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Farmer's Professional Associations in Rural China: State Dominated or New State-Society Partnerships?

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Two decades of economic reform have changed the economic landscape of China. Per capita grain output has reached developed country levels; many farmers shifted into higher valued crops, making decisions increasingly on market-oriented principles; the research system has helped push up productivity by almost double the rate of population growth, and the nation has by far the most sophisticated agricultural biotechnology program in the developing world—indeed many of its breakthroughs are of global importance (Huang et al, 2002). Rising food exports demonstrate that China's farmers are now able to compete in international markets. Off the farm, more than 40 percent of rural residents have employment; and about 100 million of them have moved to urban areas for employment (deBrauw et al., 2002). Rural incomes have risen dramatically and hundreds of million of people have escaped poverty during this time (World Bank, 2001). Growth in agriculture, non-farm employment and rural industry and the transformation of domestic and international markets have changed the face of rural China and are playing key roles in the nation's modernization.

While the new landscape should fill leaders with optimism, there are still great challenges ahead. With the transition from planning in the rural economy mostly complete, China's main challenge has shifted to one of development (Nyberg and Rozelle, 1999). In China's new environment the main metric of success will be the extent to which the rural economy can become an integral part of the nation's push towards modernization. For China to successfully modernize, the nation's economy will

have to experience a fundamental transformation—from rural to urban and from agriculture to industry and services.

To effect such a transformation, one of the main challenges of the reformers relies on a shift in the role of the state and development of new partnerships with citizen groups to carry out efficient and equitable growth (World Bank, 2003). Although the Government moves out of the direct provision of many goods and services, it needs to be redirected to providing public goods, overcoming market failure and providing useful services that the private sector is unlikely to find profitable. To effect these changes, the main task of leaders is to comprehensively redefine the role of government and make explicit to various levels of governments, bureaus and individual leaders what they should and should not be doing. Also, as the government gets of direct production, it will be in a better position to create, implement and coordinate policies that involve conflicting goals. An example is the poverty alleviation policy to raise livestock (goats, sheep) in unsuitable areas resulting in serious environmental damage. Some sub-national governments have taken drastic but effective measures to manage natural resources while still helping the poor, but others need better guidance.

In a modern society which is dominated by markets and assets and information are mostly in the hands of private individuals and enterprises, the government needs partners to carry out its tasks (Trewin, 2003). As such it is important at this point of its development that China begins to encourage the development of truly independent non-state organization, including those organizations that will act as information networks, business support groups, marketing systems and credit cooperatives. In looking at the experience of Japan, Korea and Taiwan, the rural economy in China is in need of the

emergence of active and strong Farmer's Professional Association (FPAs) to help the rural population carry out a number of the productive and consumption-oriented activities that are needed for rapid growth.

Surprisingly, although the role of FPAs in rural China is beginning to be discussed again in academic and policy making circles, such institutions in China are still relatively low profile and little is known about them. It has been stated that there are more than 100,000 farmer associations in China (World Bank, 2003). The Ministry of Agriculture claims that the current association includes 4 to 5 percent of all farmers (Zhou, 2003). The source of these numbers, however, is unclear. Any numbers that are reported also have to be treated with caution since the structure of most is still ill-defined and there are no standards on which reports from FPAs are based..

To overcome the absence of information on such a key part of China's future development process, the main goal of our paper is to report on the results of a survey designed to provide a picture of the current status of FPAs in China. In the report we will have three objectives. First, we try to establish a baseline of the size of the FPA movement in China, its rate of growth and the scope of their activities. Second, we identify when, where and what FPAs are emerging, examining our data by province, by income category and by several other indicators. Finally, we seek to find what factors are inducing the emergence of FPAs.

Data

At the heart of our analysis is our data set. We use a unique set of data on the institutions and development investments in rural China collected by the authors in 2003.

