

“The Impact of Credit on Village Economies”
Joseph P. Kaboski and Robert M. Townsend
Web Appendix

This appendix contains additional results referenced in Kaboski and Townsend’s “The Impact of Credit on Village Economies”. The first set of results are the detailed estimates of the coefficients on inverse village size interacted with pre-program year dummies as well as the F-tests for joint significance. The second set of results are the estimates using GIS controls which are shown to be nearly identical to the results in the paper. The third results reproduce the growth in net income using the monthly data. Fourth, we present the results are the long run impact estimates using GIS estimates, which are also quite close to those in the paper, but the GIS variables are significant. Finally, we include a color version of Figure 1, which enhances readability.

Table A.1.1 Pre-Program Inverse Village Size*Year Dummies for Summary Impacts

Technique \ Response Variable	Village Fund Short-Term Credit Level	New Short-Term Credit Level	Consumption Level	Asset Growth Rate	Net Income Growth Rate
Year 1	--	1.28** (0.13)	-0.20 (1.87)	--	--
Year 2	0.01 (0.07)	-0.01 (0.53)	-0.50 (1.95)	-3.30e-5 (1.91e-5)	1.80e-5 (3.30e-6)
Year 3	0.06 (0.07)	0.13 (0.51)	-0.80 (1.70)	-4.84e-6 (1.16e-5)	9.35e-6 (1.79e-5)
Year 4	0.02 (0.07)	-0.35 (0.53)	0.42 (1.85)	-1.32e-5 (1.31e-5)	9.04e-6 (1.88e-5)
Year 5	0.03 (0.07)	0.03 (0.52)	-0.53 (1.73)	-1.12e-5 (1.33e-5)	-1.67e-7 (1.43e-5)
Joint Significance p-level	0.93	0.93	0.90	0.09	0.68

** Significant at 5% level

* Significant at 10% level

Table A.1.2. Pre-Program Inverse Village Size*Year Dummies for Other Credit, Interest Rate, and Default

Response Variable Year Dummy Interaction	Other Formal Credit		Stated Reasons for Borrowing				Credit Market Indicators					
	BAAC/Ag. Coop Credit	Commercial Bank Credit	Credit for Agricultural Investment	Credit for Business Investment	Credit for Fert., Pest., etc.	Credit for Consumption	Year Borrowing			Year After Borrowing		
							Avg. Short-Term Credit Interest Rate	Probability of Short-Term Credit in Default	Informal Credit	Avg. Short-Term Credit Interest Rate [†]	Probability of Short-Term Credit in Default [†]	Informal Credit [†]
Year 1	-0.53 (0.72)	-0.11 (0.07)	0.36 (0.25)	0.14 (0.43)	-0.08 (0.67)	-0.60 (0.70)	1.61e-6 (5.93e-6)	3.76e-6 (1.38e-5)	-0.32 (0.64)	--	--	--
Year 2	-0.92 (0.67)	-0.13 (0.12)	0.16 (0.22)	0.08 (0.42)	0.10 (0.68)	-0.63 (0.74)	1.86e-6 (5.65e-6)	1.62e-5 (1.58e-5)	0.18 (0.40)	-4.23e-7 (2.37e-6)	5.35e-6 (7.70e-6)	0.32 (0.34)
Year 3	-0.07 (0.52)	-0.05 (0.14)	0.17 (0.18)	-0.26 (0.44)	0.02 (0.49)	-0.22 (0.56)	2.06e-6 (5.11e-6)	7.55e-6 (1.38e-5)	-0.22 (0.62)	7.62e-8 (2.64e-6)	-2.27e-6 (5.42e-6)	-0.10 (0.30)
Year 4	-1.15 (0.83)	-0.02 (0.03)	0.21 (0.25)	0.16 (0.23)	0.03 (0.59)	-0.25 (0.66)	4.23e-7 (5.22e-6)	1.55e-5 (1.34e-5)	0.02 (0.59)	-1.91e-6 (2.09e-6)	4.21e-6 (7.53e-6)	0.18 (0.30)
Year 5	-0.58 (0.65)	0.00 (0.01)	-0.08 (0.17)	0.16 (0.23)	-0.13 (0.54)	-0.46 (0.59)	4.34e-6 (4.79e-6)	1.62e-5 (1.53e-5)	-0.08 (0.57)	2.35e-6 (2.17e-6)	6.00e-6 (5.80e-6)	0.06 (0.26)
Joint Significance p-level	0.15	0.28	0.16	0.16	0.99	0.31	0.60	0.72	0.92	0.52	0.84	0.89

