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The Second Phase of the Grain for Green Program: Adapting the Largest Reforestation Program in the World to the New Conditions in Rural China

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Abstract
This paper introduces the second phase of the Grain for Green. The first phase ran from 1999 to 2014, and the second phase started in 2015. The second phase of the GfG (GfG/2) addresses some problems of the first phase (GfG/1), in particular the lack of income for the farmers, as well as some changes to the rural areas, in particular the small number of remaining farmers. The paper describes how the GfG/2 (unlike the GfG/1) encourages farmers to organize themselves in cooperatives, or work with investors, and grow fruit trees to generate sustainable incomes. The paper also describes the constraints that prevent the smooth implementation of the GfG/2, in particular the insufficient financial support, the fact that some of the land that should be converted is "essential farmland", and the small and scattered pieces of farmland. The paper argues that in spite of this, the program is likely to succeed, and help farmers generate sustainable incomes. The paper is based in four periods of fieldwork in Chongqing Municipality, Shaanxi Province, and Yunnan Province and extensive interviews of farmers and government officers.

Keywords Grain for Green · Reforestation · Migration · China

Introduction

A severe drought in the Yellow River during 1997, and a devastating flood in the Yangtze River basin in 1998, caused tens of billions of Yuan in costs, and thousands of lives. These disasters prompted the government to address the deforestation that had taken place in the Yangtze and Yellow rivers watersheds during the previous decades, and in 1999 the Chinese government started the Grain for Green (GfG) program. The program focused on reforesting farmland and unproductive land, in particular with a slope >25°. The GfG is the largest reforestation program in the world. Between 1999 and 2012, China reforested a total of 24.86 million ha through the GfG, of which 9.06 million ha was former farmland and 15.8 million ha was barren hills and wasteland suitable for forests (SFA 2013). The GfG was implemented among 124 million people or 32 million households in 25 provincial-level administrative units. By the end of 2016,[1] when the program was set to end, the total investment was expected to be no less than 431.8 billion Yuan (US$ 63 billion). The GfG is the largest Payment for Environmental Services in the world, with the largest investment, greatest involvement, and broadest degree of public participation in history.

The GfG had both environmental and socioeconomic objectives. From an environmental perspective, the GfG had the objective of reducing landslides and siltation in the rivers, among others. Hydropower is the second largest source of electricity after coal, and there are plans to expand production (Yang et al. 2016). Lack of forest cover in the watersheds causes much siltation in the dams, and reduces electricity production (Delang 2016). From a socio-economic perspective, the GfG had the goal of raising farmers' incomes, and diversify the local economy by introducing agroforestry and concomitant industries (for example for the transformation of fruits) (Delang and Yuan (2015)).

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[1] In 2016 a new phase of the GfG was introduced.

Fig. 1 China's provincial boundaries. Source: Li et al. (2014)

The GfG program was theoretically based on the voluntary participation of farmers, although many farmers maintain they were forced to join (Bennett 2008). Through the GfG, farmers were paid to convert the land to the original vegetation type, either trees or grass. Trees could be either economic trees (trees from which sustainable incomes can be obtained, for example through the sale of fruits) or ecological trees (which do not give yearly incomes, but can be pruned and potentially logged). At least 80% had to be ecological trees, for the government to pay compensation (Uchida et al. 2005). The government had a list of trees considered economic trees, and a list of ecological trees, and the farmers could only choose among this list. However, in practice the farmers had only a choice among a small number of seedlings available at the local Forestry Office (MOYN 2009). This resulted in little species diversity.

Payments were larger in the Yangtze River watershed than in the Yellow River watershed, but were uniform within each watershed. Payments were initially rather generous, which means that some farmers may have received more than the incomes they received from farming on the same land (Delang and Wang 2013). The government paid the farmers for 5 years for economic trees and 8 years for ecological trees, expecting that after this period farmers would have obtained incomes from the sale of the fruits and/or pruning and would not need additional subsidies. In 2007, the government feared that the farmers would reconvert the land back to agriculture if the subsidies ended, and renewed the period of subsidies (Delang and Wang 2013). However, the government cut the subsidies by half. There are no plans to further extend the subsidies, once they have ended.[2]

In 2015, the Chinese government introduced a new phase of the GfG (hereafter called GfG/2), which is designed and implemented very differently from the first phase (GfG/1). This paper first introduces some of the socioeconomic changes that occurred in the rural areas since the GfG/1 was introduced. These changes are partly due to the economic growth that occurred in China over the last decades, and therefore are exogenous to the GfG, and partly due to the implementation of the first phase of the program. These changes spurred the government to adjust the GfG, and the second phase is now considerably different from the first one. The paper then turns to the GfG/2, and describes its design and the difficulties encountered in its implementation. Finally, I conclude.

