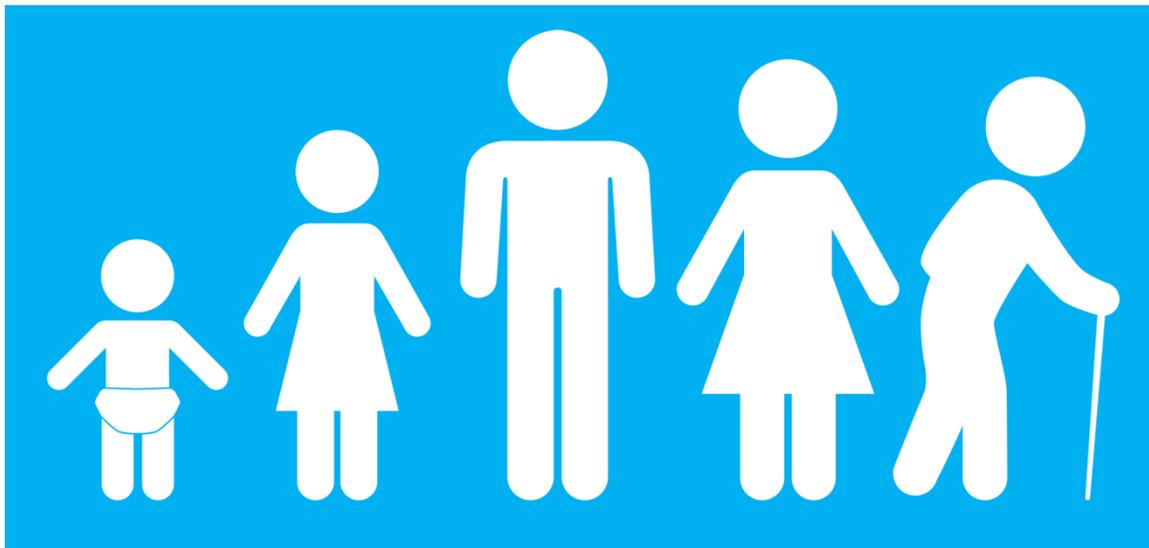


# Chitwan Valley Family Study (CVFS)

Data Summary



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## Public and Restricted Data List

Currently available through ICPSR ([www.icpsr.umich.edu](http://www.icpsr.umich.edu)):

	Public Data	Restricted Data
DS1 & DS2: Baseline Agriculture and Consumption Data Time 1 (1996)	x	x
DS3 & DS4: Individual-Level Household Census Data Time 1 (1996)	x	x
DS5: Child-Level Data (Individual Interview) Time 1 (1996)	x	
DS6 & DS7: Family Planning Data (Months 1-54)	x	x
DS8: Healthpost History Data Time 1 (1996)		x
DS9 & DS10: Household Registry Data (Months 1-54)	x	x
DS11 & DS12: Individual Interview Data Time 1 (1996)	x	x
DS13: Individual Life History Calendar Data Time 1 (1996)	x	
DS14: Neighborhood History Data Time 1 (1996)		x
DS15 & DS16: Household Relationship Grid Time 1 (1996)	x	x
DS17: School History Data Time 1 (1996)		x
DS18: Agriculture and Consumption Data Time 2 (2001)		x
DS19: Agriculture and Consumption Data Time 3 (2006)		x
DS20: Land Use Data Times 1-3 (1996, 2001, 2006)		x
DS21: Household Registry Away Data (Months 1-36)		x
DS22: Neighborhood History Data Time 2 (2006)		x
DS23: School History Data Time 2 (2006)		x
DS24: Healthpost History Data Time 2 (2006)		x
DS25 & DS26: Household Registry Data (Months 1-126)	x	x
DS27: Individual Interview Data Time 2 (2008)		x
DS28: Individual Life History Calendar Data Time 2 (2008)	x	
DS29: 1996 and 2008 Panel Data Combination (Individual Level)		x
DS30: Flora Survey Data Times 1-3 (1996, 2001, 2006)		x
DS31: Neighborhood Distances File		x

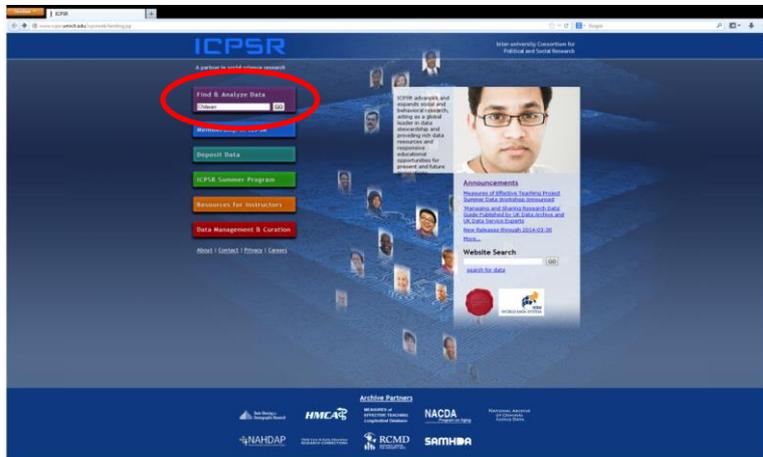
Currently ready for analysis and available soon through ICPSR:

Elderly Health and Wellbeing Survey (2006)	Individual Marital Supplement (2006-2008)
Neighborhood Relationship Grid (2002)	Marital Dynamics Survey (2004)
Perspective Panel Data on Ideational Factors (2009-2012)	Armed Conflict Family Change and Mental Health (2009)
Arsenic and Groundwater Quality Test (2004)	Community Forestry and Tiger Tolerance Survey (2008)
Armed Conflict, Family Change, and Mental Health (2008)	Camera Trapping (2010-2011)
Developmental Idealism and Family Dynamics Study (2003)	Religious Life Study (2007)
Family Planning Data Months 1-192	Tourist Arrival Data
Menstruation and Education (2006)	Water Quality (1997)
Seasonal Agriculture Survey (1997-1999)	Weather Data
HIV/AIDS and Later Life Health and Wellbeing (2009)	Divorce Data
Household Registry Data Months 1-192	Climate Change, Vulnerability, and Adaptation Survey (2010)
Household Census Time 2 (2008)	Household Diversification and Migration (2013)
Household Relationship Grid Time 2 (2002)	Coupled Nature Human (CNH): Invasive Species Data (2013)
Biomass Mapping (Fuelwood Use Survey) of Chitwan (2009)	Modular Design Approach to Survey Data Collection (2013)
Household Relationship Grid Time 3 (2008)	Measurement of Marital Interactions and Relationship Dynamics (2013)
Nepali Migrants to Gulf Cooperation Council (GCC) Countries (2009-2010)	Measurement of Remittance Use (2013)
Innovative Methods for Obtaining Survey Data from Migrants (2011-2012)	