The authors and several Chinese and foreign collaborators designed the sampling procedure and final survey instrument with the village as the unit of analysis. The field work team, made up of the three authors and 30 graduate students and research fellows from Chinese and North American educational institutions (all with PRC citizenship and an average education level higher than a masters degree), chose the sample and implemented the survey in 6 provinces and 36 counties in a nearly nationally representative sample. The sample provinces were each randomly selected from each of China's major agro-ecological zones.[1]

The sample villages were selected by a process that the survey teams implemented uniformly in each of the sample provinces. Six counties were selected from each province, two from each tercile of a list of counties arranged in descending order of gross value of industrial output (GVIO). GVIO was used on the basis of the conclusions of Rozelle (1996) that GVIO is one of the best predictors of standard of living and development potential and is often more reliable than net rural per capita income. Within each county, we also chose six townships, following the same procedure as the county selection. When our enumerator teams visited each of the 216 townships (6 provinces x 6 counties x 6 townships) officials asked each village to send two representatives (typically the village leader and accountant) to a meeting in the township. On average, enumerators

[1] The sample villages come from six representative provinces. Jiangsu represents the eastern coastal areas (Jiangsu, Shandong; Shanhai, Zhejiang, Fujian and Guangdong); Sichuan represents the southwestern provinces (Sichuan, Guizhou and Yunnan) plus Guangxi; Shaanxi represents the provinces on the Loess Plateau (Shaanxi and Shanxi) and neighboring Inner Mongolia; Gansu represents the rest of the provinces in the northwest (Gansu, Ningxia; Qinghai and Xinjiang); Hebei represents the north and central provinces (Hebei; Henan; Anhui; Hubei; Jiangxi; and Hunan); and Jilin represents the northeastern provinces (Jilin, Liaoning and Heilongjiang). While we recognize that we have deviated from the standard definition of China's agoecological zones, the realities of survey work justified our compromises. Pretests in Guangdong demonstrated that data collection was extraordinarily expensive and the attrition rate high. One of our funding agencies demanded that we choose at least two provinces in the northwest. Our budget did not allow us to add another central province (e.g., Hunan or Hubei) to the sample.

surveyed around 11 villages in each township. The number of villages per township ranged from 2 to 29.[2]

After answering questions about the economic, political and demographic conditions of their villages in 1997 and 2003, the respondents answered a set of 25 questions about the activities of FPAs (if there were any) that were operating in or around their villages. The questionnaire was designed to elicit information about the size of the association, its coverage, its main functions, information about its charter, registration rules and internal organization. The survey also included a section that attempted to understand how the actions of government agencies affected the start up of the associations.

Farmer's Professional Associations in China

To meet our first objective, in this section we will examine the number of villages that report to have any sort of FPA, regardless of the characteristics. We then will use information to identify those FPAs that have met a number of criteria (e.g., having a certification or being officially chartered) that are thought to typically define a *formal association*. We also will identify those FPAs that have characteristics (e.g., they are not registered as a commercial entity at the Market Administration Bureau or those associations in which government officials do not have decision making authority) that

[2] On average, the attrition rate was only 6 percent. In no case, did we leave a township until at least 80 percent of the villages had been enumerated. In order to examine if the villages that were not enumerated (due to attrition) were systematically different from those that participated, we collected a set of variables about no-show villages from the township and ran a probit regression with the dependent variable represented as an indicator variable where the variable equaled one if the village did not come and zero otherwise. There were no variables that were significant. If a village had more than 25 villages, we randomly selected 25 of them. This only affected less than 5 townships.

make them appear to be a *functional association*. In most of the report, we will examine the nature of FPAs according to both of these definitions.

When leaders from the 2459 sample villages were asked the *unqualified* question, "Are any farmers in your village currently participating in an FPA?" only a small fraction of the respondents responded affirmatively. According to our data, 251 villages reported that their farmers participated in some form of FPA. Since some villages had farmers in more than one FPA (2 village reported activity in 4 FPAs; 3 villages reported activity in 3 FPAs; 23 village reported activity in 2 villages), in total during the course of our survey enumerators discovered 290 FPAs were at least present in the sample villages.