This paper is based on four periods of fieldwork: in Chongqing Municipality during June–July 2016 and August 2017, in Shaanxi Province during May 2017, and in Yunnan Province during December 2018–January 2019 (Fig. 1). During these fieldwork periods, with the help of four specially trained research assistants I carried out extensive

[2] Since farmers joined at different times in different provinces, as the GfG gradually expanded nation-wide after 1999, the time the subsidies end varies according to location.

semi-structured interviews with farmers who had—and had not—converted land, as well as staff in three village-level forest offices. Farmers interviewed represent a variety of age, educational background, land holdings, crop production, and wealth. Also, during the June–July 2016 fieldwork I submitted a questionnaire in Pengshui County (Chongqing Municipality) to 81 households (315 people), covering information about income from farming, incomes from GfG, conversion of land, migration, and remittances. Fieldwork information is supplemented by a review of the Chinese-language literature on the second phase of the GfG.

Socioeconomic Transformations in the Rural Areas

Rural areas in the western provinces of China, where the GfG program was implemented, have transformed considerably since the early 2000s. First, from a demographic perspective, the GfG has contributed to considerable changes: most people between 17 and 45 years of age have left the area, either to study or to work, and most of those who remain in the rural areas are either children or older people taking care of children (Li et al. 2014). In Pengshui County (Chongqing Municipality), 73% of those younger than 19 live in their rural villages, while only 21% of those aged 19–64 do so (Delang 2018). The GfG probably contributed to this change, since it withdrew farmland from cultivation (Treacy et al. 2018). However, the conversion of land happened at the same time as the Chinese economy was growing by about 10% a year. Most people interviewed commented that their relatives left because of greater employment opportunities in the Eastern provinces. However, one needs to recognize that the money they received through the GfG for setting aside the land facilitated that migration, as did the network created by the migration of fellow villagers (Fu and Hao 2018).

The second consequence of the GfG worth considering here is that because of the large amount of land converted by the GfG, in many places the land that farmers still own is barely sufficient to sustain those left behind (Zhou et al. 2007; Zhen et al. 2014). Fieldwork data show that in Pengshui County and Shizhu County (Chongqing Municipality), on average 40% of the land (or 47% of the slope land) was converted by the GfG. Based on the requirements calculated by the FAO for a healthy diet, the remaining land can only produce 83% of the local rice needs. The same trend has been observed in many other places in China (Yan 2019). The rice deficit can be supplemented by other food products produced locally, but it is clear that many farmers are only able to survive thanks to local wage work, or remittances from family members who migrated to cities (Gruijters 2018).

The third consequence of the GfG is that incomes from the transformed land (GfG-trees or grassland) are very small, if there are any at all. At least 80% of the trees planted had to be ecological trees, from which incomes could only be obtained from pruning and logging (Xu and Cao 2002). However, China has a logging quota system, whereby farmers have to apply for a permit to cut trees, and the Chinese government gives few permits to farmers (He 2016). Farmers are allowed to cut trees to build their own houses, but these are also strictly controlled, and they cannot cut more than they need. While up to 20% of the trees planted could be economic trees from which yearly, sustainable incomes can be obtained, for example from the sale of fruits, in many cases this did not materialize (Bennett 2008). Fieldwork interviews indicate that there are several potential reasons for this: first, in many cases the local authorities promoted economic trees that were not suitable to the climate or soil of the locality, thus giving little or no fruits; second, often the farmers were not sufficiently trained and did not know how to grow the trees, with the result that the quality of the fruits was too poor to be sold; third, farmers may have marketable fruits, but nobody comes to buy the fruits, and they do not know where to sell them; fourth, the trees may be planted so far from the villages that the limited incomes that may be obtained from the sale of fruits do not warrant the efforts to go harvest them. The result is that most farmers can obtain no—or very low—incomes from economic trees. According to Xie et al. (2015), 70% of households obtain no incomes from the converted land, apart from the subsidies.