** Significant at 5% level

* Significant at 10% level

Table A.1.3 Pre-Program Inverse Village Size*Year Dummies for Consumption and its Components

Response Variable Year Dummy Interaction	Components of Consumption												
	Education	Grain	Dairy	Meat	Alcohol Home	Alcohol Out	Fuel	Tobacco	Ceremony	House Repair	Vehicle Repair	Clothes	Eating Out
Year 1	-0.12 (0.17)	0.02 (0.21)	-0.09 (0.09)	-0.16 (0.10)	-0.01 (0.10)	-0.02 (0.07)	0.07 (0.15)	-0.05* (0.03)	0.65* (0.33)	-0.14 (0.11)	-0.37 (0.40)	0.01 (0.03)	-0.06 (0.14)
Year 2	-0.16 (0.15)	0.20 (0.18)	-0.13 (0.09)	-0.03 (0.10)	0.01 (0.09)	-0.02 (0.05)	0.07 (0.16)	-0.03 (0.03)	0.14 (0.20)	-0.12 (0.11)	-0.39 (0.39)	0.01 (0.03)	-0.04 (0.13)
Year 3	-0.12 (0.12)	0.14 (0.14)	-0.09 (0.09)	-0.10 (0.08)	-0.01 (0.08)	0.00 (0.05)	-0.01 (0.13)	-0.03 (0.02)	0.28 (0.23)	0.15 (0.96)	-0.40 (0.36)	-0.02 (0.02)	-0.05 (0.09)
Year 4	-0.09 (0.11)	0.08 (0.14)	-0.13 (0.08)	-0.01 (0.08)	0.02 (0.06)	-0.02 (0.04)	0.02 (0.14)	-0.02 (0.02)	0.19 (0.22)	0.14 (0.11)	-0.39 (0.38)	0.02 (0.03)	-0.07 (0.12)
Year 5	-0.04 (0.10)	0.14 (0.15)	-0.05 (0.06)	-0.02 (0.08)	-0.02 (0.06)	0.01 (0.03)	-0.01 (0.14)	-0.04* (0.02)	0.05 (0.23)	0.17 (0.10)	-0.38 (0.38)	-0.00 (0.02)	-0.06 (0.11)
Joint Significance p-level	0.63	0.30	0.35	0.34	0.74	0.49	0.82	0.26	0.60	0.97	0.81	0.17	0.91

** Significant at 5% level

* Significant at 10% level

Table A.1.4. Pre-Program Inverse Village Size*Year Dummies for Productive Activities

Response Variable Year Dummy Interaction	Components of Income					Investment and Input Uses						
	Business Profits	Wage and Salary	Rice Farming	Other Crops	Livestock	Number of New Businesses	Amount of Business Investment	Probability of Business Investment	Amount of Agric. Investment	Probability of Agric. Investment	Total Wages Paid	Fert., Pest., etc. Expenditures
Year 1	--	--	--	--	--	1.11e-6 (7.12e-6)	0.30 (0.42)	5.55e-6 (4.60e-6)	-1.12 (-1.06)	-1.69e-5 (1.02e-5)	0.39 (0.49)	-0.56 (1.10)
Year 2	0.38 (0.97)	-0.02 (0.25)	0.42 (0.52)	-0.42 (0.99)	-0.59 (0.74)	2.45e-7 (7.34e-6)	0.29 (0.48)	3.60e-6 (5.55e-6)	-1.20 (1.06)	-1.29e-5 (1.04e-5)	0.28 (0.45)	-0.37 (1.08)
Year 3	0.37 (0.72)	0.02 (0.16)	0.43 (0.52)	-0.28 (0.69)	-0.55 (0.67)	1.76e-6 (6.97e-6)	0.13 (0.42)	3.39e-6 (5.15e-6)	-0.91 (0.95)	-8.88e-6 (9.85e-6)	-0.09 (0.36)	-0.39 (1.03)
Year 4	-1.04 (0.73)	-0.13 (0.24)	0.41 (0.34)	0.34 (0.68)	-0.70 (0.77)	1.14e-6 (7.29e-6)	0.24 (0.45)	4.63e-6 (5.40e-6)	-1.23 (1.08)	-1.51e-5 (1.00e-5)	-0.11 (0.41)	-0.70 (1.13)
Year 5	-0.41 (0.79)	-0.52** (0.20)	0.64 (0.42)	0.46 (0.51)	0.00 (0.16)	1.10e-6 (7.13e-6)	0.26 (0.33)	3.52e-6 (5.18e-6)	-1.12 (1.00)	-1.17e-5 (8.92e-6)	-0.40 (0.50)	-0.50 (1.12)
Joint Significance p-level	0.65	0.03**	0.65	0.12	0.70	0.99	0.86	0.94	0.47	0.44	0.23	0.45