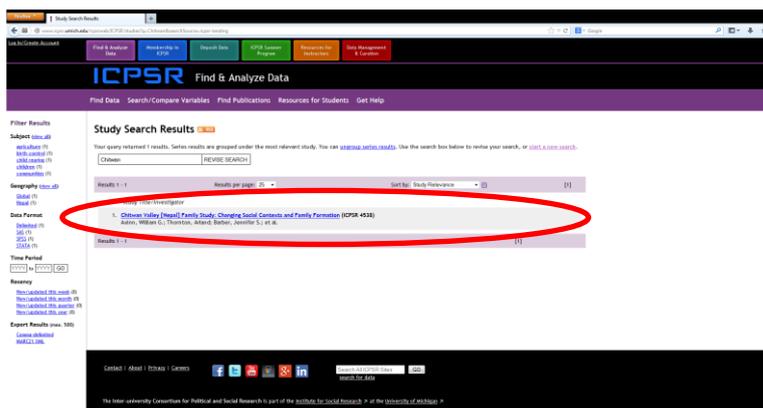
## How to Download Chitwan Valley Family Study (CVFS) Data?

### Chitwan Valley Family Study (CVFS) Data Access Instructions

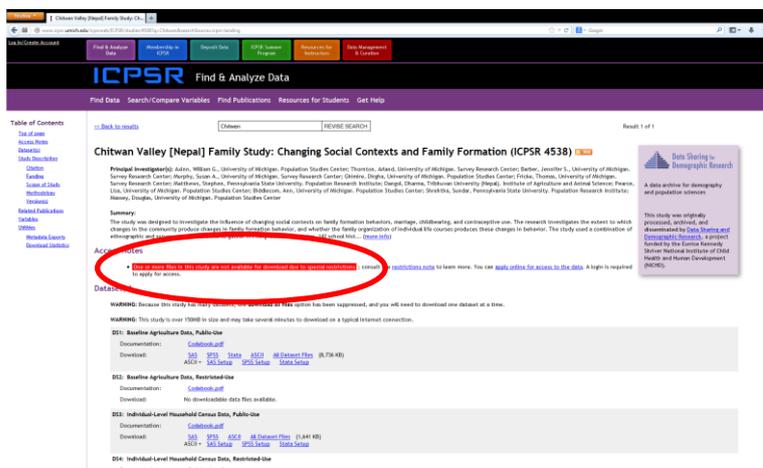
1. Go to [www.icpsr.umich.edu](http://www.icpsr.umich.edu)
2. Type “Chitwan” under “Find & Analyze Data” and click “Go”



3. Click on “Chitwan Valley [Nepal] Family Study: Changing Social...”



4. Click on the file you wish to download under “Dataset(s)”



## Neighborhood-Level Data

**Neighborhood History Data.** In order to collect detailed neighborhood histories, we developed an innovative new procedure we call the Neighborhood History Calendar. This procedure is described in detail in a paper by Axinn, Barber, and Ghimire (1997) published in *Sociological Methodology*. The key innovations include: (1) an explicit integration of archival, ethnographic, and survey methods; (2) the creation of timing cues to assist recall of the timing of neighborhood-specific events potentially difficult to remember; (3) the development of a standardized recording device (the calendar and accompanying questionnaire) to create uniform measurement across all neighborhoods; and (4) a multiple interview, multiple respondent strategy to maximize discovery of relevant changes.

In 1995, the neighborhood history calendars were administered in 171 sample neighborhoods to record the history for the prior fifty years of neighborhood access to electricity, schools, health services, bus services, grain mills, agricultural cooperatives, dairies, markets, banks, employment opportunities, small farmers' development programs, women's groups, youth groups, temples, and police stations in each neighborhood. For services such as schools and banks, the opening date for the nearest facility, the date for the nearest facility before that one opened, and the beginning date for the nearest facility before that, were recorded on the calendar. The precise timing of these events was established by reconciling the reports of several respondents with government and other independent records of events (Chayovan and Knodel 1985). Direct observation served as additional confirmation that the event in question had occurred. Additional information about each service that could not be easily recorded on the calendar (e.g., time to reach by bus and by foot) was recorded in an accompanying questionnaire. Ethnographic techniques were also used to discover neighborhood changes of which the investigators could not be aware before entering the field. These ethnographic methods were successful in measuring highly localized events and programs with important consequences for family formation behavior that could not have been anticipated before the beginning of the data collection (Axinn 1992; Axinn, Fricke, and Thornton 1991). Global positioning system equipment was also used to gather the latitude and longitude of each neighborhood.

To provide continuous measures of neighborhood characteristics, the neighborhood histories were updated in 2006. This data collection was performed using exactly the same methods and procedures as the previous neighborhood history data collection, with some additional attention to achieving continuity between the end of the previous calendar (July-December 1995) and the beginning of this new calendar. The procedure is designed to produce a continuous record of neighborhood contextual changes through 2006. It also measures a small number of new organizations that have come to the setting since 1995, such as internet access centers (and cafes). These neighborhood history calendar data are available through the Interuniversity Consortium for Political and Social Research (ICPSR) at [www.icpsr.umich.edu](http://www.icpsr.umich.edu).

**Other Histories.** Although neighborhood residents were able to provide high quality information about their access to various types of nearby services, they were less able to provide reliable details about those services. Therefore, special calendars were designed to collect data directly from schools, health services, banks, government programs, and bus (transportation) routes (Axinn, Barber, and Ghimire 1997). We describe the school, and the health service history data collection below. These data are available through the ICPSR at [www.icpsr.umich.edu](http://www.icpsr.umich.edu).