The Chinese Government's Dilemma

These transformations in the rural areas, to which the GfG contributed by removing land without providing alternative (local) incomes, has resulted in a drop of working-age population (He and Ye 2014), insufficient farmland for sustenance (Xu et al. 2019), and scant local sources of income (Ward 2016). Démurger et al. (2009), Uchida et al. (2005), Wang et al. (2007), Xu et al. (2006), and Zhou et al. (2007) discuss the drop in agricultural output following GfG-conversion. The same was observed in the counties where fieldwork for this paper was conducted. The remaining farmland is barely sufficient to feed those who remained behind, let alone create incomes sufficient to buy other necessities. This is only sustainable, as long as there are other sources of income which people can use to buy food (Delang 2018). However, perhaps even more importantly, the land available, and incomes obtained from farming, are not sufficient to support those who migrated, if they wanted to return.

The Chinese government faces a dilemma. On the one hand, it has withdrawn too much land from cultivation to allow for return migration. Most of those who work in the construction industry and the labor-intensive export industries are rural migrants (Mohabir et al. 2017). There is much discussion about the Chinese economy overheating, and in particular the housing sector being a bubble, ready to burst (e.g. Liu et al. 2016; Zhao et al. 2017). During times of economic crisis, rural migrants tend to return to the rural areas, where their costs of living are lower, while they wait for the economy to recover (Hausmann and Nedelkoska 2018). If a large number of migrants was forced to return to their villages of origin, rural areas would be flooded with hundreds of millions of people who would no longer have sufficient land for sustenance, while being unable to find other sources of income locally. This fear puts additional pressure on the country's political leaders to continue pursuing economic growth, bail out local governments, and prevent a collapse of the highly indebted developers and the housing bubble (Ang et al. (2016); Yeung 2017). On the other hand, the government still has sloped farmland and wasteland that it wants to reforest, to reduce soil erosion and siltation, and improve water supply (Delang 2017). The second phase of the GfG was designed to address these—perhaps unexpected—consequence of the first phase of the GfG and of the transformations that occurred in the rural areas since the first phase had been designed and implemented.

The Second Phase of the GfG Program

In June 2014, the Chinese government started to plan a new round of the GfG, designed to address some of the problems discussed in the previous section. In September 2014 the plan was distributed to regional governments for comments, and in March 2015 the "Technical Regulation of New Round of Grain for Green" was formulated by the State Forest Administration (SFA). In September 2015, in order to urge the quick implementation of the program, the "Accelerative notification of the implementation of New Round of Grain for Green" was released by five ministries (the National Development and Reform Commission, the Ministry of Finance, the SFA, the Ministry of Agriculture, and the Ministry of Land and Resources (MLR)) (Zhang et al. 2016). The rules of the GfG/2 are as follows.

Selection of the Farmer, Tree Species, and Farmland

In the first GfG, the voluntary participation of the farmers was sometimes only theoretical, with some people forced to convert their land and with little choice of the species of trees to plant (Bennett 2008). The government set a target of at least 80% of ecological trees, and decided specifically what trees species could be planted, or gave farmers a very limited choice (Uchida et al. 2005). In the second phase of the GfG there is no requirement in terms of what kind of trees to plant (whether economic trees, ecological trees, or grasses), or what species to plant. The government only plays an advisory role, advising whether the chosen plant is suitable for the soil and climate (fieldwork information).

On the other hand, the choice of the farmland is more regulated. According to the "General Plan of New Round of Grain for Green", promulgated by the State Council in June 2014, three kinds of farmland take priority for conversion through the GfG/2. The first land that is targeted for conversion is the "Non-basic Farmland" with slopes >25°. According to Jian (2015), Zhang Jianlong (deputy director of the SFA) declared during a press conference in June 2015, "all the farmlands which are above 25° should be converted to forest or grass through the new phase of the GfG program within 5 years". The second national land survey showed that there were 5.496 million ha slope farmlands above 25°, most of which are distributed in western regions (Table 1).