Although the sample size was relatively small (only 0.35 percent of China's villages), with a number of assumptions the random nature of our sample allows us to make an estimate of total FPA activity in China. If it is assumed that all villages have equal probability of being observed and are of equal size, our survey finds that 10.21 percent (250/2459) of China's villages have FPAs (not shown in Table 1). When we account for the probability of observing each of our villages according to their population proportion (that is weighting our descriptive statistics by the sizes of the population of township, county and region of each observation), our survey finds that 10.21 percent of China's villages have FPAs (Table 1, column 1, row 1). Using the weighted statistics (*as we do in the rest of the report*) and extrapolating from our sample to the rest of China, we estimate by about 75 thousand villages at least nominally have FPAs (row 2). Moreover, according to our data on average 28.5% of the households in each village is part of the village's FPA. Hence, our data suggest that about 2.91 of China's farm households, or about 6.93 million households, nominally have an association with an FPA (rows 3 and

4). Interestingly, these numbers of unqualified FPAs are surprisingly close to the figures reported by the Ministry of Agriculture which has reported during various speeches and interviews that about 100,000 villages had FPAs, which includes 4 to 5 percent of China's households. In short, although as a percentage of all of villages only a small share of China's village have FPAs, but in total we do find that there is a large absolute level of FPA activity in China.

When more carefully categorizing the reported FPAs into those that follow more *formal* rules (without regard to how they function); those that *function* according to standard definitions of associations (as opposed to commercial units or government programs); and those that are only nominally FPAs (or those that are merely FPAs in name), we produce what we believe are more informative estimates of FPA activity in China. In the FPA block of the survey, we included two sections of questions designed to understand how FPAs operate. The first set included four questions that measure the formality of FPAs. Specifically, we asked: a.) if the FPA was formally registered (and where); b.) if the FPA had a written charter; c.) if there was a process by which individuals established their formal membership; and d.) if participants were required to pay dues or an annual membership fee. Although somewhat ad hoc, we decided to designate those associations that had two or more of the characteristics as *formal FPAs*.

Using our information on FPA formality, we find that most, but not all, FPAs follow internationally established procedures and can be counted at formal FPAs (Table 2). For example, 74 percent of FPAs formally register with one of several government bureaus (row 1). Slightly more (82 percent) have written charters, which typically are documents that specify the rules and regulations governing FPA activities (row 3). A bit

less than three-quarters (72 percent—although not exactly the same FPAs) have procedures in which they admit formal members (row 2). In these villages members must fill out an application and membership is not automatically conveyed on them merely because they are in the village. Finally, some FPAs, though a much lower proportion (14 percent) have annual membership fee requirements that mandate that active members pay dues to the FPA. By examining the presence or absence of the formality characteristics in the sample FPAs, we find that 2 percent have zero of the four formality characteristics and 15 percent (cumulative) of reported FPAs have only one or zero (rows 5 and 6). The rest or 84 percent of FPAs (33+41+10) meet at least two of the formality criteria and are counted as formal FPAs.[3] According to the formality criteria, in total there were 233 FPAs, which would mean that there are 7.49 percent of China's villages with formal FPAs (Table 1, column 2, row 1). Moreover, according to our assumptions, about 55 thousand villages and 1.76 percent of China's farm households, or 4.19 million households, are in formal FPAs (Table 1, column 2, rows 2 to 4).

It is interesting that such a small number of FPAs have annual membership fee requirements (as seen above, only 14%). In interviews we were often told that fewer farmers would join if there was a required annual membership fee. Instead, we find that in most FPAs there are assessments that are made which fund the expenses of the association. Instead of annual fees, they are usually collected for a specific purpose right at the time the service is being provided. In this way, the leaders of FPAs have told us they spend a lot of time in organizing even relatively small scale activities.

In our data we also collected detailed information on the operation of the sample FPAs in order to establish how many were truly *functioning FPAs*. The main idea was to

[3] It should be noted through out the paper that in many case numbers do not add to 100 due to rounding.

remove from the list of total reported FPAs three types of so-called association: a.) entities that were operating as (or nearly as) a commercial firms; b.) those that were (or nearly were) empty shells; and c.) organizations that, in fact, are leader-organized / leader-run development projects. In other words, we are trying to generate an estimated count of those FPAs that are really behaving as organizations that are representing the interests of farmers, primarily through the participation of farmers. In order to establish whether or not an FPA was functioning or not, the survey asked farmers three questions.[4] First, we asked whether or not the association was registered with the Market Administration Bureau. If so, we assume that the organization was a commercial entity and not a functioning FPA. Second, the questionnaire included a question about whether or not the primary function of the organization was to operate a commercial enterprise. If so, we assume this is not a functioning FPA. Finally, we asked whether or not a township or village official made all of the decisions for the organization. If so, we assume that the reported FPA was not a functioning one. In other words, if the reported FPA was not registered with the Market Administration Bureau *and* if the primary activity of the FPA was not running a commercial enterprise *and* if the government officials did not hold monopoly power over the decision making authority with regards to FPA matters, we assume the FPA was a functioning FPA.

