neighborhoods in our study obtain drinking water from shallow wells. A team of IAAS researchers, led by Dr. Madhav Shrestha, analyzed the chemical content of samples of well water from each neighborhood. These analyses





included suspended solid particles, dissolved solids, specific conductivity, chemical oxygen demand, pH levels, inorganic nitrogen content, and phosphorous content. Water samples from a total of 199 wells were included in these analyses. In addition, we collected a variety of information about the wells themselves, including the well depth, the well covering, and the nature of the area surrounding the well. We also measured the chemical content of 86 water samples from irrigation systems serving our study area.

Each of these environmental quality measures will be repeated in early 2000.

***Agricultural Measures.*** In 1996 we began our baseline survey of agricultural activities. By early 1997 we had completed interviews of all 1802 households in the neighborhoods sampled for our study. The high response rates we have experienced throughout our field work, 100 percent in this case, reflect the general cooperative nature of the

Nepalese residing in Chitwan and the highly localized nature of our study design, as well as the efforts of the survey research staff. The interview was designed to measure use of natural resources, particularly forest products, as well as farming practices, including cropping patterns, animal husbandry, use of chemical fertilizers and pesticides, and use of mechanization and irrigation. Using another special program designed by Jeanne Spicer (PRI), the data from these 60 minute interviews was double entered into computerized form and transferred to the Population Research Institute. Data cleaning and codebook preparations continued there throughout the remainder of 1997, and we expect these activities to be completed in 1998. The baseline agricultural data should be ready for release to the public by 1999.

In January of 1997 PERL staff launched our seasonal update of agricultural activities. This 15 minute interview is conducted at every household in the study area once every four months and is scheduled to continue through January 2000. It provides continuous tracking of cropping patterns and related agricultural practices. During 1997 we completed three rounds of this seasonal agricultural survey maintaining a response rate of more than 98 percent. Data entry for the first year of these data will take place in 1998 and we expect the data to be ready to use by late 1999.

***Registry of Demographic Events.*** In February of 1997 PERL also launched our household registry: a survey designed to collect monthly updates of demographic events from those living in our sampled neighborhoods. This data collection is designed to monitor births, deaths, marriages, divorces, household fissions, in-migration, out-migration, and contraceptive use among all those living in our study area from February 1997 through February 2000. The sample for this household registry is every household included in the CVFS (described above), and we follow these household even if they move away from Chitwan Valley. PERL staff put a great deal of effort into tracking these households, traveling throughout the country by bus or on motorcycle to maintain contact with study participants wherever they may move. As a result, during 1997 we completed 11 rounds of this survey, maintaining a response rate of more than 98 percent.

The data from this household registry constitute not only a monthly record of demographic events, but because they can be linked to other CVFS data, they also constitute a panel study of the Chitwan population. Computer entry for the first six months of these data was completed in 1997 and data cleaning and codebook preparation are scheduled for 1998. We expect the first year of these data will be ready for use in late 1999.



## TRAINING

Several training activities were conducted during the year: (1) refresher and study-specific training for survey research supervisors, interviewers, and data entry staff; (2) methodological training for PERL faculty associates and supervisors; (3) training toward advanced degrees for PERL staff. Below we provide a brief description of the training conducted during the year.

**Training of survey research supervisors, interviewers, and data entry staff:** Although the PERL survey staff had extensive training in 1996 and a great deal of experience by the beginning of 1997, we conducted period refresher training courses throughout 1997. The training was conducted through a series of lectures, practical field training exercises, and questionnaire pre-tests. Written training materials were based on the Survey Research Center of the University of Michigan interviewer training and supervision protocols. In addition to these general training exercises, PERL also conducted study-specific training for the seasonal agricultural survey and the demographic events registry. Separate study-specific training was conducted for supervisors, interviewers, and data entry staff.

**Methodological Training.** In addition to the methodological training which takes place at PERL, key PERL staff had the opportunity to participate in two special training programs organized in Nepal by the University of Michigan during 1997. Prem Bhandari, PERL junior faculty associate and project coordinator, attended a one week workshop on methods for area sampling conducted by Professor Jim Lepkowski of the University of Michigan. Indra Chaudhary and Sujana Shrestha, both PERL field supervisors, attended a one week workshop on ethnographic methods conducted by Professor Tom Fricke of the University of Michigan. These types of ongoing training help PERL staff continue to employ state of the art methods in their field work.