The second land category targeted for conversion is farmland experiencing serious desertification. The third category is "Non-basic Farmland" (between 15° and 25°) in the Three Gorges Reservoir Region, and the Danjiangkou Reservoir area (NMGFGW 2014). The 13th five-year plan of forestry development promulgated by the State Forestry Bureau in May 2016 added a fourth category of land to be converted by the second phase of the GfG: seriously polluted farmland (SFA 2016).

According to the "General Plan of New Round of Grain for Green", from 2014 to 2020, 2.83 million ha of slope farmland and seriously desertified farmland should be converted to forest or grassland, including 1.45 million ha of slope farmland above 25°, 1.13 million ha of sandy farmland, and 250,000 ha of slope farmland between 15° and 25°. Including severely polluted farmland, nationwide the new round of the GfG covers 21.5% of the area of the first round, but in some provinces there are plans to convert a similar amount of land. According to Zhang Yongli, vice director of SFA, the government planned to convert

Table 1 The area of slope farmlands (above 25°) across the country

Regions	Areas (million ha)	Percentage (%)
Northeast regions	0.01	0.2
Southern regions	0.336	6.1
Central regions	0.756	13.8
Western regions	4.394	79.9
Total	5.496	100

Source: MLR (2013)

Table 2 Proportion of "Basic Farmland" with slope above 25°

Province	Shaanxi	Shanxi	Guizhou	Yunnan	Hubei	Chongqing	Sichuan	Gansu
Percentage	81.4%	75.3%	75.2%	70.2%	58.6%	57.4%	44.6%	37.8%

333,000 ha (5 million Mu) in 2014, and achieved that target. For 2015, the government planned to convert 666,000 ha (626,000 ha into forest, 40,000 ha into grassland; Finance. sina 2015), and achieved 78.9% of this target (XinHua Net 2016). In 2016, the plan was to convert 1 million ha (890,000 ha into forest, and 117 ha into grassland; NDRC 2016).

"Convert First, Adjust Later"

A problem with the categories of farmland to be converted is that "Basic farmland" cannot be converted. The Basic Farmland Protection Regulation, passed in 1994, requires the protection of good quality farmland, which cannot be converted to alternative uses (Ding 2004). In theory, "Basic farmland" is the most productive farmland of the country, which needs to be protected to guarantee the national food supply. "Basic farmland" should typically be flat land, since flat land is usually more productive than slope land. However, in reality the land classified as "Basic farmland" is not always flat. Since flat land can be sold at a higher price to developers, in many areas the authorities classified bad quality land with slope above 25° as "Basic farmland", and flat farmland that could potentially be sold for high prices to developers as "Non-basic farmland" (Liu et al. 2016). Xie et al. (2016), show that this happened often in the same provinces in which the government is now trying to promote the new phase of the GfG program (Table 2).

Source: Xie et al. (2016)

Zhang et al. (2016) reported that in Qingzhen County (Guizhou province) over 85% of farmland suitable for GfG/2 was listed as "Basic Farmland". Similarly, in Qianjiang district (Chongqing Municipality) the government plans to convert 13,500 ha of farmland, but only 1700 ha meet the criterion of the GfG/2 and are not classified "Basic Farmland", or used for construction. Furthermore, a large number of slope farmland near important water sources in the Three Gorges Reservoir Region and the Danjiangkou Reservoir area, which would enter in the third category of land targeted for conversion, is also been protected as "Basic farmland". For example, in Zigui County (Hubei province), located in the upper Three Gorges Reservoir Region, there are 2800 ha of farmland above 25°, but 88.55% of them are listed as "Basic Farmland" (Xie et al. 2016).

"Basic farmland" cannot be freely converted by the GfG/2. However, there is a legal process whereby "Basic farmland" can be reclassified into "Non-basic farmland", if it is replaced by other land of similar or greater productivity. Since that legal process is rather lengthy, in some cases counties prefer to "Convert first, adjust later". "Convert first, adjust later" means first converting "Basic farmland" through the GfG/2, and then reclassify them to "Non-basic Farmlands". This process breaks the rule of not converting "Basic farmland" to GfG/2, but since it follows the rule of converting land with high slope, it is sanctioned by the central government. According to Zhang et al. (2016), the "Reform Scheme of Ecological Civilization" promulgated in September, 2015 explicitly declares that land with slope >25° should be removed from the category of "Basic Farmland". SFA (2015) also suggested that the "Basic Farmland" located in barren land far from the county capital, with low crop yields, slope above 15°, and needing large amounts of labor force for cultivation should be converted, because the large number of people who migrated from rural areas, and low incomes available, means that these tracks of land are no longer cultivated.