** Significant at 5% level

* Significant at 10% level

Table A2.1. Effect of GIS on Summary Impact Variables

Technique \ Response Variable	New Short-Term Credit Level	Consumption Level	Asset Growth Rate	Net Income Growth Rate
GIS variable coefficient/100	-1300 (4900)	-400 (12,900)	0.057 (0.071)	0.249 (0.153)
Village Fund Credit Coefficient: with GIS	19,000** (6600)	17,200** (8900)	-0.056 (0.147)	0.668** (0.270)
Village Fund Credit Coefficient: Baseline	19,200** (6700)	17,100** (8800)	-0.073 (0.163)	0.737** (0.330)

** Significant at 5% level * Significant at 10% level

Village fund credit coefficients are multiplied by 10,000, representing roughly a treatment effect, since the program led to an average of 9000 baht village fund credit per household. GIS coefficients are divided by 1,000,000 (putting them in roughly per baht terms, since that was the total injection in the village) and multiplied by 10,000. Thus, they are scaled similar to the a treatment effect, since the program led to an average of 9000 baht village fund credit per household in the first two years. The independent variables are year dummies, household fixed effect dummies, male head of household dummy, number of adult males, number of adult females, number of kids, age of head and age of head squared, and years of schooling of head. The additional instruments in the first-stage are the inverse village size interacted with a dummy variable for year=2002 and year=2003. Standard errors for are robust standard errors clustered by village-year.

Table A2.2. Effect of GIS on Impacts on Other Credit, Interest Rate, and Default

Technique \ Response Variable	New Short-Term Credit	Other Formal Credit		Stated Reasons for Borrowing				Credit Market Indicators					
		BAAC/Ag. Coop Credit	Commercial Bank Credit	Credit for Agricultural Investment	Credit for Business Investment	Credit for Fert., Pest., etc.	Credit for Consumption	Year Borrowing			Year After Borrowing		
								Avg. Short-Term Credit Interest Rate	Probability of Short-Term Credit in Default	Informal Credit	Avg. Short-Term Credit Interest Rate†	Probability of Short-Term Credit in Default†	Informal Credit†
GIS variable coefficient/100	-1300 (5000)	-300 (3900)	-100 (400)	1400 (1100)	-3800 (2100)	4300 (4000)	-700 (3300)	-0.029 (0.019)	-0.037 (0.045)	-5 (2600)	-0.022 (0.019)	-0.035 (0.046)	1000 (2300)
Village Fund Credit Coefficient: with GIS	19,000** (6600)	7900 (6800)	800 (700)	-20 (1400)	2100 (2600)	8700 (6400)	8000** (3800)	-0.005 (0.023)	0.568 (0.542)	-2200 (3000)	0.003 (0.054)	0.131 (0.100)	-4500 (6000)
Village Fund Credit Coefficient: Baseline	19,200** (6700)	8000 (6900)	800 (700)	20 (1500)	2700 (2600)	8000 (6600)	8000** (0.38)	-0.008 (0.023)	0.637 (0.531)	-2200 (2800)	0.002 (0.056)	0.138 (0.101)	-4700 (5900)

** Significant at 5% level * Significant at 10% level

Village fund credit coefficients are multiplied by 10,000, representing roughly a treatment effect, since the program led to an average of 9000 baht village fund credit per household. GIS coefficients are divided by 1,000,000 (putting them in roughly per baht terms, since that was the total injection in the village) and multiplied by 10,000. Thus, they are scaled similar to the a treatment effect, since the program led to an average of 9000 baht village fund credit per household in the first two years. The independent variables are year dummies, household fixed effect dummies, male head of household dummy, number of adult males, number of adult females, number of kids, age of head and age of head squared, and years of schooling of head. The additional instruments in the first-stage are the inverse village size interacted with a dummy variable for year=2002 and year=2003. Standard errors for are robust standard errors clustered by village-year.