**School History Data.** Regional and government records, interviews with residents, and interviews with former school employees were used to list every

school in Chitwan, including schools that had closed by the time of data collection. School histories were then collected from every school that had ever been located in the valley, even if it was no longer in operation. Measures were drawn from a combination of school records, interviews with school administrators, and interviews with teachers. For older schools in which none of the current staff knew the early history of the school, or schools that were no longer open, former administrators and teachers were located and interviewed in their homes. The following information was recorded annually on school history calendar: highest and lowest grade available, number of classrooms, number of students, number of female students, tuition for grades 1 and 10, other fees for grades 1 and 10, type of curriculum, curriculum on family planning, number of students in dormitory, number of female students in dormitory, number of teachers, number of teachers with Bachelor's degrees, number of female teachers, and the medium of instruction (English or Nepali). Additional information, such as the school location, the date the school opened, and the funding source to open the school, was recorded on a companion questionnaire. We also used global positioning system equipment to gather the latitude and longitude of each school. Initially, data were gathered for 145 schools for the prior fifty years. Similar to the neighborhood history calendar, we updated the school history data collection in 2006 for 155 schools. Based on lessons learned from our ongoing ethnographic field work, we modified our original school history instrument by adding a number of new attributes and facilities. These are now cross checked for discrepancies, cleaned and merged with previous waves of data.

**Health Post History Data.** We followed a similar procedure to collect histories of all the health services in the study area. We began by using regional government records and interviews with local residents to create a list of every health service that had ever operated within the study area, regardless of whether it was still operating at the time of the study. Health services included hospitals, clinics, dispensaries, and pharmacies. Such a broad definition was necessary to include all facilities providing any type of contraceptive method. As with the school history calendars, data were collected from the records of each health service, interviews with managers, and interviews with workers. When current workers or managers were not available, or their knowledge was insufficient, we found former employees and interviewed them in their homes. The following information was recorded annually on a health service history calendar: years operating, number of days of service per week, number of hours of service per day, number of staff (doctors, nurses, and health workers), number of rooms and related facilities (examination tables and inpatient beds), contraceptive methods available (pills, IUD and loop, Depo-Provera, condom, foam, laproscopy, vasectomy), costs of each contraceptive method, association with mobile sterilization camps, other family planning programs or services offered, and other maternal and child health programs or services offered (birthing, child vaccinations, diarrhea treatments, nutritional programs, and prenatal care). Other information was recorded on the accompanying questionnaire. We also used global positioning system equipment to gather the latitude and longitude of each health service center. In 1996, we gathered data for 113 health services for the prior fifty years. To provide continuous measures of health service characteristics, we updated the health service history data collection in 2006 for 212 health services. In order to provide dynamic measures of health service, based on lessons learned from our ongoing ethnographic field work, we modified our original health service history instrument by adding a number of new attributes and facilities. These data are now cross checked for discrepancies, cleaned and merged with previous waves of data.

**Neighborhood Relationship Grid.** To facilitate analyses of the influence of related and non-related neighbors on individual behavior, information on neighbors'

relationships to each other was collected. A simple form was devised to record all households in the neighborhood and whether each household is related (by blood or marriage) to any of the other households. This complete relationship enumeration allows us to determine the network of relationships within the neighborhood from the independent perspective of each household. This information was collected in 2002 and has been used in analyses of the impact of neighbors' experiences and attitudes on individuals' family formation behaviors (Ghimire 2004).

### Household-Level Data

We began survey measurement in 1996 with a household-level survey administered to all 1,805 households in the sampled 171 neighborhoods. We allowed any household member to act as an informant and encouraged multiple household members to participate in the interview. The survey consisted of two types of information: a) census; and b) within-household relationship grid.

**Household Census and Relationship Grid.** The census form listed all the members of the household who ate and slept in the household for more than half the time during the previous six months. This list was supplemented by anyone who was married to someone on the initial list. Once the household listing was complete, it was used to record the relationships among all household members as of the interview date in 1996. This relationship grid measured the relationships of each household member to every other household member (parent, child, sibling, spouse, or other). This complete relationship enumeration has important advantages over more typical measures of relationships to the "household head" – it allows the use of spousal, parental, and sibling characteristics in models of individual behavior. The Time 1 data are available through the ICPSR at [www.icpsr.umich.edu](http://www.icpsr.umich.edu).

In 2002, the within household relationship registry was updated in 151 of the original sample neighborhoods. Due to budget constraints, updates could not be obtained from all 171 of the original neighborhoods. New members of the original households were added and relationship information was collected for new households that joined our monthly demographic event registry.

In 2008, we repeated the household census and household relationship registry in all 151 neighborhoods for the third time. This was done to add new members of the original households and to add relationship information for households that joined our monthly demographic event registry. The Time 2 and 3 data will soon be available through the ICPSR at [www.icpsr.umich.edu](http://www.icpsr.umich.edu).

**Agriculture and Consumption Survey.** In 1996, the household agriculture and consumption survey was administered to gather information about farming (e.g., farming versus non-farming household, land holdings, farming practices); livestock (e.g., number, management, feeding practices); household possessions (radio, television, motorcycle, tractor, and when each item was first owned); members living away from home; perceptions of environmental change; insects, pests, and diseases; and housing quality.

To measure changes in household agriculture practices and consumption, this household-level survey was repeated in 2001. This included 2,037 households, and achieved a response rate of 98 percent of eligible households. The 2001 survey included all content from the 1996 survey, plus new questions designed to measure income, assets and consumption. In 2006 this survey was repeated for a third time, with substantial new measures of exit from farming and resource use. This data include information from 2,361 households, and achieved a response rate of 97.8 percent of the eligible households. All the data are available through the ICPSR at [www.icpsr.umich.edu](http://www.icpsr.umich.edu).

**Seasonal Agriculture Survey.** The survey collected the seasonal agriculture data from the households which were interviewed for baseline agriculture

in 151 neighborhoods. This survey begins in January 1997 and ends in April 1999. Since, three crops are taken in one agricultural year in Chitwan valley, the survey classified one agricultural year into three seasons, i.e., one season consisting of four months. All the households, which were interviewed for previous agriculture survey and resided within the neighborhoods, were considered eligible for this survey. This survey collected information about yield/production, new crop or new cultivation and new land parcel and achieved response rate of 99.7 percent.

### **First Wave (1996) of Individual Survey Data**

All residents of the sampled neighborhoods between the ages of 15 and 59 and their spouses were surveyed. A "resident" was defined as someone who ate and slept in the household for more than half the time during the previous six months. Because this sample definition omitted some spouses who were away for extended periods, over age 59, or under age 15, this main sample was supplemented by interviewing all spouses of the main sample, regardless of age or residence. The individual-level survey included a questionnaire and life history calendar.