Guizhou is one of the provinces that implemented the GfG/2 faster and more successfully (Greentimes 2016). It was the first province which completed the task in 2014 and 2015, mainly because of its "Convert first, adjust later" strategy. For example, Bijie City (Guizhou province) had been instructed to convert 15,500 ha in 2014, accounting for 32.86% of the land that Guizhou province had to convert, and 27,200 ha in 2015, 25.3% of the total. Since most of the eligible farmlands was scattered and divided into small pieces, the local government in Bijie City adjusted the "Basic Farmland" above 25° into "Non-basic Farmland" before its application for the adjustment was approved by the MLR. Although the subsidies were not allocated by the central government before the adjustment was approved, the city government had enough funds to temporarily finance the GfG/2 subsidies, until the reclassification was approved. As a result, Bijie City achieved its goals in 2014 and 2015 within the first 6 and 5 months, respectively (Greentimes 2016).

Financial Provisions

The central government allocates the subsidies to provincial governments according to the area converted (NMGFGW 2014). Unlike with the GfG/1, with the GfG/2 the payment standards are unified, which means that there is no longer a distinction between ecological forest and economic forest, or between the Southern and the Northern area (People.com 2014) (Table 3). According to NDRC (2016), the standards

Table 3 Payment of three stages in GfG, per mu[a]

GfG phase	Implementation phase	Year of promulgation	Southern region	Northern region
GfG phase 1	Stage 1	2002	Grains: 150 kg/(mu·a) Living allowance: 20 Yuan/(mu·a) Seedlings: 50 Yuan/mu	Grains: 100 kg/(mu·a) Living allowance: 20 Yuan/(mu·a) Seedlings: 50 Yuan/mu
			Converted into[b]: 280 Yuan/(mu·a) Converted into[c]: 235 Yuan/(mu·a)	Converted into[b]: 210 Yuan/(mu·a) Converted into[c]: 180 Yuan/(mu·a)
	Stage 2	2007	Cash: 105 Yuan/(mu·a) Living allowance: 20 Yuan/(mu·a)	Cash: 70 Yuan/(mu·a) Living allowance: 20 Yuan/(mu·a)
			Total: 125 Yuan/(mu·a)	Total: 90 Yuan/(mu·a)
GfG phase 2	Stage 3	2014	1500 Yuan/mu for 5 years Equal to: 300 Yuan/(mu·a)	

[a]Notes: 15 mu = 1 ha

[b]Calculated by state council: the price for grains was 1.4 Yuan/kg

[c]The average market value for grains was 1.1 Yuan/kg in 1999

Source: Li and Shi (2015)

are unified because farmers in the South obtain higher profits from farming activities but the cost of afforestation is lower, while farmers in the north are in the opposite situation. However, Li and Shi (2015) argued that though unified standards help to reduce the cost of implementation, the payments are considerably lower than the potential incomes from wheat or grain production, with the opportunity cost of the Southern grain producers being double those of the Northern wheat producers.

The subsidy for converting the farmland into forestland is 1500 Yuan/Mu over 5 years, divided as follows (People.com 2014; NMGFGW 2014):

First year: 800 Yuan/Mu (including 300 Yuan for the seedlings)
Third year: 300 Yuan/Mu
Fifth year: 400 Yuan/Mu

The subsidy for converting the farmland into grassland is 800 Yuan/Mu (in 2014), divided as follows (People.com 2014; NMGFGW 2014):

First year: 500 Yuan/Mu (including 120 Yuan for the seedlings)
Third year: 300 Yuan/Mu

In order to expand the scale of the GFG/2, in June of 2016 the subsidy for converting farmland into grassland increased from 800 Yuan/Mu in 2014 to 1000 Yuan/Mu in 2016 (MEP 2016):

First year: 600 Yuan/Mu (including 150 Yuan for the seedlings)
Third year: 400 Yuan/Mu

According to the "General Plan for the New Round of the Grain for Green", the central government has invested a total of Yuan 12 billion to convert 1 million ha of farmland in 2014 and 2015 (ZGFZJD 2015), including Yuan 4.5 billion as subsidies for seedlings, and Yuan 7.5 billion as direct payments to farmers (ZGFZJD 2015) (Yuan 2.5 billion in 2014, and Yuan 5 billion in 2015; Finance.sina 2015). However, according to SFA (2015), the actual amount of money received by local governments was of only Yuan 429.92 million, or Yuan 13.03 million per county.

