Appendix 1. Forest growth in Geumsan from 1976 to 2010.

The overall forest cover of Geumsan, South Korea increased by a factor of 13.4 between 1976 and 2010.

Table A.1. Trends in forest cover in Geumsan from 1976 to 2010 (Source: KFS 2013, KNSO 2013).

Year	Growing stock (m^3)
1976	327,468
1995	1,116,566
2000	1,445,177
2005	2,559,201
2010	4,410,952

Model selection

We studied the factors determining cooperative transformation by means of multivariate logistic-regression models. Contextual factors included two factors (spatial extent of villages and size of the resource system), four continuous variables (number of villages, existence of tenant fees, ratio of cross-institutional links, and topographic location of villages), and one dichotomous variable (terrain of resource system). Our dependent variables (type of transformation) is dichotomous (1 if cooperative transformation and 0 if non-cooperative transformation). See Table A.2 for the values given to each variable.

Table A.2. Values of independent variables.

Variables	**Values**
Existence of tenant fees	1: annual tenant fees were collected 0: otherwise
Number of villages	Continuous. Range: 1-39
Ratio of cross-institutional links	Continuous. Range: 0-1
Spatial extent of villages	0: one village is involved; 1: multiple villages are involved but all are situated within one sub-district 2: multiple villages are involved and are situated over multiple sub-districts
Size of resource system	0: 1-10 hectares 1: 11-100 hectares 2: greater than 100 hectares
Terrain of resource system	1: considerable dry-field farming exists 0: otherwise
Topographic location of villages	Continuous. Range: 0.05-0.61

We used a model selection approach (Johnson and Omland 2004) to determine which sets of combinations of factors better explain cooperative transformation. We applied the Akaike Information

Criterion (AIC) method to compare the fits of all possible combinations of explanatory variables (Burnham and Anderson 2002). AIC is calculated for a suite of models and the best-fitting model has the smallest AIC. The absolute size of the AIC is unimportant; instead the difference in AIC values between the best fitting model and the others models (Δ_i) indicates the relative support for the models. In order to compare models, we calculate Akaike weights (*w*) as the probability that a model would be selected as the best fitting model if the data were collected again under identical circumstances (Burnham and Anderson, 2002):

$$w_i = \frac{\exp(-0.5 * \Delta_i)}{\sum_{r=1}^{R} \exp(-0.5 * \Delta_r)}$$

Where w_i is the Akaike weights for model i; Δ_i is the different between the AIC of the best fitting model and that of model i. The numerator is the relative likelihood of the model i. The denominator calculates the sum of the relative likelihoods for all candidate models.

For the set of models, Akaike weights sum to 1. A model whose Akaike weight is close to 1 is unambiguously supported by the data (Burnham and Anderson 2002). We consider as plausible models those with Akaike weights that are within 10% of the highest weight. We also calculated the relative variable importance as the sum of Akaike weights over all models including the explanatory variable. The relative variable importance is the probability that, of the variables considered, a certain variable is in the best approximating model. We calculated the model averaged estimates weighted by its Akaike weight (Burnham and Anderson 2002). Model-averaged parameter estimates are only calculated for those independent variables that are included in the confidence set of models.

All analyses were conducted using the R Project (R Development Core Team, 2008) for Statistical Computing package, particularly applying the package MuMln (Bartón 2012).