

revised 11/5/96

**VILLAGE TIES shared water source:**

**Water source:**

Villages indicate one source of water for agriculture (Q4.50), indicate the location of this source (Q4.51) and then list other villages that share this source (Q4.52.1 ... Q4.52.13).

We could “symmetrize” the village by village relation, **X**, by defining a tie between village i and village j as present if either i says that j shares its water source or j says that i shares its source.

**Relevant variables:**

Q4.52.1      Which other villages share this water source? 1st named village  
.  
.  
.  
Q4.52.13      13th named village

**Coding instructions:**

If Q4.52.1 = 9998 then go to the next village/record

(comment: the response is inapplicable, no other villages share the water source. I am assuming that remaining Q4.52.x variables will also be inapplicable, but this can be checked.)

(comment: The following lines will sort out whether Q4.52.1 is a village, district, or province number and then go to the appropriate coding description.)

if the first digit of Q4.52.1 is 2 then another village is named; skip to instructions for coding ties to other villages

if the first digit of Q4.52.1 is 3 then a village in another district is named; skip to instructions for coding ties to villages in other districts

if the first digit of Q4.52.1 is 4 then a village in another province is named; skip to instructions for coding ties to villages in other provinces

- skip to here if Q4.52.1 is a village number

let  $j$  = the position of the village named in Q4.52.1 in an ordered list of villages

$$x_{ij} = 1$$

(comment: village  $i$  has named village  $j$  as a village that shares the water source so the tie from  $i$  to  $j$  is coded as present.)

go to the next named village/district/province (Q4.52.2, ...)

- skip to here if Q4.52.1 is a district number:

let  $j$  = the position of the district named in Q4.52.1 in an ordered list of districts

$$y_{ij} = 1$$

(comment: village  $i$  has named district  $j$  as a district that shares the water source so the tie from  $i$  to  $j$  is coded as present.)

go to the next named village/district/province (Q4.52.2, ...)

- skip to here if Q4.52.1 is a province number:

let  $j$  = the position of the province named in Q4.52.1 in an ordered list of provinces

$$z_{ij} = 1$$

(comment: village  $i$  has named province  $j$  as a province that shares the water source so the tie from  $i$  to  $j$  is coded as present.)

go to the next named village/district/province (Q4.52.2, ...)

variables Q4.52.2 through Q4.52.13 will be coded in the same way as Q4.52.1

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Note: Since each village is naming other villages that share the specific water source that it named, it is not necessarily the case that if village  $i$  says village  $j$  shares its water source, that village  $j$  will also say that village  $i$  shares its source (the villages might name different sources). We can check for mutual naming by comparing  $\mathbf{X}$  and  $\mathbf{X}$ -transpose and also by verifying that the two villages named the same source (see Q4.50).

Also, we can symmetrize this relation by looking at the sum  $\mathbf{X} + \mathbf{X}'$  (where  $\mathbf{X}'$  is the transpose of  $\mathbf{X}$ ) and then dichotomizing so that a tie is present if the sum is greater than 0. Ties in the symmetrized matrix would indicate whether or not either village named the other as a village as sharing its water source.

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