The individual-level interviews began in August, 1996. The interviews (life history calendar and questionnaire) were administered by five teams of five interviewers, with one supervisor for each team. More than 90 percent of the interviews were completed by March, 1997. The data collection period was extended until August, 1997 to interview respondents who could not be contacted earlier. This effort included locating and interviewing a small number of respondents who had moved between the time of the census and the time of our individual interviewing. A total of 5,271 men and women ages 15-59 and their spouses were interviewed, yielding a response rate of 97%. This overall response rate of 97% reflects a combination of a 99% response rate for our main sample and an 85% response rate for our spouse sample. Our spouse sample was defined as non-resident spouses of our neighborhood residents, with resident spouses 15-59 being part of the main sample. Overall, there were only a few refusals – most of the eligible respondents who were not interviewed were either out of the country throughout the data collection period or could not be tracked for other reasons. These Time 1 individual-level data are currently available through the ICPSR at [www.icpsr.umich.edu](http://www.icpsr.umich.edu).

**Individual Interview Data.** The questionnaire portion of the individual interview asked about respondents' communities of childhood residence, non-family experiences, religion and religiosity, marital and family relationships, social networks, and a broad array of attitudes toward marriage, contraception, and childbearing. These attitude measures were designed through a combination of unstructured ethnographic interviewing and repeated pre-testing. Five separate pre-tests of various attitude measures between 1993 and 1996 were conducted. The final measures include Coombs' scales of preferences for completed family size and the gender of children (Coombs 1974, 1979); preferences for education and non-family careers for children; ideal age at marriage for men and women; attitudes toward remaining single, remaining childless, and having large families; attitudes toward divorce, remarriage, and intermarriage; attitudes toward the gendered division of labor, premarital sex, and contraceptive use; and attitudes toward trade-offs between childbearing, old age care, and expectations of support from children. The questionnaire also included measures of respondents' perceptions of costs, side effects, and efficacy for each contraceptive method used in this part of Nepal.

**Individual Life History Calendar Data.** Information from the neighborhood history calendars was used to design the individual-level life history calendar. Interviewers used the life history calendar to record information about respondents' residence (migration), marital events (age at marriage, number of marriages, number of spouses, living arrangements with spouse(s), changes in

marital status), childbearing (dates of births, gender, children's education, living arrangements, children's deaths), contraceptive use (methods ever used, dates of first use), living arrangements (with parents, in-laws, other relatives, with housemates, in dormitories or barracks, alone), travel (within Nepal, outside Nepal), education, and employment.

To accommodate the broad age range of the study population and segments of the Nepalese population who do not use calendars to mark personal events, the life history calendar was designed by altering the overall structure as well as the types of timing cues. The re-designed timing cues included descriptions of important national events and neighborhood specific events (gathered in the neighborhood history calendars) that were so memorable that they served as time "anchors" for personal events (Belli 1998). In addition, special recording techniques were developed to facilitate its use in the study site, including: additional lines and symbols to record information for simultaneous multiple spouses, more complex symbols to record information about children (birth, death, living arrangements, school) on a single calendar line, and extra space on the calendar to record the exact date of the first event for domains (e.g., first marriage, childbearing, contraceptive use) that were central to the aims of the study. This exact date information allows the construction of measures of the precise timing of first marriages, childbirths, and contraceptive use to estimate either continuous survival analysis or discrete survival analysis using very short time intervals (such as person-months). For a more comprehensive and detailed description of the life history calendar methods, please see Axinn, Pearce, and Ghimire (1999), published in *Social Science Research*.

**Individual Marital Supplemental Data.** In 1996, all the married respondents were asked about their marital history, relationship and interaction. Those who were unmarried and identified married on monthly household registry update; they were interviewed for marital supplemental survey for spouse choice, marital processes, husband- wife communication and marital satisfaction from year 2006. This survey collected data from 878 married after 1996 individual interview with a response rate of 95 percent.

**Marital Dynamics Data.** In 2004, a pilot study was conducted to enrich the measures of rapidly changing marital values, beliefs and behaviors and their impacts on family relations and fertility. The purposes of this study were to create detailed measures of marriage timing, spouse choice, spousal attributes, marital quality and husband-wife relationships, and to understand the relationship between these marital processes and rapid social change in Nepal. This study collected data from 525 individuals with a response rate of 91 percent.

**Elderly Health and Wellbeing Survey Data.** In 2006, we conducted an elderly health and wellbeing interview of all residents of the sampled neighborhoods ages 45 and above. A "resident" was defined as someone who ate and slept in the household within the CVFS sample neighborhoods for more than half the time during the previous three months. The survey included an approximately 15 minute long questionnaire with questions pertaining to self-rated health, functional health and ability, care provider, smoking and alcohol use, and health service use. A total of 2,155 respondents from the 1,361 households from 151 sampled neighborhoods were interviewed and a response rate of 99 percent was achieved. These data will soon be available for analysis through the ICPSR at [www.icpsr.umich.edu](http://www.icpsr.umich.edu).

**Menstruation and Education.** This study was motivated by the desire to understand the impact of menstruation on the educational achievements of girls in school through either lack of access to sanitary products or through cultural norms and local practices during menstruation. This study measured the effect of having access to modern menstruation technology on girls' education in Nepal. In particular, this study randomized the allocation of a sanitary, re-usable menstrual cup to school

age girls and their mothers who would otherwise be using pieces of cloth as their sanitary protection. The pilot study interviewed 388 girls and their mothers from four schools in 2006.

**HIV/AIDS and Later Life Health and Wellbeing.** Research conducted on HIV/AIDS is geared toward understanding people's perceptions, attitudes, and practices about the prevalence of disease, disease risk factors and health care services (not about the diagnostic aspect *per se*). This study aims at answering: to what extent widespread social change is related to the prevalence of the disease; individual perceptions, attitudes and practices; and how social change affects the elderly physical and mental health and health service use. In 2009, a survey was administered to 352 individuals with a response rate of 87 percent. The survey included important measures of the health and wellbeing of older adults, measures of sexually transmitted disease (STDs), and HIV/AIDS prevalence, associated risk factors, and individual knowledge, and attitudes.

**Religious Life Study.** The purpose of this study was to understand how religion is thought of and practiced in Chitwan. Specifically, the study explores religious beliefs and practices and other aspects of life that may be related. In this study, information is collected about respondent's demographic information and experiences, religious beliefs, family attitudes and religious practices. The pilot study interviewed 329 individuals with a response rate of 92 percent in 2007.

**Developmental Idealism and Family Dynamics Study.** The initial study was designed to create research instruments for measuring the prevalence and influence of developmental idealism on family behavior in Nepal. This study is designed to create and test research instruments for measuring the concept of "developmental idealism". The initial study collected data from 537 respondents with a response rate of 97 percent in 2003 and evaluated the effectiveness and usefulness of the research instruments.