Students in the Ph.D. program at Penn State University also travel to PERL for training in survey research and ethnographic methods. PERL provides a unique opportunity for Penn State Ph.D. students to become directly engaged in a large scale international research project. During 1997 two students, Lisa Pearce and Scott Yabiku, traveled to PERL for this purpose. Each spent several weeks living in Chitwan, working on PERL studies that were in the field at the time, and conducting their own independent research.



### *Other PERL Training Initiatives*

To facilitate the academic development of PERL junior faculty associates and senior research staff, PERL continues to conduct training exercises aimed at improving the staff's basic skills in English and mathematics and raising staff scores on standardized exams such as the GRE and TOEFL. The main aim of these activities is to place PERL staff in social science degree programs outside Nepal. PERL has enjoyed some success with this process. In January of 1996 Kishor Gajurel (PERL junior faculty associate) began the Ph.D. program in Rural Sociology and Demography at Penn State. In January of 1997 Purandhar Dhital (PERL junior faculty associate) began the Ph.D. program in Agricultural and Extension Education with a Demography minor at Penn State. In the fall of 1997 Dirgha Ghimire (PERL study coordinator) began the Ph.D. program in the Sociology and Demography at Penn State. Also in the fall of 1997, Netra Chhetri (PERL study coordinator) began the Ph.D. program in Geography with a minor in Demography at Penn State. All four of these PERL staff members plan to return to Nepal at the completion of their degree programs to continue their research careers at PERL.

## INSTITUTION BUILDING

Institution building activities at the PERL have focused on developing research infrastructure at the IAAS in Nepal and forging stronger links between IAAS and PRI. In 1995 the development of PERL research infrastructure began with investment in two research support groups: (1) the Survey Research Support Group, and (2) the Computing Support Group. The PERL physical infrastructure are housed in two IAAS buildings, one for the survey research support group and a second for the computing support group. This second building also houses the living quarters for visiting PERL staff and students. PERL infrastructure development began with the acquisition of basic furnishings, including tables, chairs, desks, storage cabinets, bookshelves and filing cabinets. The development of these infrastructure has continued throughout 1996 and 1997, including increasing the staff, enhancing the computing facilities, and improving the office environment.

*Survey Research Support Group.* In 1997 this PERL support group employed two IAAS faculty associates, two coordinators (one for each research project), two head supervisors, six interviewer team supervisors, and forty-two interviewers. All of these staff received training in survey research and related research methods (described above). The staff is trained in the collection of household census data, household-level agricultural and economic data, individual life history data (using a life history calendar), data on the attitudes, beliefs, and preferences of individuals, and various other types of household and individual data. The staff is experienced in a variety of survey research activities, including questionnaire design, pre-testing of instruments, household-level interviewing and individual-level interviewing. PERL survey research procedures include an extremely high level of supervision, monitoring, and quality control. For example, each team of seven interviewers is accompanied by a supervisor at all times while in the field and each completed questionnaire is checked by at least three supervisors before it is released for coding. This staff now has extensive training and experience fielding multiple types of household and individual surveys. A central aim of the PERL institution building objectives is to maintain the availability of this staff for fielding new surveys in Nepal.



**Computing Support Group.** The PERL computing facility consists of five desktop computers, three laptop computers, and one ink jet printer along with a large array of supporting equipment. Due to the problems of severe heat and excessive moisture during the monsoon, and frequent power outages, the laboratory is furnished with an air conditioner, an electrical generator, two uninterrupted power supply sources, and several voltage stabilizers. Besides these facilities, the IAAS's Rural Resources Studies Program (PERL's parent institution) maintains a modest GIS laboratory with two computers, one laser jet printer, one dot matrix printer, a 54 color combination printer, two hand held roving GPS devices, and a digitizing pad. Although the computing staff's main expertise is in the area of computerized data entry, the staff has also developed expertise in both English and Nepalese word processing and some expertise in data management, particularly the use of spreadsheets.





