**Socio-economic indicators**

An initial search was made for socio-economic data within two primary Brazilian sources: IBGE and the Institute for Applied Economic Research, IPEA (*Instituto de Pesquisa Econômica Aplicada*). Census data from IBGE are available at the municipal level and span variables related to demography, education, income, work, agriculture, quality of life, and poverty. Special consideration was given to the fact that Brazilian municipal boundaries have changed significantly over the past two decades, as new municipalities have been created and municipal borders have been modified. These changes have been particularly prevalent in the Amazon region as new populations have migrated into the area. Between the 1991 and 2000 Brazilian censuses, 263 municipalities were created within our study area (through the division of previously existing municipalities), and between 2000 and 2010, 15 more new municipalities were created (all within the state of Mato Grosso). These changes complicate comparisons over time. To avoid problems associated with these changes, we chose to use data from the Atlas of Human Development in Brazil (*Atlas do Desenvolvimento Humano no Brasil* – www.atlasbrasil.org.br), which summarizes a large subset of demographic census variables collected by IBGE in 1991, 2000, and 2010, and adjusts each variable to fit the municipal borders associated with the 2010 census. This was accomplished by using the original census track level information from the 1991 and 2000 censuses and rearranging/recalculating the data to match 2010 municipal boundaries.

Within this dataset, we also include gold mining as an economic activity. Mining within Brazil is reported to the Brazilian National Department of Mines, DNPM (*Departamento Nacional de Produção Mineral*). Original shape files depicting all areas of reported mining activity in Brazil were downloaded from the DNPM website (<http://sigmine.dnpm.gov.br/webmap/>). We specifically selected the following gold mining categories, as defined by the DNPM: *lavra garimpeira* (small scale/alluvial mining), *licenciamento* (mining license), *requerimento de lavra* (mining authorization), *requerimento de* *licenciamento* (license authorization), and *concessão de lavra* (mining concession). Using ArcGIS, we matched the center of each mining polygon with the corresponding municipality and assigned gold mining presence/absence (1 and 0, respectively) to each municipality, based on the 2010 Brazilian county map.

The **SOCIO-ECONOMIC** database is organized into three separate files by year (1991, 2000, 2010) and each file contains the following fields:

1. MUNIC\_CODE: Municipal Code as defined by IBGE, consisting of seven numbers. The first two numbers identify the state.

2. MUNICIP: Name of municipality.

3. CENSUS\_YR: Census year when data was collected.

4. LIFE\_EXPECT: Life expectancy in years.

5. TOT\_FECUND: Total fecundity.

6. MORT\_5: Infant mortality up to 5 years old.

7. DEPEND\_RATIO: Dependency ratio calculated as the population younger than 15 years and 65 years or older, divided by the population 15 to 64 years old, multiplied by 100.

8. LIFE\_60: Probability that a newborn child will live to 60 years old.

9. AGING\_RATE: Aging rate calculated as the population 65 years or older divided by the total population multiplied by 100.

10. ILLIT\_15: Illiteracy rates for the population 15 years and older, calculated as the proportion of the total population in this age group that do not know how to read or write a simple note.

11. ILLIT\_18: Illiteracy rates for the population 18 years and older, calculated as the proportion of the total population in this age group that do not know how to read or write a simple note.

12. ILLIT\_25: Illiteracy rates for the population 25 years and older, calculated as the proportion of the total population in this age group that do not know how to read or write a simple note.

13. PRIM\_SCH\_18: Percent (%) of the population 18 years or older that completed primary school.

14. HIGH\_SCH\_18: Percent (%) of population 18 years or older that completed high school.

15. HIGH\_SCH\_25: Percent (%) of population 25 years or older that completed high school.

16. COLLEGE\_25: Percent (%) of population 25 years or older with completed college education.

17. GINI: Gini coefficient - Measures degree of inequality among individuals, based on per capita household income. Values vary between 0, where there is no inequality (per capita income of all individuals is the same), and 1, representing maximum inequality (only one person holds all income).

18. EXT\_POVERTY: Percent (%) of individuals living in extreme poverty (i.e., proportion of individuals with per capita household income equal to or less than R$70.00 per month, in Reais ($R) from August 2010). Only includes those individuals living in private permanent households.