In the same way that most (but not all) FPAs are formal, it also is true that most, but not all FPAs are functioning (Table 2, rows 10 to 17). For example, only 6 percent of FPAs registered with the Market Administration Bureau (column 2, row 10). Clearly,

[4] We also asked a fourth question that would have made the criteria for being a functioning FPA even more stringent. We asked if the FPA made major decisions according to a one-household / one-vote principal. In asking such a question we were trying to understand if FPAs were being dominated by 1 or more individuals--

from this criterion, only a small number of FPAs are excluded from the functioning FPA list. Likewise, only a small percentage of FPAs (19 percent) consider their main activity to be running a commercial firm. We believe that many of the FPAs that report their primary activity to be the operation of a commercial firm, in fact, are firms that for a variety of reasons (e.g., tax benefits; or lending priorities) set themselves up nominally as an association. Finally, in 10 percent of FPAs the respondents reported that a government official made all decisions for the operations of the FPA. When taken together, we find that 31 percent of FPAs, according to our criteria, are not functional; 69 percent are. In other words, although some FPAs are, in fact, either commercial entities or government-run organizations, most are not. In our entire sample, we find 194 villages with functional FPAs, a figure that implies that 7.50 percent of China's villages, or 55 thousand, have functioning FPAs. In these functioning FPAs, we also estimate that about 2.08 percent of China's households (or about 4.95 million) participate in FPAs. Such numbers, while large in absolute terms, still only represent a small fraction of China's rural households. Moreover, the estimates of functional FPAs are considerably below estimates routinely used by the MOA.

It should be noted that we did not eliminate FPAs from the functioning list if village leaders were the leader or director of the association. In fact, during our field work, we observed that in almost 67% of FPAs the leaders was a village cadre. In our view, leaders in many villages will naturally gravitate to the role of leader and it is really the extent to which leaders dominate decision making (which is a criteria), not their position, that distinguishes a functioning FPA from a non-functioning one.

While the discussion of formal and functional might suggest that there should be consider overlap, since an association that followed the rules in setting itself up might be expected to also function better, our data show that while there is considerable intersection, there are a number of systematic aberrations (Table 3). Only about half of the sample FPAs (54 percent) is both formal and functional (column 2, row 2). The other half shows that being formal does not imply functionality and vice versa (rows 1 and 2). Specifically, most of the FPAs (81 out of 87) that are not functional (that is, they operate like a commercial enterprise or a government-led development project) are formal (that is, they followed the rules for registration and chartering quite closely). Likewise, most informal FPAs are functional (42 out of 48). While the current data set is not designed to definitively answer the question why this might be the case, it is possible that although government officials and opportunistic entrepreneurs may be willing to invest the time and resources to set up an organization that will meet the formal requirements for an association, such an effort does not always end up in promoting well functioning FPAs. In fact, informal FPAs do quite well in terms of functionality.

The Emergence of FPAs in China: When, Where and What

In this section we use our data to try to paint a picture of role that FPAs are playing in China and where they are appearing. To do so, we first examine when FPAs emerged in China. Next we will examine where they are most prevalent and where they are conspicuously absent. In particular, we will examine the incidence of FPAs by province, by distance from China's metropolitan cities and by income categories. Finally, we briefly survey what activities they are engaged in.

When. When examining the emergence of FPAs, there are three fairly distinct time periods: the early reform era; the mid-1990s; and the recent years (Table 4). The early reform period was one of almost no systematic activity in terms of FPAs. In our sample of more 2000 villages, only 14 villages saw any FPA activity before 1994 (rows 1 to 6). During the first half of the reform era, only 5 percent of all of the post-reform FPAs emerged (column 2). Moreover, the activity appears to be relatively idiosyncratic. For example, the earliest FPA (in 1980) in our sample was an association created by farmers growing nursery plants in Li Xian, the poorest county in Gansu Province (the poorest province in our sample). In 1986, the next FPA, a garlic growing association, emerged in Dafeng County, a middle income county in Jiangsu Province (the richest province in our sample). The rest of the 10 FPAs that emerged between 1990 and 1993 were scattered throughout Jilin, Hebei and Sichuan Provinces. In short, before the mid-1990s there was almost no FPAs in China and when they did arise, they appear literally all over the map.