By the end of 1997, this staff had conducted more than 15,000 data entries. These included more than 10,000 entries of a 110 page questionnaire and a 59-year life history calendar. Thus, this data entry reflects the accomplishment of an immense task. The staff are highly skilled in editing, coding, data entry, double-entry, and data checking. All data are double entered and checked for discrepancies at PERL, so that entry problems can be resolved in the field. During 1998 we expect to double enter approximately 5000 seasonal agriculture update questionnaires and approximately 3600 household registry forms. Thus this data entry staff is well practiced and PERL has the capacity to perform very large data entry operations.

Overall our goal is to create a data entry and computing resource designed to support continued large scale social science research projects in Nepal. Our investments in both equipment and staff training were designed to meet this aim. In 1998 we also expect to develop staff with strong data management and analysis skills so that the PERL computing support group will be ready to serve new large scale social science research projects.

*Other PERL Infrastructure.* In addition to these research support groups, the nature of the lab's research and training agenda required the development of other support facilities. PERL maintains two motorcycles, two scooters, and more than 40 bicycles. This transportation infrastructure provides the means for travel to field sites to complete data collection activities in a timely manner. The PERL also operates a small guest house with three guest rooms, a bathroom and a kitchen. These facilities provide housing for Penn State students studying at the PERL, as well as visiting PERL staff. Finally, PERL maintains a small library of study materials related to population, the environment, and social science research methods.



The Population Research Institute (PRI) at Penn State University also provides a wide range of infrastructure support to PERL. This includes assistance of the support staff from all the PRI research support cores. In particular, Cassie Johnstonbaugh (PRI administrative core) provides administrative services for all aspects of the PERL research and training activities. Likewise, Jeanne Spicer (PRI computing core) provides computing services to PERL, including the design of all data entry systems and oversight of data cleaning and management activities

*Exchange Visits.* One of the keys to developing stronger research and training links between the IAAS (Tribhuvan University, Nepal) and the PRI (Penn State University, USA) has been a series of exchange visits. The visits are aimed at promoting stronger collaborative ties between IAAS and PRI and promoting new PERL related research or training initiatives. To meet this aim exchange visits were organized around ongoing PERL activities.

The following visitors and research collaborators visited PERL during 1997:

Lisa Pearce, (Sociology) of the Population Research Institute, Penn State University spent five weeks in Nepal engaged in various PERL research and training activities. Her research work involved supervising interviewer and data entry staff, checking completed interviews, and designing coding systems for open ended questions. Her training efforts included English language training for PERL faculty and supervisors, as well as skill development training for support staff. She also conducted her own independent ethnographic research on religious beliefs and practices and their relationship to fertility behavior.

Scott Yabiku, (Sociology) of the Population Research Institute, Penn State University spent four weeks in Nepal engaged in various PERL research and training activities. His research work involved installation of new data entry software, advising on demographic event registry protocols, refusal conversion, and development of staff policies. His training efforts included English language training for PERL staff and training of data entry staff in the use of the new entry software. He also conducted his own independent ethnographic research on media exposure and the spread of Western culture.

Dr. Tom Fricke, (Anthropology) of the Population Studies Center and the Institute for Social Research, the University of Michigan, visited PERL for one week to oversee research activities and to advise the data collection staff. Dr. Fricke also worked with PERL staff to plan future research and training activities.

Dr. Ganesh Shivakoti, (Agricultural Economics) of the Institute of Agriculture and Animal Science, Tribhuvan University, spent four weeks at the Population Research Institute at Penn State. Dr. Shivakoti worked with Penn State faculty and staff on data cleaning, codebook creation, the design of new coding schemes, and the preparation of research papers. He also worked with faculty at PRI to plan new research and training activities.

## FINANCIAL SUPPORT

Financial support for PERL activities during 1997 came from a number of different sources. Below we provide a brief summary of those sources and the activities they support. Without financial resources from these groups, the PERL's accomplishments in 1997 would not have been possible.

**Research Support.** Financial support for PERL research projects came from the National Institute of Child Health and Human Development (NICHD) of the National Institutes of Health and the National Science Foundation (NSF), both of the USA. Specifically:

- The Chitwan Valley Family Study is funded by NICHD under a grant entitled "Changing Social Contexts and Family Formation" (grant # R01-HD32912), William G. Axinn, principal investigator.
- The Population and Environment Study is funded by NICHD under a grant entitled "Reciprocal Relations between Population and Environment" (grant # R01-HD33551), William G. Axinn, principal investigator.
- Additional support for these ongoing research activities is provided by a grant from the NSF entitled "NSF Young Investigator Award" (grant # SES-9257724), William G. Axinn, principal investigator.