19. EXT\_POVERTY\_CHILD: Percent (%) of children up to 14 years old living in extreme poverty (see #18 definition for extreme poverty). Only includes those individuals living in private permanent households.

20. POVERTY: Percent (%) of individuals living in poverty (i.e., proportion of individuals with per capita household income equal to or less than R$140.00 per month ($R from August 2010). Only includes those individuals living in private permanent households.

21. POVERTY\_CHILD: Percent (%) of children up to 14 years old living in poverty (see #20 definition for poverty). Only includes those individuals living in private permanent households.

22. INCOME: Average per capita income, calculated as the sum of all individuals incomes in private households divided by the total number of individuals living in private households. Values based on $R from August 2010.

23. THEIL: Theil index – Measures inequality in the distribution of individual household per capita income, excluding those who have no income. It is calculated as the log of the ratio of mathematical and geometric means of per capita household income, being 0 when no inequality is present up to infinity when inequality is at its maximum.

24. SELF-EMPLOY: Percent (%) of employed individuals 18 years and older that are self-employed.

25. EMPLOYERS: Percent (%) of employed individuals 18 years and older that are employers.

26. EMPL\_AGRO: Percent (%) of employed individuals 18 years and older that work in the agricultural sector.

27. EMPL\_COMM: Percent (%) of employed individuals 18 years and older that work in the commercial sector.

28. EMPL\_CONSTR: Percent (%) of employed individuals 18 years and older that work in the construction sector.

29. EMPL\_MINING: Percent (%) of employed individuals 18 years and older that work in the mining sector.

30. EMPL\_FORMAL: Percent (%) of employed individuals 18 years and older formally employed – that includes those with “*carteira assinada*”, military personnel, police, firefighters, public employees, and self-employed workers that contribute to the “*previdência oficial*”.

31. EMPL\_SERV: Percent (%) of employed individuals 18 years and older that work in the service sector.

32. EMPL\_INDUS: Percent (%) of employed individuals 18 years and older that work in industrial services for the public sector.

33. EMPL\_PROCES: Percent (%) of employed individuals 18 years and older that work in the processing sector.

34. ECON\_ACTIV: Ratio between individuals 10 years and older that were economically active – that is, those that were employed or unemployed during the Census reference week – and the total number of individuals within this age group, multiplied by 100. An unemployed person is one who is not working during the referenced week, but actively looked for work during the previous month.

35. UNEMPL: Percent (%) of the economically active population 10 years and older that was unemployed (see definition for unemployed #34).

36. EMPL\_OFFICIAL: Percent (%) of employed individuals 18 years and older that have a formal work contract (“*carteira assinada*”).

37. EMPL\_PUB: Percent (%) of individuals 18 years and older that work in the public sector.

38. PIPE\_WATER: Percent (%) of population that lives in households with piped water.

39. BATHROOM: Percent (%) of population that live in households with piped water and a bathroom (a separate room with a toilet and a shower or bath).

40. RM\_DENS: Percent (%) of population that live in households with more than two persons per bedroom.

41. GARBAGE: Percent (%) of population that live in households with garbage collection service. Only considers private permanent households located in urban areas.

42. ELECTRIC: Percent (%) of population that live in households with electricity.

43. WATER\_SEWER: Percent (%) of population living in households with inadequate water supply and sanitary sewage.

44. HOME\_EDUC\_CHILD: Percent (%) of children up to 14 years old that live in households where none of the residents has completed primary school.

45. NO\_SCHOOL6-14: Percent (%) of children 6 – 14 years old that do not attend school.

46. HOME\_EDUC: Percent (%) of individuals that live in households where none of the residents has completed primary school.