† Regressions are based on specification (3), where the treatment variable is the level of *lagged* village credit.

Table A2.3. Effect of GIS on Impacts on Consumption and its Components

Technique	Response Variable	Total	Components of Consumption												
			Education	Grain	Dairy	Meat	Alcohol Home	Alcohol Out	Fuel	Tobacco	Ceremony	House Repair	Vehicle Repair	Clothes	Eating Out
	GIS variable coefficient/1000000	2200 (2000)	-200 (1000)	2200** (1000)	100 (400)	300 (500)	100 (300)	100 (400)	-500 (1500)	300 (300)	800 (1200)	-1300 (6600)	-100 (600)	-20 (200)	100 (400)
	Village Fund Credit Coefficient: with GIS	17,200** (8900)	1000 (900)	800 (800)	500 (400)	700* (400)	800** (400)	200 (400)	-800 (1300)	300* (200)	-100 (1200)	13,100** (6100)	1800** (700)	-50 (200)	500 (300)
	Village Fund Credit Coefficient: Baseline	17,100** (8800)	1100 (900)	400 (900)	500 (400)	600* (400)	800** (300)	200 (400)	-700 (1200)	300* (200)	-200 (1200)	13,300** (6200)	1800** (700)	-50 (200)	500 (300)

** Significant at 5% level

* Significant at 10% level

Village fund credit coefficients are multiplied by 10,000, representing roughly a treatment effect, since the program led to an average of 9000 baht village fund credit per household. GIS coefficients are divided by 1,000,000 (putting them in roughly per baht terms, since that was the total injection in the village) and multiplied by 10,000. Thus, they are scaled similar to the a treatment effect, since the program led to an average of 9000 baht village fund credit per household in the first two years. The independent variables are year dummies, household fixed effect dummies, male head of household dummy, number of adult males, number of adult females, number of kids, age of head and age of head squared, and years of schooling of head. The additional instruments in the first-stage are the inverse village size interacted with a dummy variable for year=2002 and year=2003. Standard errors for are robust standard errors clustered by village-year.

Table A2.4. Effect of GIS on Impacts on Productive Activities

Technique \ Response Variable	Components of Income					Investment and Input Uses						
	Business Profits	Wage and Salary	Rice Farming	Other Crops	Livestock	Number of New Businesses	Amount of Business Investment	Probability of Business Investment	Amount of Agric. Investment	Probability of Agric. Investment	Total Wages Paid	Fert., Pest., etc. Expenditures
GIS variable coefficient/1000000	1900 (7100)	-4900 (3300)	-11,000** (5500)	24,600* (13,100)	1500 (7000)	-0.067** (0.022)	11,700 (10,300)	-0.001 (0.006)	-1800 (1800)	-0.029 (0.031)	4300 (3700)	9300 (6100)
Village Fund Credit Coefficient: with GIS	13,000 (16,000)	11,400* (6000)	400 (6100)	15,900 (10,300)	18,600 (19,700)	0.025 (0.028)	-5400 (5800)	0.009 (0.030)	-700 (3600)	0.015 (0.031)	-3100 (3400)	-300 (2200)
Village Fund Credit Coefficient: Baseline	10,700 (16,100)	12,500* (6600)	2100 (5600)	10,300 (11,400)	18,900 (20,900)	0.037 (0.031)	-3300 (4000)	-0.007 (0.029)	-400 (3800)	0.019 (0.032)	-2400 (3100)	-1300 (3100)

** Significant at 5% level

* Significant at 10% level

Village fund credit coefficients are multiplied by 10,000, representing roughly a treatment effect, since the program led to an average of 9000 baht village fund credit per household. GIS coefficients are divided by 1,000,000 (putting them in roughly per baht terms, since that was the total injection in the village) and multiplied by 10,000. Thus, they are scaled similar to the a treatment effect, since the program led to an average of 9000 baht village fund credit per household in the first two years. The independent variables are year dummies, household fixed effect dummies, male head of household dummy, number of adult males, number of adult females, number of kids, age of head and age of head squared, and years of schooling of head. The additional instruments in the first-stage are the inverse village size interacted with a dummy variable for year=2002 and year=2003. The fertilizer expenditure regressions also contain the area of cultivated land as an explanatory variable. Standard errors for are robust standard errors clustered by village-year.