**Training Support.** Financial support for PERL training activities came from the Population Research Institute (PRI) of Penn State via institutional grants from the Andrew W. Mellon Foundation and the William and Flora Hewlett Foundation, from various academic units at Penn State, and from the NSF. Specifically:

- Support for Penn State Ph.D. students (from the USA) participating in PERL training activities in Nepal came from the PRI's Andrew W. Mellon Foundation grant entitled "International Demographic Research and Training for the 1990's", William G. Axinn, principal investigator.

- Support for Penn State Ph.D. students (from developing countries) participating in PERL training activities in Nepal and the USA came from the PRI's William and Flora Hewlett Foundation Grant entitled "International Population Training and Collaborative Research", Gordon DeJong, principal investigator.
- Tuition and stipend support for Penn State Ph.D. students participating in PERL training activities in Nepal came from Penn State University's College of Liberal Arts, Department of Sociology, and Department of Rural Sociology.
- Additional support for these ongoing training activities came from matching funds generated by a grant from the NSF entitled "NSF Young Investigator Award" (grant # SES-9257724), William G. Axinn, principal investigator.

***Institution Building Support.*** Financial support for PERL institution building activities, including both infrastructure development and travel for exchange visits, also came from PRI institutional grants from the Mellon foundation as well as matching funds from the NSF. Specifically:

- Support for PERL infrastructure development and exchange visits by Penn State staff (USA) to the PERL came from the PRI's Andrew W. Mellon Foundation grant "International Demographic Research and Training for the 1990's", William G. Axinn, principal investigator
- Support for exchange visits by Nepalese PERL staff to Penn State came from the PRI's William and Flora Hewlett Foundation Grant entitled "International Population Training and Collaborative Research", Gordon DeJong, principal investigator.
- Support for infrastructure development and exchange visit travel came from matching funds generated by a grant from the NSF entitled "NSF Young Investigator Award" (grant # SES-9257724), William G. Axinn, principal investigator.

## 1997 PERL PAPERS AND RESEARCH REPORTS

Although PERL has only been operating for three years, by the end of 1997 PERL staff completed several papers based on PERL research projects. They are listed below.

- Axinn, William G., Jennifer Barber, and Dirgha J. Ghimire. 1997. "The Neighborhood History Calendar: A Data Collection Method Designed for Dynamic Multilevel Modeling." Sociological Methodology 27:355-392.
- Axinn, William G. and Ganesh P. Shivakoti. 1997. "Demographic Issues and the Use of Natural Resources" Pp. 83-85 in Shivakoti et al. (eds.) People, Participation, and Sustainable Development: Understanding the Dynamics of Natural Resource Systems. Bloomington, Indiana and Rampur, Chitwan.
- Axinn, William G., Lisa Pearce, and Dirgha J. Ghimire. 1997. "Innovations in Life History Calendar Applications." Poster presented at the 1997 annual meetings of the Population Association of America, Washington D.C., March 27-29.
- Barber, Jennifer, William G. Axinn, Ganesh P. Shivakoti and Kishor Gajurel. 1997. "Sampling Strategies for Less Developed Countries: A Detailed Example from Rural Nepal." Nepal Population Journal 6(5):193-203.
- Matthews, Stephen A. 1997. "Methods of Incorporating Spatial and Temporal Effects in Research on the Interrelationships Between Population and Environment" Pp. 205-218 in Shivakoti et al. (eds.) People, Participation, and Sustainable Development: Understanding the Dynamics of Natural Resource Systems. Bloomington, Indiana and Rampur, Chitwan.
- Matthews, Stephen A. and Kishor Gajurel. 1998. "The Spatial and Temporal Variation in Family Planning Services in Western Chitwan, Nepal." Working Paper: Population Research Institute.