**Armed Conflict, Family Change, and Mental Health.** In 2008, a pilot study was conducted to enhance understanding of individual mental health conditions, health services availability, and their interrelationships with decade long armed conflict as well as social change. The study collected information related to screening of disorders, problem of depression, mania, panic disorder, generalized anxiety disorder, intermittent explosive disorder, psychosis, and post traumatic stress disorder. This research also included a clinical interview of psychiatric problems. This research has assisted with the translation, refinement and validation of key mental health measures used in the World Mental Health Survey Initiative to produce a viable survey measurement tool for rural Nepal. This study collected data from 483 individuals with a response rate of 89 percent.

**Modular Design Approach to Survey Data Collection.** In 2013, a survey was administered to 432 individuals between the ages of 18-24 from CVFS samples. The goals of this study was to (a) design a set of survey questions; (b) identify an address-based representative sample; (c) pilot the survey; and (d) analyze the data to determine which survey methods were most effective. The purpose is to explore the feasibility and evaluate the effectiveness of a modular design approach to survey data collection. The widespread use of mobile phones offers a potentially new mode for survey data collection—text messaging. Thus, this study tested the modular design approach to survey data collection that uses state-of-the-art mobile phone technology. The survey was administered using two modes (telephone and text messaging) and two approaches (traditional and modular) to explore the feasibility and compare the effectiveness of these survey data collection methods. Currently, the data is at cleaning stage.

**Measurement of Marital Interactions and Relationship Dynamics.** This exploratory study includes the creation of context specific measures and a

coding system of marital relationship dynamics; specifically marital interaction in a non-western setting. The goals of the pilot study are to (a) identify - the dimensions and measures of marital relationship dynamics; (b) design a setting-specific observational coding scheme; (c) pre-test the instrument; and (d) collect and analyze the preliminary data to determine the effectiveness of the instrument as well as test western notions of marital quality in a radically different non-western setting. This study collected qualitative data from 30 married couples and currently evaluating the effectiveness and usefulness of the research instrument. Currently, the data is at cleaning stage.

### **Second Wave (2008) of Individual Interview with New Ideational Survey Data**

In 2008, we conducted the second wave of the 1996 individual survey with a substantial portion of ideational measures on a refreshed sample of individuals that include both individuals interviewed in 1996 and new individuals who moved to our 151 sample neighborhoods or who aged and become eligible samples. Much of the original content from the 1996 individual survey and life history calendar were included, and many new questions designed to measure the influence of ideational factors on family life were added to the survey. The new ideational measures covered topics such as values and beliefs about societal attributes; modern family life; family change; and freedom and equality. Also included in the survey were Inglehart's measures of traditional/secular-rational and survival/self-expression values (Inglehart 2003), and Schwartz's measures of value orientations (Schwartz 2006).

A total of 5,190 individual interviews were completed with an overall response rate of 97%. This survey sample includes (i) individuals ages between 15-34 living in sample neighborhoods (1-151); (ii) spouses of these married individuals (may or may not be living in the sample neighborhoods); (iii) parents of any of these unmarried individual (may or may not be living in the sample neighborhoods); and (iv) all other individuals residing in the sample neighborhoods between the ages of 35 and 59.

In addition, a total of 650 individuals of ages between 12-14 years in 2008 have also been interviewed as they reached age 15 with a response rate of 98%. These data will soon be available for analysis through the ICPSR at [www.icpsr.umich.edu](http://www.icpsr.umich.edu).

**1996-2008 Panel Data.** In 2008, we re-interviewed individuals who were interviewed in 1996 individual survey. Of the total 4,646 individuals interviewed in 1996 from the 151 sample neighborhoods, we excluded 87 permanent Indian, 72 individuals living in group quarters and 4 other individuals who were misidentified in 1996. In addition, 219 individuals were died between 1996 interview and 2008 census resulting an eligible sample of 4,264 individuals for panel data collection. Of the total 4,264 eligible individuals, 4,052 respondents have been re-interviewed with a response rate of 95%. These data will also be available for analysis through the ICPSR at [www.icpsr.umich.edu](http://www.icpsr.umich.edu).

### **Monthly Population Panel Study Data**

**Household Registry and Family Planning Instrument.** The Chitwan Valley Family Study includes an extensive prospective panel study. A monthly demographic event registry forms the backbone of the study. Beginning in February of 1997, interviewers visited each household monthly to monitor births, deaths, marriages, divorces, contraceptive use, pregnancies, and changes in living arrangements and household composition. Unfortunately, due to budget constraints, previous projects were not able to collect data from all 171 neighborhoods included in our original sample. Instead, this demographic event registry includes 151 of those neighborhoods. The 151 neighborhoods include 1,582 households and 4,646

individuals interviewed as part of the original study and new houses and individuals moved into the neighborhoods between 1996 and the 2008 household census. Data on these 151 neighborhoods provide the full contextual and ethnic heterogeneity imbedded in our original study design, even if they provide somewhat fewer cases. Furthermore, all residents of these 1,582 households have been followed over time, including households that have moved out of the study area. This means that the prospective panel data are maintained for all respondents interviewed in the original study, regardless of migration behavior.

Interviewers visit each household monthly and interview one household member who is capable of reporting on all changes in the household. Of course, these household informants may not be fully aware of other household members' contraceptive use, and may misreport it as a result. Thus, to ensure accuracy, we individually interview each household member age 18 and older until 45 years of age about their contraceptive use. To maintain confidentiality, responses are recorded on a separate form. The interviewing is conducted by the same interviewers and supervisors who collected the original individual interviews (including life histories), so they are familiar to the respondents.

The monthly panel study of demographic events also adds new households to the sample when they move into a study neighborhood. In other words, all households from the household-level data collection are followed and included in the panel study regardless of whether and where they move within Nepal; new households are also added to the study but are not followed if they move. Because many of these neighborhoods are migration destinations, the number of new households is substantial (1,151 new households added between 1996 and 2008).

