# Cultivation in China Grassland: Angel or Devil?

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**Key words :** cultivation , sustainable development , the grassland counties

**Introduction** Cultivation in grassland destroyed grassland ecosystem , reduced grazing grassland , and increased grassland degradation . However , this work discovered that the relationship between legal cultivation and grassland sustainable development was complex .

**Methods** 299 grassland counties around China were studied , including all the counties where grassland played an important role in primary industry ( Hou , et al . , 2007) . The grassland counties were divided into two groups according to two standards : (C2-C1) /C1 > 50% ; C2 > 10 ha ( the C1 was the average of cultivated land in 1989 , 1990 and 1991 ; the C2 was the average in 1999 , 2000 and 2001) : one group (CL) included 34 counties where cultivated land increased obviously , the other 265 counties were included into another group (NCL) . CL and NCL were studied by ordination and analysis of variance using more than twenty social and economic indexes , including Total Population Year-End , Yield of Grain , Output of Pork Beef and Mutton Meat , Total Revenue , Gross Domestic Product , and so on .

**Results and discussions** Territory of CL averaged 16004 $km^2$ , NCL's averaged 15954 $km^2$ . In ordination results using the natural , social , and economic indexes , CL and NCL in Inner Mongolia Autonomy Region in 1992 mixed together , the same result in 1999 . The results showed that the group of CL was not obviously different from NCL's . However , economy of CL developed more quickly than NCL's economy ( Table 1) . The indexes , for example Total Revenue and Revenue per Capita , of CL increased more quickly than NCL's . The results of analysis of variance did not prove that cultivation would constrain the economic development . At least , if cultivation had caused serious grassland degradation , the degradation did not influence income of rural residents and economic development of the CL counties . Moreover , cultivation did not influence rural residents income and economic development of the CL counties in the long run . This work did not advocate illegal cultivation in grassland , because all the above data only involved the legal cultivated land , so degradation , if it happened , was caused not by legal cultivation , but by illegally cultivating grassland .

**Table 1** *Economic indexes of CL and NCL in different years .*

| | 1990 | 1992 | | | | 1996 | 1999 | | | | 1992—1999 | | 2002 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | APCDI | NRP | YG | OPBM | TR | APCDI | NRP | YG | OPBM | TR | IYGPP | ITRPP | OAH | NSG |
| CLN | 34 | 33 | 33 | 33 | 33 | 34 | 33 | 33 | 33 | 33 | 33 | 33 | 34 | 34 |
| NCLN | 205 | 262 | 240 | 262 | 230 | 260 | 264 | 265 | 265 | 208 | 239 | 230 | 258 | 261 |
| CLA | 644 .7 | 14 .3 | 9 .4 | 0 .5 | 1596 .3 | 1770 .5 | 14 .8 | 16 .1 | 1 .2 | 95541 .6 | 223 .1 | 228 .9 | 14492 .7 | 48 .1 |
| NCLA | 589 .1 | 10 .7 | 10 .4 | 0 .6 | 1275 .5 | 1206 .8 | 11 .2 | 12 .2 | 1 .0 | 69943 .1 | 118 .0 | 113 .7 | 10165 .4 | 31 .7 |
| Sig | 0 .55 | 0 .12 | 0 .75 | 0 .31 | 0 .28 | 0 .00 | 0 .14 | 0 .39 | 0 .35 | 0 .00 | 0 .16 | 0 .01 | 0 .12 | 0 .00 |

Notes : CLN : Number of CL (unit) , NCLN : Number of NCL (unit) , CLA : Average of CL , NCLA : Average of NCL , Sig : P value of One-Way ANOVA . APCDI : Annual per Capita Disposable Income of Rural Residents (yuan) , NRP : Number of Rural population (10 000 persons) , YG : Yield Of Grain(10 thousands ton) , OPBM : Output Of Pork Beef And Mutton Meat(10 thousands ton) , TR :Total Revenue(10 thousands yuan) , IYGPP : Increments of Yield Of Grain per Capita from 1992 to 1999 (kilogram/ person) , ITRPP : Increments of Revenue per Capita from 1992 to 1999 (yuan/person) , OAH : Output of Animal Husbandry (10 thousands yuan) , NSG : Number of Sheep and Goats (year-end ,10 000 heads) .

**Conclusions and discussions** Economy of CL increased more quickly than NCL's during 1990-2000 . The relation between cultivation and sustainable development in China grassland was much more complex than expected , more influence details of cultivation on grassland should be studied to make sure that cultivation increased or decreased the stress on grassland conservation . Moreover , this work did not support illegal cultivation in grassland which degraded grassland without question , because all the above data only came from the legal cultivated land .

**References**

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