Land Tenureship and Labor Arrangement

One of the problems with the GfG/1 was that the land was converted at the individual household level, with no pooling of resources. The fact that 80% of the land had to be covered with ecological trees, which precluded the possibility of profits, was a disincentive to pool resources and inhibited investors' interests. With the GfG/2, since the government is trying to increase the incomes available to farmers, and farmers are able to choose economic trees, the government is trying to encourage investors to get involved and create large scale plantations. Three kinds of arrangements are possible:

(1) An enterprising farmer may lease land adjoining his own land. For example, Jiang Huaibei, a farmer from Fenghuang village (Gansu province), converted a total of 3.5 ha of farmland, over 90% of which was rented from eight small households. He received the compensation from GfG/2, and paid the Land transfer fee to these eight households (SFA 2015).

(2) Several farmers would get together and create a cooperative (Cooperative + Household). This cooperative

would include the land of all the farmers, and perhaps also land leased from other farmers. The Forestry Office would help the cooperative borrow money from the bank (SFA 2015; fieldwork information).

(3) An investor leases land from a number of farmers (Company + Household), which perhaps are organized in a cooperative (Company + Cooperative + Household). The local Forestry Office would typically help the investor find the farmers and borrow the money from the bank, but would not be involved in selecting the fruits to be planted. With this arrangement, often the company employs the farmers to work the land, for a wage. An alternative arrangement is for the farmers to rent the land to the investors and not be involved in the work on the farm. This way farmers are free to migrate elsewhere, but still obtain an income. This arrangement is particularly suitable to those households whose most productive men and women have left the farm. The income allows those who stayed behind to support their livelihood, and in case the migrants return, the returnees would obtain a small income (SFA 2015; fieldwork information).

SFA (2015, p. 90) argued that this new method of land conversion not only aroused the interests of rich households and cooperatives to invest, but also made it easier to implement GfG/2, because small and scattered pieces of land can be integrated together and be managed by professional operators. SFA (2015) found that households with relatively abundant land resources, tend to become involved in the second round of the GfG as investors. On the other hand, in villages with fewer land resources, many farmers have small pieces of farmlands to be converted, and prefer to cooperate with a company, or join forces in a cooperative by way of assignment, lease or shares (SFA 2015, p. 82). For example, in Zhuxi county (Hubei province), since 2014 there have been 53 private investors, converting 3300 ha of barren hills or slope farmlands owned by 25,000 households (SFA 2015, p. 82).

Fu (2016) argued that in the new management mode of "Company + Cooperative + Household", the company provides investment and technical guidance, farmers supply their lands and labor, and the cooperative is a bridge between the company and farmers, helping farmers to bargain with the company. Fu (2016) provides the example of the cultivation of Sumac in Enshi city (Hubei province) through a company + cooperative + household arrangement. The earning period of sumac is 6–9 years, farmers receive 400 Yuan/mu each year through subsidies and labor remuneration in cooperatives during the first 5 years. After that, farmers receive 30% of the profits of raw lacquer and are paid for their labor input, the company retains 60% of the profits, and the cooperative receives 10% of the profits. However, one problem is that China is still in its early stages of the organization of cooperatives, which means that farmers are unfamiliar with their rights and obligations, and there is a lack of regulations. The lack of experience of farmers means that the companies are able to depress the purchasing price, and obtain a larger share of the profits. Farmers may even lose control of the cooperatives (SFA 2015, p. 90).

Problems and Difficulties with the Second Phase of the GfG

Zhang et al. (2016) surveyed farmers and forest office staff, and identified seven major problems affecting the implementation of GfG/2 (Fig. 2). In the following pages I discuss the four more important problems.