47. WOMEN10-14\_CHILD: Percent (%) of women 10 – 14 years old that have had children.

48. WOMEN15-17\_CHILD: Percent (%) of women 15 – 17 years old that have had children.

49. NO\_ELECTRIC: Percent (%) of individuals that live in households without electricity.

50. MALE\_0-4YR: Male population 0-4 years of age.

51. MALE\_5-9YR: Male population 5-9 years of age.

52. MALE\_10-14YR: Male population 10-14 years of age.

53. MALE\_15-19YR: Male population 15-19 years of age.

54. MALE\_20-24YR: Male population 20-24 years of age.

55. MALE\_25-29YR: Male population 25-29 years of age.

56. MALE\_30-34YR: Male population 30-34 years of age.

57. MALE\_35-39YR: Male population 35-39 years of age.

58. MALE\_40-44YR: Male population 40-44 years of age.

59. MALE\_45-49YR: Male population 45-49 years of age.

60. MALE\_50-54YR: Male population 50-54 years of age.

61. MALE\_55-59YR: Male population 55-59 years of age.

62. MALE\_60-64YR: Male population 60-64 years of age.

63. MALE\_65-69YR: Male population 65-69 years of age.

64. MALE\_70-74YR: Male population 70-74 years of age.

65. MALE\_75-79YR: Male population 75-79 years of age.

66. MALE\_80+YR: Male population 80 years of age or more.

67. MALE\_TOTAL: Total male population.

68. FEMALE\_0-4YR: Female population 0-4 years of age.

69. FEMALE\_5-9YR: Female population 5-9 years of age.

70. FEMALE\_10-14YR: Female population 10-14 years of age.

71. FEMALE\_15-19YR: Female population 15-19 years of age.

72. FEMALE\_20-24YR: Female population 20-24 years of age.

73. FEMALE\_25-29YR: Female population 25-29 years of age.

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78. FEMALE\_50-54YR: Female population 50-54 years of age.

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80. FEMALE\_60-64YR: Female population 60-64 years of age.

81. FEMALE\_65-69YR: Female population 65-69 years of age.

82. FEMALE\_70-74YR: Female population 70-74 years of age.

83. FEMALE\_75-79YR: Female population 75-79 years of age.

84. FEMALE\_80+YR: Female population 80 years of age or more.

85. FEMALE\_TOTAL: Total female population.

86. POP\_ECON: Economically active population 10 years and older: individuals employed or during the Census reference week or unemployed (looking for work during the previous month).

87. POP\_RURAL: Total resident population living in permanent private households in rural areas.

88. POP\_TOTAL: Total population.

89. POP\_URBAN: Total resident population living in permanent private households in urban areas.

90. POP\_10YR: Total resident population living in permanent private households 10 years of age or more.

91. POPULATION: Total resident population living in permanent private households. Excludes residents living in collective housing, boarding houses, hotels, prisons, military barracks, and hospitals.

92. HDI: Human Development Index – geometric mean of the three dimensions of Income (#95), Education (#93), and Life Expectance (#94), with equal weights.

93. HDI\_EDUC: Education index that is incorporated into the Human Development Index (HDI, #92). Calculated using the geometric mean of the sub-index for frequency of child and youth school attendance with a weight of 2/3, and the sub-index for adult schooling with a weight of 1/3.

94. HDI\_LIFE: Life expectancy index that is incorporated into the Human Development Index (HDI, #92). Calculated based on life expectancy using the following formula: [(observed life expectancy) – (minimum life expectancy)]/[(maximum life expectancy) – (minimum life expectancy)], where minimum and maximum values are 25 years and 85 years, respectively.

95. HDI\_INCOME: Index for the income dimension of the Human Development Index (HDI, #92). Calculated based on income per capita using the following formula: [ln (observed income per capita) – ln (minimum income per capita)]/[ln (maximum income per capita) – ln (minimum income per capita)], where minimum and maximum values are R$ 8.00 and R$4033.00, respectively [based on August 2010 Real (R$)].

96. CROPLAND: Area planted or to be planted with permanent and seasonal crops, in hectares.

97. TEMP\_CROP: Area planted or to be planted with seasonal crops, in hectares.

98. PERM\_CROP: Area planted or to be planted with permanent crops, in hectares.

99. PROD\_AGRO: Total value of agricultural products produced in the municipality, based on the value of the Real (R$) in 2000.

100. GDP\_AGRO: Gross value added to GDP from agricultural production, based on the value of the Real (R$) in 2000.

101. GDP: Gross domestic product for all economic activities in each municipality, based on the value of the Real (R$) in 2000.

102. GOLD\_MINING: Gold mining activity reported up to 1991/2000/2010, as presence (1) or absence (0).