Table A2.5. Effect of GIS on Differential Impacts of Female-Head Household

Technique \ Response Variable	Income		Components of Consumption						
	Business Profits	Wage and Salary	Education	Meat	Alcohol Home	Alcohol Out	House Repair	Vehicle Repair	Clothes
GIS variable coefficient/1000000	-2300 (7400)	4800 (3400)	-200 (1000)	400 (500)	-100 (300)	100 (400)	-1300 (6900)	1700 (800)	-5 (200)
Village Fund Credit Coefficient: with GIS	-7700 (6200)	3000 (4000)	-200 (600)	700** (200)	400* (200)	-500** (200)	-200 (4100)	100 (700)	200 (100)
Village Fund Credit Coefficient: Baseline	-7700 (6100)	3100 (4000)	-100 (600)	700* (300)	400* (200)	-500** (200)	-100 (3800)	100 (700)	200 (100)

** Significant at 5% level * Significant at 10% level

Village fund credit coefficients are multiplied by 10,000, representing roughly a treatment effect, since the program led to an average of 9000 baht village fund credit per household. GIS coefficients are divided by 1,000,000 (putting them in roughly per baht terms, since that was the total injection in the village) and multiplied by 10,000. Thus, they are scaled similar to the a treatment effect, since the program led to an average of 9000 baht village fund credit per household in the first two years. The independent variables are year dummies, household fixed effect dummies, male head of household dummy, number of adult males, number of adult females, number of kids, age of head and age of head squared, years of schooling of head, and inverse number of households in village. The additional instruments in the first-stage are the inverse village size interacted with a dummy variable for year=2002 and year=2003.

Table A3. Summary: Impact on Net Income Growth Using Monthly Data

Technique	Response Variable	Net Income Growth Rate
Number of Observations		13,741
OLS Regression		0.026 (0.020)
Baseline IV Regression		0.143** (0.048)
IV Regression without 1% Outliers		0.119** (0.045)

** Significant at 5% level

* Significant at 10% level

The independent variables are year dummies, household fixed effect dummies, male head of household dummy, number of adult males, number of adult females, number of kids, age of head and age of head squared, years of schooling of head, and inverse number of households in village. The treatment variable is the stock of short-term village fund credit. The outcome variable is the log growth of net income from the current period to 12-months ahead. The additional instruments in the first-stage are the inverse village size interacted with dummy variables for months after the fund was started. Standard errors for are robust standard errors clustered by village.