Low Level of Subsidies

The biggest problem affecting the implementation of the GfG/2 is the low level of subsidies available to farmers. Although in terms of the annual subsidies, the payments are

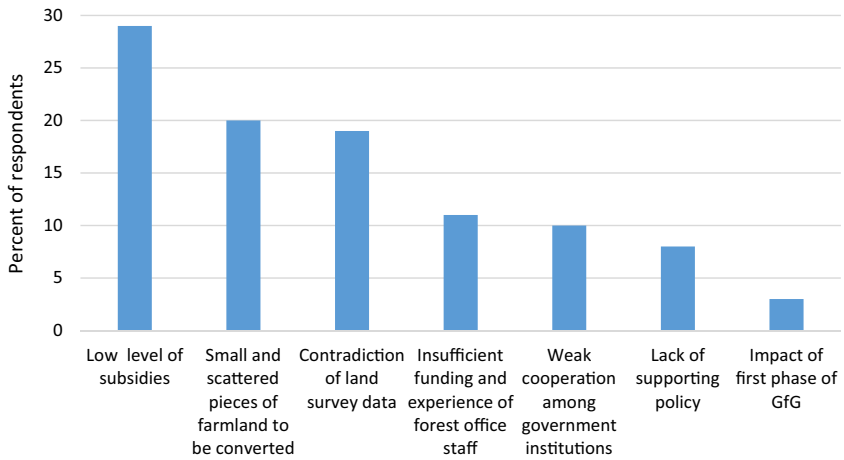

Fig. 2 Main problems of the GfG/2. Source: Zhang et al. (2016)

higher than those of the GfG 1, there has been considerable inflation during the years since the GfG/1 was implemented, both in terms of the price of food and salaries. During the last decade, the Consumer Price Index of farmers increased by 45.5%. Also, the annual allowance for agricultural land can be almost as high as the subsidies from the GfG/2: in Chongqing Municipality, the annual allowance for agricultural land is 110–150 Yuan/mu for small areas, and 200–240 Yuan/mu for larger areas (Zhang et al. 2016). Furthermore, the payment for the requisition of farmland is higher (in Guizhou province more than twice as high) than that for the requisition of forestland. Farmers have interest in converting forestland to farmland and back to forestland to maximize subsidies (Zhang et al. 2016).

The low level of subsidies reduces farmers' motivation to participate in the GfG/2. Zhang et al. (2016) found that 80% of farmers in Jingchuan County (Sichuan province) thought that the payments were too low. Similarly, according to SFA (2015), 61.1% of sampled households thought the subsidies were low, and 25% thought that this level was unacceptable. Duo and Li (2015) also found that in Inner Mongolia farmers were able to obtain almost double as high incomes from naked oat than they would have from GfG/2 economic trees, although this difference was partly due to the region not being suitable for economic trees because of its poor natural environment.

In addition, with the improvement of farmers' economic conditions, partly due to remittances and off-farm employment in local cities, the payment from the GfG/2 would contribute little to their incomes. For example, in Ziyang county (Shaanxi province), the payoff of GfG/1 accounted for 10% of the total amount of farmers' income, while the estimated payoff of GfG/2 would make up <5% of their income (Zhang et al. 2016).

Farmers also expressed concern about the short allowance period, especially in the barren land like the Karst region in Chongqing, Sichuan, Hunan, Guangxi, and Guizhou (Zhang et al. 2016). It takes >5 years for most tree species to become productive, from the time the seedlings are planted. During these 5 years, farmers obtain subsidies. However, if farmers cannot make profits with the economic trees after the subsidies end, there is a risk that they cut the trees and revert the land to farming.

Finally, although farmers have the rights to choose the plant species in the new phase of the GfG, the amount of subsidies available to purchase the seedlings is insufficient. For example, in Zigui county (Hubei Province), most farmers want to choose walnut trees and tea trees, whose seedlings cost 429 Yuan/mu and 1400 Yuan/mu, respectively. This is much more than the subsidies for seedlings (300 Yuan/mu). Furthermore, as most of the suitable land has been converted by the GfG/1, the quality of the remaining land is either too poor to grow healthy trees, or too good and used for agricultural crops, which generates higher incomes. Zhang et al. (2016) report that in Gansu province the minimum cost of planting trees on the poor land is of 800 Yuan/mu, which means that the farmer has to go into debt to convert the land.

