

Village name: _____

Rural social relations questionnaire (for villagers)

1. Your age? __ How many people in your family? __ How many folks live in this village? __

2. Which cities do you often visit in a month? And how many times?

Xi'an		Xianyang		Xunyi	
Other cities:					

3. Which village s do you often visit in a month? And how many times?

Town	Administrative village	Times
Chengguan	Cuijiahe (11)	
Chengguan	Xiayuanzi (14)	
Chengguan	Jiaojiahe (15)	
.....	

The above is an example form, which has omitted the latter part.

4. Are there any folks who work or study outside? __ Which cities/towns/villages? __

5. Are there any non- local visitors visiting you? __ How many people a week (month)? __

6. How many people are your frequent contact with, and the ones lived in cities or towns? __
lived in villages? __

7. What is your main purpose for visiting other villages? (multiple choice)

A. Children education B. Weddings and funerals C. Reciprocal Assistance D. Visiting friends and relatives. E. Buying or selling goods F. Entertainment G. Work H. Business I. others:

7. What is your main purpose for visiting other cities or towns? (multiple choice)

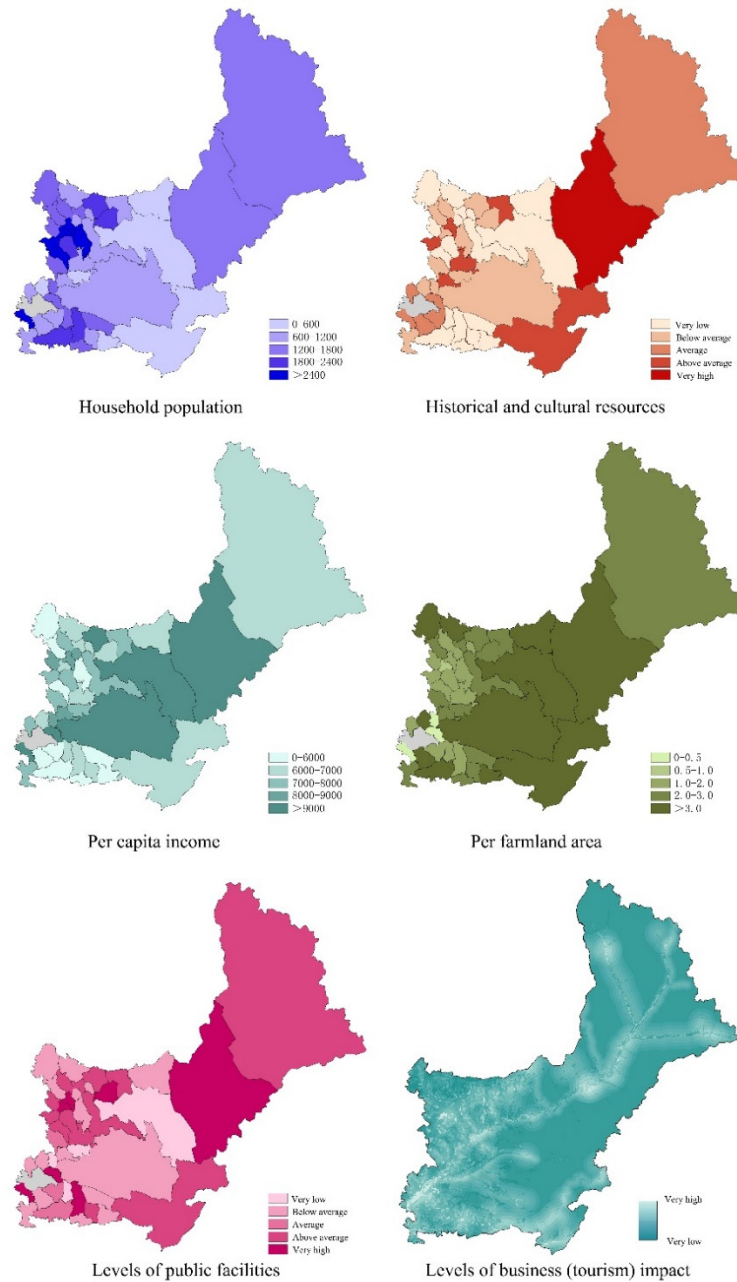
A. Children education B. Weddings and funerals C. Reciprocal Assistance D. Visiting friends and relatives. E. Buying or selling goods F. Entertainment G. Work H. Business I. others:

9. What is your main source of income? __

Rural information questionnaire (for village manager)

Village area (km ²)		Road hardening level (%)	
Farmland area (km ²)		Historical and cultural resources	
Household population		Landscape resources	
Per capita income (Yuan)		Water supply/drainage facilities	
Annual population change		Major industry	
Disaster areas		Farmland afforestation zones	
Levels of public facilities			
Primary school	Kindergarten	Cultural station	Clinic

The survey results of Sanshui Watershed



The figures show the partial rural survey results of Sanshui Watershed. Among them, the levels of public facilities and historical cultural resources could be judged through their quantity and quality subjectively. Meanwhile, the levels of business and disaster impact could be obtained through the superposition of buffer zones based on the influence strength of the origins. Then, the weighted superposition all the grids (with values) based on the weight could be determined by the analytical hierarchy process. With that, the potential of rural settlements could be obtained, and nature could be identified.

Data format of cellphone signaling data
(Processed and provided by “Intelligent Footprint” company)

Date	O_village ID	D_village ID	Population (Cellphone signaling)	Population (Real number)	O_Village name	D_Village name
20181008	1	2	3	7	Nanhao	Qujiawan
20181008	1	3	1	1	Nanhao	Ganyu
20181008	1	4	1	3	Nanhao	Ban
20181008	1	5	2	4	Nanhao	Lvjia
20181008	1	6	2	3	Nanhao	Xinhe
20181008	1	8	4	4	Nanhao	Mayayao
20181008	1	11	1	3	Nanhao	Zhaojia
...

The original mobile signaling data is huge and complex. Moreover, there is a world of difference between the field of data processing and this study. Therefore, the processed cellphone signaling data is provided by the “Intelligent Footprint” company directly. As shown in the table, according to our requirements, they had converted the original data to the format we could use easily, and calculate the number of real population mobility through the number and proportion of cellphone signaling.

The principle of extracting “flow” by cellphone signaling data: Initially, depending on the location, power, and coverage of a base station, the area is divided into multiple square "base areas" with generally 3–5 base stations inside and around it. When the user continues to contact the next base station in base area or frequently switches back to the original base station after accessing a new base station, the user will be identified as “stay point” if such state remains unchanged for half an hour. The stay point is initially identified as located in the base area. Then, according to the communication frequency and distance between the user in the base area and its neighboring base stations, the location centroid algorithm is used to interpolate and calculate more accurate coordinates of the stay point. Finally, when the stay point (start point) changes at intervals of 1 hour, the arrival point is recognized as the end point. If the user finishes the trip and the stay point does not change, the farthest stay point reached will be identified as the end point.