

**1. Fixed-response questions presented to farmers to assess their opinions on GGP.**

1. What is the level of your understanding about the Grain for Green Program (GGP)?
  - 1) Very well.
  - 2) Well.
  - 3) General.
  - 4) A little.
  - 5) Not at all.
2. Did you Participated in the GGP?
  - 1) Yes (Please answer question 3).
    - When did you participate the GGP?
    - How many of your cropland were returned to forest?
  - 2) No (Please answer question 4)
3. Did the quality of environment improved after the implementation of GGP?
  - 1) Improved.
  - 2) No change.
  - 3) Declined.
4. The reason for not participating the GGP.
  - 1) Willing to participate, but cropland was not included in the planned areas.
  - 2) Unwilling to participate, because the payment from government cannot compensate the loss of income.
  - 3) Don't know the GGP.
5. Do you concern about the local environmental protection issues?
  - 1) Very concern.
  - 2) Concern.
  - 3) Generally.
  - 4) A little.
  - 5) Not at all.
6. Do you know that GGP plays an important role in environmental protection?
  - 1) Very concern.
  - 2) Concern.
  - 3) Generally.
  - 4) A little.
  - 5) Not at all.
7. Is it good or not to participate GGP?

1) GOOD.

- Planting trees makes more money.
- Subsidies.
- Non-agricultural activities rather than agriculture are the main income source.
- Traditions and life style haven't been influenced.
- Protecting environment.

2) BAD.

- Income was reduced by return limited cropland.
- The ownership of cropland might be changed after participating GGP.
- Traditions and life style changed by GGP.
- Traditional diet and activity space are changed.
- The quality of environmental is not improved.

## **2. Outline of questions for interviewees (Village managers)**

1. What is main resource of income?
2. How about the residents' willingness of participation for GGP?
3. Does the GGP improve the environmental quality?
4. Does the GGP improve the income or life standard?
5. What is the response of residents to GGP?

## **3. Confusion matrix of the land use classification**

**Table S1.** Confusion matrix of the land use classification in 1993. The values in the table are the number of the pixels.

		Actual class							
		Cropland	Forest	Grassland	Residential area	Water	Total	User's accuracy (%)	Errors of commission (%)
Predicted class	Cropland	2791	260	156	97	160	3464	80.57	19.43
	Forest	293	4091	314	0	79	4793	85.35	14.65
	Grassland	51	184	2108	18	14	2375	88.76	11.24
	Residential area	0	0	0	1289	1	1290	99.92	0.08
	Water	0	0	0	4	2230	2234	80.57	0.18
	Total	3135	4535	2578	1424	2484	14, 156		
	Producer's accuracy (%)	89.03	90.21	81.77	90.52	89.77	Overall accuracy = 88.3654%		
Errors of omission (%)		10.97	9.79	18.23	9.48	10.23	Kappa coefficient = 0.8489		

**Table S2.** Confusion matrix of the land use classification in 1999. The values in the table are the number of the pixels.

		Actual class							
		Cropland	Forest	Grassland	Residential area	Water	Total	User's accuracy (%)	Errors of commission (%)
Predicted class	Cropland	2674	271	90	157	293	3485	76.73	23.27
	Forest	328	3913	257	5	18	4521	86.55	13.45
	Grassland	14	149	1918	0	4	2085	91.99	8.01
	Residential area	0	0	0	1981	9	1990	99.55	0.45
	Water	0	0	0	0	2028	2028	100	0
	Total	3016	4333	2265	2143	2352	14,109		
	Producer's accuracy (%)	88.66	90.31	84.68	92.44	86.22	Overall accuracy = 88.6952%		
Errors of omission (%)		11.34	9.69	15.32	7.56	13.78	Kappa coefficient = 0.8550		

**Table S3.** Confusion matrix of the land use classification in 2009. The values in the table are the number of the pixels.

		Actual class							
		Cropland	Forest	Grassland	Residential area	Water	Total	User's accuracy (%)	Errors of commission (%)
Predicted class	Cropland	4292	410	229	264	146	5341	80.36	19.64
	Forest	516	6855	388	5	322	8086	84.78	15.22
	Forest	38	27	3008	1	3	3077	97.76	2.24
	Residential area	0	0	0	2232	0	2232	100	0
	Water	0	162	0	1	2085	2248	92.75	7.25
	Total	4846	7454	3625	2503	2556	20,984		
	Producer's accuracy (%)	88.57	91.96	82.98	89.17	81.57	Overall accuracy = 88.0290%		
	Errors of omission (%)	11.43	8.04	17.02	10.83	18.43	Kappa coefficient = 0.8411		

**Table S4.** Confusion matrix of the land use classification in 2013. The values in the table are the number of the pixels.

		Actual area							
		Cropland	Forest	Grassland	Residential area	Water	Total	User's accuracy (%)	Errors of commission (%)
Predicted class	Cropland	8400	1282	427	893	280	11,282	74.45	25.55
	Forest	686	7201	133	12	147	8179	88.04	11.96
	Grassland	116	160	3725	6	5	4012	92.85	7.15
	Residential area	48	0	0	3697	3	3748	98.64	1.36
	Water	0	0	0	0	4229	4229	100	0
	Total	9250	8643	4285	4608	4664	31,450		
	Producer's accuracy (%)	90.81	83.32	86.93	80.23	90.67	Overall accuracy = 86.6518%		
	Errors of omission (%)	9.19	16.68	13.07	19.77	9.33	Kappa coefficient = 0.8262		