Small and Scattered Pieces of Farmland to be Converted

Due to the broad implementation of GfG/1, the farmland suitable for GfG/2 tends to be dispersed in small plots. For example, in 2014 households converted fields of an average of 0.164 ha in Gongxian County (Sichuan province), 0.145 ha in Yongshun County (Hunan province), and 80% of converted land was <0.67 ha in Qingzhen County (Guizhou province) (Xie et al. 2016). Under these conditions, it is hard to have economies of scale that may reduce costs and make the conversion more profitable. SFA (2015) claims that the newly rehabilitated lands in the southern regions are more scattered than those in the north. For example, two peasant households in Xupu County (Hunan province) have 0.4 ha of rehabilitated lands, but these lands are divided into 16 pieces, making each piece <0.027 ha (SFA 2015). According to Zhang et al. (2016), fields can be as small as 0.0073 ha.

The small and scattered pieces of converted land not only increase costs and decrease work efficiency, but are also ineffective to prevent water and soil erosion, or to improve the ecological environment. Besides, when land is distributed in isolated regions with poor natural conditions, there are high cost of implementation and management, and little potential contribution to farmers' standards of living (Zhang et al. 2016).

Contradictions of Land Survey Data

The MLR produced land cover maps during the second national land survey, which ended before 2010. However, as mentioned above these maps do not always reflect the reality on the ground: some land that could potentially be converted through the GfG/2 cannot be included, because the maps consider it already forested. On the other hand, some land included as farmland in the maps may already have been converted by the GfG/1. For example, 68% of farmers who were willing to convert their lands in Dongchuan city (Yunnan province) were not allowed to do so (Zhang et al. 2016). On the other hand, while according to MLR maps over 233 ha of land in Xunchang village (Sichuan province) were "non-basic farmland" above 25°, much of that land had already been converted by the GfG/1, and only 60 ha remained to be converted (SFA 2015).

Insufficient Funding and Experience of Forest Office Staff

According to Xie et al. (2016), many local governments expressed concerns about the insufficient working allowance and experience of their staff. Xie et al. (2016) calculated the expenses of the Forestry offices that implement the GfG/2 in Chongqing Municipality, and concluded that the costs amount to 240 Yuan/ha for the first year, and 90 Yuan/(ha·a) for the next 4 years, for a total of 600 Yuan/ha for 5 years. On the other hand, the central government funds only 54 Yuan/ha. Although the Municipality provides a further 372 Yuan/ha in subsidies, there is still a deficit of 171 Yuan/ha.

In addition, Forestry Offices are understaffed. For example, according to Li et al. (2015) there are usually only less than four workers in the village-level forestry offices in Guangxi. To make up the vacancy of technicians, some stations employ township cadres who are unfamiliar with forestry and lack the skills necessary for a successful implementation of the GfG/2, which results in its slow and inefficient implementation (Li et al. 2015).

Conclusions

This paper introduced the second phase of the GfG: the reasons for the government to introduce a new phase, the differences between the first and second phases, the rationale for such differences, and the difficulties and constraints in the implementation. Fieldwork interviews indicate that most farmers believe the GfG is one of the most successful programs of the Chinese government in rural areas, with considerable economic and ecological benefits. It is difficult to differentiate the impacts of the GfG to that of other rural development programs, and of the rapid nationwide economic growth, but it is clear that the GfG contributed to the changes that have taken place in China's rural areas. In particular, the GfG contributed to a reduction in agricultural land, and in the ability of farmers to grow sufficient food for sustenance. This is presently not a problem, since most people in working age (between 17 and 50 years old) left the rural areas. But it can be a problem if the migrants are forced to return by an economic crisis. At the same time, the new conditions in the countryside—less land to be converted, a smaller local workforce, and the need to generate incomes for possible returnees—forced the government to reform the GfG. It is very likely that the GfG/2 will be more successful than the GfG/1. The main criticism levelled on the GfG/1 was the lack of incomes that it generated for farmers, beyond government subsidies. The GfG/2 is designed to generate sustainable incomes, and with sufficient flexibility to be adjustable to local conditions—areas with a labor surplus or a labor shortage, and with sufficient or insufficient capital.

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Compliance with Ethical Standards

Conflict of Interest The author declares that he has no conflict of interest.

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