The demographic event registry is conducted with the same quality assurance procedures as our other survey work. Over the first year, we maintained a response rate of 98% for the household interviews and 92% for the individual-level interviews on contraceptive use. The monthly demographic event registry is now in its 192nd (February 1997-January 2013) consecutive month, with a response rate of 97.8% for 186 months of data collection. This extremely high response rate helps ensure that attrition from the panel will not be a serious threat to the validity of analyses based on these data. We believe our extraordinarily high response rates are a function of the isolated character of the Nepalese respondent population, the hardworking nature of our Nepalese field staff, and our design that keeps our interviewers in a finite geographic area for lengthy periods of time. We continue to maintain high levels of data checking and all data are double entered into computerized form to reduce keying errors. The data for the 126 months collected from 1997 through the first half of 2008 are available for analyses. Several analyses have already been performed using months 1-72 of these data (Ghimire and Axinn Forthcoming; Ghimire and Hoelter 2007; Yabiku 2004). Additional data have been collected and are currently being processed and linked to the existing panel data. Both public use data and restricted use data for months 1-126 are available through the ICPSR at [www.icpsr.umich.edu](http://www.icpsr.umich.edu). The data (both household registry and family planning) for the months 1-192 are currently ready for analysis and will be available through the ICPSR as well.

**Prospective Panel Data on Ideational Factors.** An innovative element of the second wave of individual interview with new ideational survey administered in 2008 is the prospective measure of the changes in individuals' attitudes, beliefs, and values. The data is collected from individuals (main sample participant, parents, and spouses) who were interviewed in the original 2008 interviews. These updates along with the 2008 data provide the information necessary for a dynamic study of the ideational influences on marriage and childbearing. Data collection for this study is

completed with over 97 percent response rate. All waves (wave 1-9) data will be merged with the 2008 main data and will be made available through the ICPSR soon. In addition, individuals age 12-14 in year 2008 and were also interviewed for this prospective panel study on ideational factors. All 9 waves data has been collected with this group of respondents with over 93% response rate

## Migration

With the aim of enhancing our understanding of the factors that influence population mobility and being influenced by the surge, the following migration studies have been conducted.

**Nepali Migrants to Gulf Cooperation Council (GCC) Countries.** In 2009, a study was launched to provide a comparative insight into destination choices and its relation to migrant's values, behavior and remittance. This study focused on migrants from Chitwan Valley, who migrated to the Gulf Cooperation Council (GCC) countries, the second most popular migration destination next to India, for employment. This study particularly focused on: 1) migrant values and behavior; 2) migrant spending, saving, and remittances; 3) migrant plans concerning their departures from the Gulf; 4) comparisons of migrants and their influences in the different Gulf countries; and 5) comparison of migrants to the Gulf with their counterparts who did not migrate. An innovative element of this research is the use of telephone interview technique to call migrants in the Gulf countries from Chitwan – a first of its kind in Nepal. The first and second wave of data collection from 398 Gulf migrants from Chitwan Valley has been completed with a response rate of 87%.

**Innovative Methods for Obtaining Survey Data from Migrants.** Encouraged by the success of the Gulf Migration study, in 2011, this research was launched. The purpose of this study is to create and evaluate new and innovative procedures for collecting data from individuals and families in one area and linking that information to individuals and families who have migrated from that area to other places around the world. Recently, a total of 451 additional migrants (with a response rate of 81%) who migrated around the world from Chitwan have been interviewed for first and second wave. In addition, 542 individuals (with a response rate of 78%) who migrated within Nepal from Chitwan have been interviewed.

**Measurement of Remittance Use.** In 2013, a pilot study was implemented to measure the use of remittances by remittance receiving households of western Chitwan Valley. A survey instrument was designed and administered to 185 (with a response rate of 99%) remittance receiving households. The data on remittance use was collected in key dimensions of household activities such as the use of remittances on household items, consumption, health and education, farming, festivals and cultural events, saving, and investment. Data is at the cleaning stage.

**Household Diversification and Migration.** This exploratory study is designed to understand how agriculture and non-agriculture jobs affect whether people migrate or not. For this study, we want to understand what things affect whether people migrate or not. For the purpose, in the first stage (baseline data), data from 545 households and over 1,900 individuals of Chitwan Valley in 2013 have been collected and is at the analysis stage. Moreover, the circumstances of households and people always change; people get new jobs, people quit jobs, people earn more or less money, households buy more livestock or a different kind of livestock, and households change the types of crops they grow. There are especially many changes between seasons. For these reasons, this study is designed to visit households every four months and there will be a total of six of these follow-up visits to each household. Currently, second follow-up data collection is in the field.

## Environment Data

**Neighborhood Mapping.** A combination of Global Positioning System (GPS) readings and a topographic survey map of Chitwan Valley were used to determine exact latitude and longitude locations of each neighborhood in the study. The 1995-1996 HMG Nepal Topographic Survey Map (1:25000) was developed from aerial photos taken in 1992 and ground truthed. Coordinates for wooded areas/forests within Western Chitwan Valley have also been digitized. Furthermore, land use mapping teams gathered data on specific locations within communities (e.g., hospitals, schools, water tanks, and bus stops) that have been added to the GIS digital database. Land capability data have also been digitized from 1:50000 Land Systems, Land Capability, and Land Utilization maps from the Nepal Governments' Survey Department. Geographic data gathered in the field have been linked to the data digitized from secondary data sources (i.e., topographic and thematic maps of the area) and entered into a GIS database maintained by Stephen Matthews and supported by the GIA Core at the Population Research Institute at Penn State. Stephen Matthews provided training in these mapping procedures and technologies.

**Land Use Survey.** A systematic sample of 151 neighborhoods was selected by mapping all households in Western Chitwan Valley and choosing clusters of five to fifteen households with equal probability. Using this household-based selection of clusters, we established boundaries around our neighborhoods so that every unit of land in Chitwan had one and only one chance of falling in our sample. These neighborhood boundaries became the perimeters for our land use measures. The first round of measures were collected between January and April of 1996. Using compasses and tape measures, teams of field workers mapped the geographic area of all 171 neighborhoods, including all boundaries within neighborhood land parcels. Many distinct categories of land use were identified and mapped on these parcels, including common land (grazing, forest, plantation), multiple types of agricultural land (up land (fallow or cultivated), irrigated low land (fallow or cultivated), rainfed low land (fallow or cultivated), private grazing land, and private plantations), and other uses (e.g. household residences, schools, temples, mills, roads, irrigation canals, rivers, or ponds and waterways). The land area data were computerized and used to calculate the area of land used for each type in each neighborhood. The area of the neighborhoods ranges from 4049 to 2764242 square feet (Shivakoti, Axinn, Bhandari, and Chhetri 1999). The same measurement procedures were followed again in 2000 and 2006 to create panel data on land use at the neighborhood-level.