Table A4. Long Term Impacts

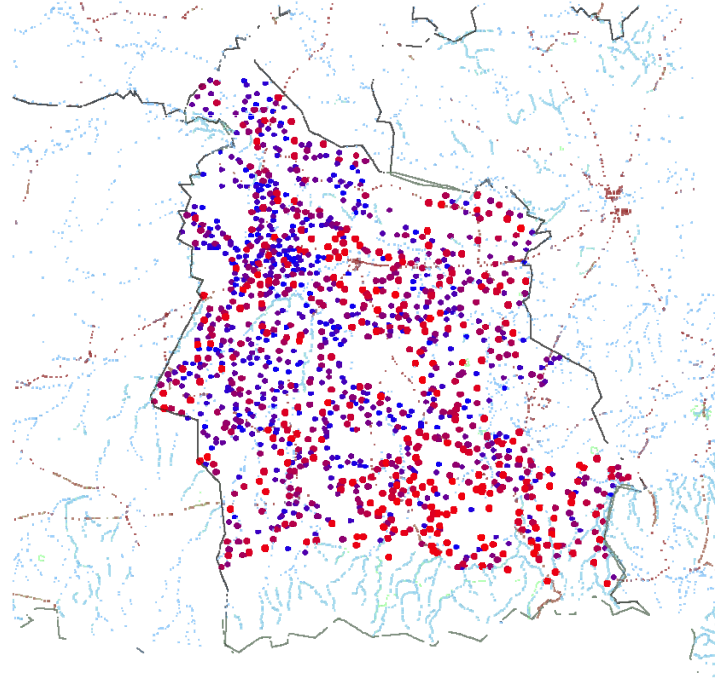
Response Variable Year	Response Variables											
	Village Fund Credit		New Short-Term Credit Level		Probability in Default		Consumption Level		Log Assets		Level of Net Income	
	Impact	GIS	Impact	GIS	Impact	GIS	Impact	GIS	Impact	GIS	Impact	GIS
Year 1 (2002)	0.50** (0.20)	-0.15 (0.20)	1.30** (0.55)	-0.38 (0.61)	-7.43e-6 (5.16e-6)	-6.06e-7 (6.28e-6)	1.04 (0.79)	-0.91 (1.60)	--	--	--	--
Year 2 (2003)	0.89** (0.10)	0.21 (0.14)	1.34** (0.67)	1.38 (0.84)	8.71e-6* (5.12e-6)	6.92e-6 (5.77e-6)	1.44 (0.90)	0.31 (1.36)	3.76e-6 (7.84e-6)	1.88e-6 (1.14e-5)	3.57** (1.35)	0.33 (1.28)
Year 3 (2004)	1.32** (0.30)	0.47 (0.44)	2.86** (1.08)	0.46 (1.07)	1.36e-6 (6.70e-6)	1.48e-7 (8.03e-6)	0.44 (1.02)	-0.44 (1.51)	1.10e-5 (8.41e-6)	3.79e-6 (1.29e-5)	-2.38 (1.87)	2.02 (2.62)
Year 4 (2005)	1.63** (0.24)	0.34 (0.33)	4.29** (1.18)	-1.65* (0.94)	1.58e-5** (6.29e-6)	1.64e-5** (1.17e-6)	1.71* (1.03)	-1.39 (1.42)	2.39e-6 (7.86e-6)	7.50e-6 (1.48e-5)	2.71 (2.37)	-2.96 (2.98)
Year 5 (2006)	1.61** (0.20)	0.70 (0.25)	4.63** (1.42)	0.19 (1.09)	7.93e-6 (5.62e-6)	-2.99e-6 (8.31e-6)	0.50 (0.93)	-4.06** (1.55)	2.99e-6 (9.56e-6)	4.74e-6 (1.86e-5)	1.97 (1.47)	-8.22** (3.84)
Year 6 (2007)	0.90** (0.16)	0.20 (0.20)	1.60** (0.69)	1.07 (0.78)	1.67e-5** (6.18e-6)	1.29e-5 (8.04e-6)	-0.11 (0.71)	-3.34** (1.64)	8.52e-6 (1.05e-5)	1.59e-6 (1.74e-6)	0.11 (1.40)	-12.00** (4.73)
F-test Joint Significance Level		0.01**		0.00**		0.11		0.00**		0.71		0.11

** Significant at 5% level * Significant at 10% level

Coefficients are divided by 1,000,000 (putting them in roughly per baht terms, since that was the total injection in the village) The independent variables are year dummies, household fixed effect dummies, male head of household dummy, number of adult males, number of adult females, number of kids, age of head and age of head squared, years of schooling of head, gross assets and gross assets squared, income, and inverse number of households in village.. The additional instruments in the first-stage are the inverse village size interacted with a dummy variable for year=2002 and year=2003.

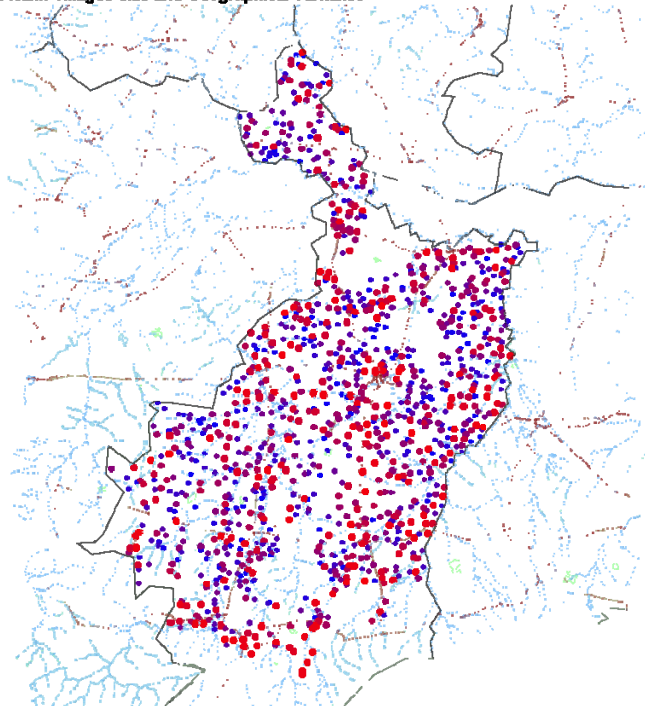
CDD Number of Household In Village From 2001