- Oladosu, Muyiwa. 1997. "The Role of Men in Household Decision Making, Reproduction and Family Planning: A Study of the Gurungs in Chitwan, Nepal." Poster presented at the 1997 annual meetings of the Population Association of America, Washington D.C., March 27-29.
- Richter, Kerry and Netra Chhetri. 1997. "Issues and Strategies for Understanding Population and Ecology Interlinkages in Western Chitwan" Pp. 114-125 in Shivakoti et al. (eds.) People, Participation, and Sustainable Development: Understanding the Dynamics of Natural Resource Systems. Bloomington, Indiana and Rampur, Chitwan.
- Shivakoti, Ganesh P., William G. Axinn, Prem Bhandari, and Netra B. Chhetri. Forthcoming. "The Impact of Community Context on Land Use in an Agricultural Setting." Population and Environment.
- Shivakoti, Ganesh P., Stephen A. Matthews and Netra B. Chhetri. 1998. "Anthropogenic Impacts on Flora Biodiversity in the Forests and Common Land of Nepal." Paper presented at the 1998 annual meetings of the Population Association of America, Chicago, Il., April 1-4.



## **The Institute of Agriculture and Animal Science**

The Institute of Agriculture and Animal Science (IAAS) started as a School of Agriculture in 1957 under the Department of Agriculture of the Government of Nepal, and was elevated to the status of Institute of Agriculture and Animal Science, and became a part of the Tribhuvan University system. The central campus of the Institute is located at Rampur in the Chitwan district about 225 kilometers southwest of the capital city of Kathmandu. The mission of IAAS is to promote research and development in agriculture and to train students to support, implement and maintain agricultural development.

The academic programs at IAAS include a Bachelor of Science in Agriculture and a Bachelor of Veterinary Science and Animal Husbandry. The Institute also offers Master's degrees in Agronomy and Plant Breeding, Agricultural Economics, Animal Science, Horticulture, Entomology and Pathology. The programs are conducted through a total of thirteen departments and a core of 120 faculty.

The research activities of IAAS are coordinated through the Directorate of Research responsible for the formulation and execution of policies, and monitoring of faculty and student research. The faculty at IAAS have organized several research groups to take up interdisciplinary research and studies. Rural Resources Studies Program (R-RESP) is one of them and its mission is to continue the advancement of social science research and extension activities at IAAS in the areas of rural, natural and human resources. The two areas in which R-RESP is involved are: (1) Population and Ecology Research Laboratory (PERL) and (2) Rural Resource Information Laboratory (RRIL).

## The Population Research Institute

The Population Research Institute provides an organizational setting for interdisciplinary population research and training. The Institute includes more than forty faculty associates and about fifty graduate students from eleven different departments in the social and agricultural sciences and in health-related fields.

Population training at Penn State includes both pre- and postdoctoral training programs. Pre-doctoral training is provided through a multi disciplinary dual-title graduate program in demography. This unique program allows students to earn a dual-title master's or doctoral degree in demography and one of the following fields: sociology, economics, anthropology, agricultural economics, rural sociology, or human development and family studies. The program enables students to develop expertise and skills in demographic theory, methodologies, and policy analysis while maintaining a professional identification with their social science disciplines. Support for Predoctoral students is provided by the Hewlett, Ford and Mellon Foundations, the National Institute on Aging (NIA), the National Science Foundation (NSF), and research and teaching assistantships in affiliated departments.

Postdoctoral training in the Population Research Institute is oriented toward refining demographic research skills through collaborative apprenticeships in research in population biology, intergenerational relations, and cohort succession in aging populations. This NIA funded training program supports four postdoctoral fellows each year. Postdoctoral training at the Institute also focuses on international demography, particularly fertility in developing countries and methods for combining qualitative and quantitative research strategies. This aspect of the training program is funded by the Mellon Foundation. Postdoctoral support also is available through the Mellon Foundation's fellowship program in anthropological demography, and PRI has hosted several postdocs in this area.

The Population Research Institute provides research support services and facilities to PRI associates and affiliates and pre-and postdoctoral trainees. Research support activities are provided in five main areas: administration, computer facilities and programming,

statistical consulting, information access and retrieval, and geographic information analysis. These services are funded through a combination of Penn State support, core grants from the National Institute of Child Health and Human Development and National Institute on Aging, and private foundations such as Hewlett and Mellon. The PRI is the institutional home of the Center on Aging and Health in Rural America (CAHRA) and the Population and Ecology Research Laboratory (PERL).