We also have measures of land use from the household agricultural practices and environmental consumption survey (described above) that include land owners' reports of the distribution of land being used for different purposes (such as cultivated land, garden land, grazing land, and forest), and specific details of agricultural practices on cultivated land (including crop rotations, seed varieties used, applications of fertilizers and pesticides, and use of mechanized implements). These data are available through the ICPSR at [www.icpsr.umich.edu](http://www.icpsr.umich.edu) for restricted use.

**Forest Plot and Common Land Plot Flora Surveys.** Flora samples were collected and analyzed from 265 land plots in the study site. These plots were of two types: forest plots and common land plots. The sample of 127 forest plots were drawn from three forest areas surrounding Chitwan Valley: Barandabar Forest (62 plots), Royal Chitwan National Park (34 plots plus 10 grassland plots), and forest land near the Naranyani River (21 plots). The forest plots in Barandabar Forest are arranged at 250 meter intervals along equally spaced (1 km) transects that extend 1250 meters into the forest. In Chitwan National Park, the transects are equally spaced (1 km) but consist of two plots at 250 and 1250 meters depth in from the edge of the forest. The Naranyani River forests are quite small in size (less than 1.25 km wide) and did not permit the use of the transect sampling frame. Instead, the

sampling frame was drawn from along a W-shaped transect, producing plots that are either easily accessible (near the edge of the forest) or not very accessible (on the farthest side of the forested area). Each forest plot consists of a series of overlapping sample areas. A tree plot measures 10 by 10 meters and defines the perimeter. One shrub plot is located at the center of each forest plot and measures 3 by 3 meters. Five grass plots, each measuring 1 by 1 meter, are selected based on a W-shaped profile.

The 138 common land plots were selected differently than the forest plots. A 10 by 10 meter plot was chosen from a list of common land grazing areas named by respondents in each neighborhood in the household agriculture and consumption survey. Three 1 by 1 meter plots were then chosen along the Northwest-Southeast diagonal within each 10 by 10 meter plot for counting and classifying grass species. Plant identification in both types of plots was carried out with the help of flora manuals and weed identification methods developed by Dr. Dharma Dangol of the Department of Environmental Sciences at the Institute of Agriculture and Animal Science (Dangol 1994). From each plot, flora teams counted the number of different tree, shrub, and grass species (biodiversity), the height and diameter of the largest and smallest specimens of each tree and shrub species, and used the Braun Blanquet scale to estimate the proportion of the plot covered by each species (ground cover). Other measures included: depth of humus (in cm), soil texture, evidence of erosion, pest and animal damage (e.g., trampling), and if the plot was under forest management. The flora teams were trained in trail blazing, or course navigation, techniques to enable them to follow paths through difficult terrain such as forest to facilitate the location of sampled flora sites.

Flora counts were conducted at the same time of year for the 1996 (Time 1), 2000 (Time 2), and 2006 (Time 3) measures (January-March) because species may present themselves differently during different seasons. Biodiversity was measured by recording the number and type of each species at each time.

All forest and common land plots were located and identified on the Nepalese Governments' Topographic Survey Maps of Chitwan (scaled 1:25000). The flora data collection teams used traditional mapping and survey techniques to record the directions to and location of all plots. In 1996, the teams also placed locator tags at each forest plot, which helped in the successful relocation of all forest plots in the year 2000, and the 2006. The environment data are available through the ICPSR at [www.icpsr.umich.edu](http://www.icpsr.umich.edu).

**Community Forestry.** This project collected information using Global Positioning System (GPS) from 21 community forestry areas existing in western Chitwan in 2008 to better understand forest management systems as well as human effects such as grazing and, firewood and fodder collection on flora species diversity in the Valley. The data included location, area, perimeter and community forest resource management and use.

**Arsenic and Groundwater Quality Tests.** Research suggests that drinking of water with high arsenic content causes various skin diseases, jaundice, and cancer. This study was designed to investigate and monitor the level of arsenic in drinking water of western Chitwan Valley. In 2004, ISER-N collected samples from 1,445 drinking water sources used by over 2,500 households living in the study area and tested its arsenic content. The result of this study was shared with the local communities and the drinking water sources that had arsenic content higher than the levels recommended by the World Health Organization (WHO) were dismantled and replaced by new sources.

**Water Quality.** This study aimed to analyze the water quality of western Chitwan. In 1997, 192 water samples were collected and analyzed for PH level, Specific conductivity, Suspended and dissolved solids, Inorg nitrogen and

phosphorus, and Chemical O<sub>2</sub> demand. Similarly, depth of the source, year of establishment and source condition (toilet, animal shed and garbage heap/compost heap within 20 meters) are collected of the source/sample.

**Weather Data.** This data includes daily information of Maximum Temperature, Minimum Temperature, Rainfall, Relative Humidity measured at 08:45am, and Relative Humidity measured at 17:45pm from year 1967 to 2010 which was measured at the National Maize Research Program (NMRP) farm Rampur, Chitwan (CVFS Study Area). This data is obtained from Department of Hydrology and Metrology, Government of Nepal.

**Tiger Tolerance Survey.** In June 2008 a focus group interview was conducted with 10 people from Chitwan to discuss their beliefs and perceptions about tigers. Insights from this group were used to understand the vernacular and modify previously tested survey items. Research staff from ISER–N ensured internal validity of the survey measures. Then, a structured survey was designed to record individual interactions with tigers, their beliefs about tigers, beliefs about tiger-related risks, perceptions of tiger-related risks, and preferred future tiger population size, as well as their demographics. In December 2009 the instrument was pre-tested ( $n = 17$ ) in a site adjacent to the study area, to improve survey effectiveness.

Wards (the smallest administrative unit in the district) that had at least 50% of their area within 1 km of Chitwan National Park or the multiple-use forest adjacent to the Park, where the majority of human–tiger conflicts occur, were selected. Ward boundary data were extracted from 1996 digital topographic data obtained from the Nepal Survey Department; these are the most recent data and little change in ward boundaries has occurred since. 500 residences within the wards based on residence locations in 1996 ( $n = 5,400$ ) were randomly selected. In February 2010 the name and age of all persons living in each of the 500 residences (inclusion criterion was that they must have been residing in the house during the week prior to the time when the survey would be administered) were recorded and compiled. From this list a single individual (age 15–59) was randomly selected for survey from each of the 500 residences. From March to April 2010 trained ISER–N interviewers contacted each possible respondent to administer the survey face-to-face. A total of 499 respondents were interviewed and a response rate of over 99 percent was achieved.