Si Sa Kot: Villages Size and Geographical Variables



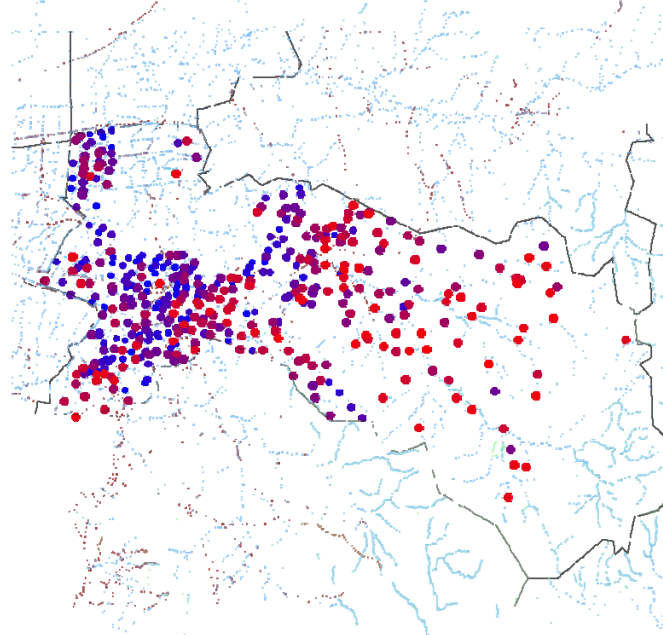
- Forest Cover
- FR
 - NF
 - WS
- Stream
- 1
 - 2
 - 3
- Road
- B
 - Road
 - 1
- Household Count
- 00 to 46
 - 46 to 69
 - 69 to 72
 - 72 to 84
 - 84 to 97
 - 97 to 114
 - 114 to 135
 - 135 to 165
 - 165 to 399

Buri Ram: Villages Size and Geographical Variables



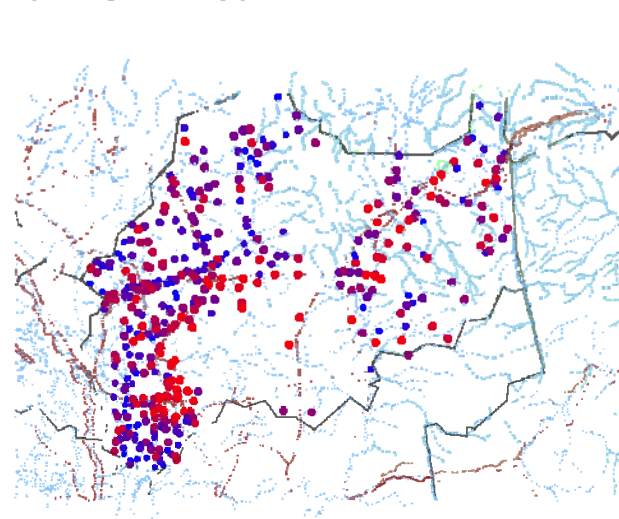
- Forest Cover
- FR
 - NF
 - NP
- Stream
- 1
 - 2
 - 3
 - 4
- Road
- Road
 - B
 - Road
 - 1
- Household Count
- 26 to 64
 - 64 to 70
 - 70 to 82
 - 82 to 95
 - 95 to 110
 - 110 to 122
 - 122 to 140
 - 140 to 163
 - 163 to 348

Chachoengsao: Villages Size and Geographical Variables



- Forest Cover
- FR
 - NF
 - NP
 - WS
- Stream
- 1
 - 2
 - 3
- Road
- Road
 - B
 - Road
 - 1
- Household Count
- 10 to 47
 - 47 to 65
 - 65 to 75
 - 75 to 91
 - 91 to 107
 - 107 to 128
 - 128 to 147
 - 147 to 200
 - 200 to 1221

Lop Buri: Villages Size and Geographical Variables



- Forest Cover
- FR
 - NF
- Stream
- 1
 - 2
 - 3
 - 4
 - 7
- Road
- Road
 - B
 - Road
 - 1
- Household Count
- 8 to 45
 - 46 to 65
 - 66 to 77
 - 77 to 90
 - 90 to 107
 - 107 to 123
 - 123 to 145
 - 145 to 192
 - 192 to 300