**Camera Trapping.** From January to May (i.e., the dry season before monsoon) in 2010 and 2011, state-of-the-art camera trap technology was used to collect field data on tigers, their main prey species [spotted deer (*Axis axis*), barking deer (*Muntiacus muntjak*), wild boar (*Sus scrofa*), sambar (*Rusa unicolor*), hog deer (*A. porcinus*), and gaur (*Bos gaurus*)], and human presence (local residents, tourists, army personnel, and vehicles). In both years, exact same locations inside and outside the Chitwan National Park in four successive blocks were selected, each sampled for ~20 d at ~20 locations. In 2011, one additional location in each block was selected; thus, we placed traps in a total of 76 locations in 2010 and 79 locations in 2011 (one trap was stolen in 2011). Traps were placed ~1 km apart across the study site, and their spatial coordinates were recorded using a global positioning system (GPS) receiver. Cameras were set to operate 24 h/d with no more than mechanical minimum delay between sequential photographs. For each picture, entity (i.e., tiger, prey species, or human presence type), location (based on trap identification), date, and time were recorded.

**Biomass Mapping (fuelwood use survey) of Chitwan.** This research was designed to answer: (a) how do demographic characteristics influence environmental resource usage (particularly wood and fodder collection)?, and (b) how are wood and fodder collection and environmental change linked in the Chitwan Valley? To answer these questions, data were collected from forest plots. Measurements were taken at 58 square 20 m × 20 m plots in the

Barandabar Forest in the east of the valley. The original sampling plots were designed to sample flora species composition at varying depth into the forest, to examine any gradient that might exist with distance from human settlement.

Within each 20 m x 20 m plot, measurements were taken of live standing trees and woody detritus (standing and fallen dead woody material). Standing live trees over 10 cm DBH were recorded in the 20 m x 20 m plot, while saplings and seedlings were recorded in 10 m x 10 m and four 1 m x 1 m subplots, respectively. The height of standing live trees was recorded using a laser rangefinder, and the DBH was measured with a caliper. Woody detritus measurements were also taken, although as they are not used in this study, the details are not discussed here. Coarse woody detritus material was almost non-existent in the sample plots, likely due to the rapidity with which woody materials are collected by the local population.

**Satellite Imagery Data** We have sections of 11 archival IKONOS images from 3/16/2000-10/31/2001, covering 786 sq. km. of the western Chitwan Valley. We also have imagery from a new collection of IKONOS-2 (1 m panchromatic / 4 m multispectral package) for the same 786 sq. km area in the western Chitwan Valley from March 2010. The imagery dates and attributes are below. Covering the entire study area requires four images (labeled west, mid-west, mid-east and east in the table below).

High resolution imagery (IKONOS - 4m multispectral, 2m panchromatic)						
<i>Acquisition date</i>	% Cloud	Elev. Angle	Azim Angle	Sun Elev.	Sun Angle	Chitwan Section
3/16/2000	0	83.22	120.79	50.84	133.50	West
11/10/2000	2	82.08	305.78	42.55	158.39	Mid-west
3/19/2001	0	81.98	319.74	55.38	140.39	Mid-east
10/30/2001	0	84.99	20.84	46.53	159.83	East
3/4/2010	0	60.61	19.46	50.14	144.98	East
3/4/2010	0	67.37	24.15	50.12	144.93	Mid-east
3/4/2010	0	80.4	55.55	50.10	144.79	West
3/4/2010	0	74.4	33.49	50.11	144.86	Mid-west

In addition, we also have L5/TM Data (Source NRSA Data Centre. National Remote Sensing Agency, Balanagar, Hyderabad, India (Ref: NRSA/NDC/FDS/7-5367/9-70147 (Received May 12, 2010).

SN	Path	Row	Date of Pass
1	141	41	06-Nov-1991
2	141	41	19-Nov-1996
3	142	41	28-Oct-1991
4	142	41	10-Nov-1996

**Climate Change, Vulnerability, and Adaptation Survey.** Implemented in 2009, this study investigated the impact of climate, as mediated by land-use and land-cover (LULC) change, on livelihood strategies and adaptive responses, focusing in part on a case study in the western Chitwan Valley. For the purpose, the sample was drawn following the three-stage sampling scheme from the Chitwan Valley Family Study (CVFS). First 6 settlements were randomly drawn from strata 1, seven from strata 2, and seven from strata 3. The original CVFS neighborhood maps from 1996 were digitized and entered in a Geographic Information System (GIS). From each neighborhood, all visible households within 250 meters of the neighborhood

boundary were digitized from 1-meter resolution IKONOS satellite imagery from March, 2010 (excluding all households within the CVFS survey neighborhood itself). From this set of points, a random sample of 30 "households" (actually rooftops) was drawn from each neighborhood. A total of 300 households (15 households per neighborhood in 20 neighborhoods) were selected. These households are asked about the household employment and farming activities, and on how weather affects of the household. A total of 294 respondents were interviewed and a response rate of over 98 percent was achieved.

**Coupled Nature Human (CNH): Invasive Species Data:** This study aims to generate feedback between the scenarios of different alien or exotic species in the community forests of Chitwan with its possible intervention from the period of 2013-2015. Primarily interested in the quantifying the percentage cover of alien species and problems chiefly associated with *Mikania micrantha*, focus will be made on vulnerability of community forest socio-ecosystems to a novel environmental threat and household resource use pattern around community forests. One of the aims is to assess the scenario of exotic plant invasion across 21 heterogeneous community forests in the buffer zone of Chitwan National Park. In 2013, ISER-N mapped *Mikania micrantha* including other invasive species from 987 forest plots of surrounding community forests of CVFS study area. Currently, the data is ready for analysis.

#### Other Data

**Conflict Incidents.** This study collected information about different conflict incidents. This includes number of arrest and torture, beating, bomb/ambush blast, disappearance, gun battle/firing, kidnap and killing and their Global Positioning System (GPS) locations of Western Chitwan over the conflict period. This study was conducted in 2009 and collected monthly number from January 1996 to December 2006.

**Tourist Data.** This data is obtained from secondary source. This data includes number of tourist visited in Chitwan National Park and total revenue to national park in Nepalese Rupees from year 1972 to 2012. This data is obtained from "Tourist and Revenue Record" of "Chitwan National Park".

**Divorce Data.** This data is about divorce cases registered in Chitwan District Court. This data contains yearly number of divorce cases registered by male and female from year 1965 to 2012. This data is obtained from the case record of District Court of Chitwan.

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