In the mid 1990s, however, just at the time that fruit and vegetable production began to expand rapidly in China, there was a noticeable rise in FPA activity (Table 2, rows 7 to 10). Between 1994 and 1997, on average, about 8 to 9 new FPAs emerged each year. While the total rise of FPAs only accounts for 11 percent of the total increase in the reform era, it is perhaps notable that it was occurring at all given the focus of China's government at this time on grain fundamentalism.

The fastest expanding period of FPAs has occurred during the past 5 years. Villages started fully 84 percent of all FPAs since 1998. On average, nearly 40 FPAs per year were started in our sample villages during the recent 6 year period, a time in which

the government certainly was giving farmers mixed signals: promoting structural adjustment on one hand, while beginning a period of a subsidizing staple grains on the other. In other words, during the past five year there has been a noticeable acceleration in activity; indeed if the accelerating trend were to continue, there is no doubt that FPAs would begin to become a more formidable and widespread institution.

When asked why there were so few new FPAs in 2003, selected respondents that we contacted since the survey reminded us that most local and regional initiatives had been put on hold in 2003 because of the SARS epidemic. In informal discussions with many of the village leaders that were responding, we were told that local leaders had an impression that there is increasing demand for such organizations. If so, then, it is possible that we are only seeing the earliest indications that there is rising interests in FPAs.

Where. According to our data we find that all of the sample provinces have FPAs, though some have more than others. When weighting by provincial populations (instead of regional populations as we do in the rest of the paper), we find that Sichuan province has the most FPAs (Table 5, columns 2 to 4). No matter if we are examining total number of reported FPAs (32 percent), formal FPAs (35 percent) or functional FPAs (35 percent), Sichuan ranks first in terms of number of associations. It should be cautioned, however, that the main reason that Sichuan has the most FPAs is due to the size of its population. Sichuan also has the largest population share of any of the sample provinces (column 1). When considering this, then, Sichuan actually is about average when it comes to FPA participation. The share of FPAs is almost the same as its population share.

The provincial level data also can show us which provinces are relatively intensive in their FPA activity and which ones are less intensive (Table 5). Shaanxi and Hebei provinces both have report, formal and functional FPA participation rates above their population weights. For example, the rural population in Shaanxi accounts for only 11 percent of the population of the six sample provinces, but accounts for 18 to 21 percent of the FPA villages. In contrast, Jiangsu has fewer villages with FPAs than its population share. Such variations mean that the ranking of provinces in terms of their intensity of participation (Sichuan, Hebei, Shaanxi, Jiangsu, Gansu and Jilin) differs from the ranking based on populations weights (Sichuan, Hebei, Jiangsu, Shaanxi, Gansu and Jilin).

The results change somewhat, however, when we use the provincial data as proxies for regional data by extrapolating the estimates to provinces with similar characteristics elsewhere in China (for details and assumptions, see footnote 1). In Table 5 (columns 5 to 8), we show the regional population weights of the six regions (column 5) and the population weighted estimates for the total number of FPAs and the numbers of formal and functional FPAs. The main difference in the results occurs in the ranking of the first and second provinces. In contrast to the results when weighted by provincial populations, in all of the series (total, formal and functional—columns 6, 7 and 8) our sample survey suggests that most of China's FPAs are in the central region of the country (provinces that we assume are similar to Hebei, such as Henan, Hubei, etc.). Moreover, in all cases, the share of FPAs (38 to 55 percent) is larger than its population share (33 percent). Hence, according to the data based on these rankings, the Hebei region ranks first, higher than the ranking of Hebei province (ranking was 2nd) when only the

provincial weights were used. Sichuan drops to the second ranking for all measures, and its FPA participation rates are far below the Sichuan region population weight. The rest of the regional-weighted participation rankings (#3—Jiangsu; #4—Shaanxi; #5—Gansu; #6—Jilin) are similar to the provincial-weighted ones.

Although our data are fairly well distributed across provinces (with certain exceptions as noted above), when examining our FPA participation data by county, we find that there appears to be a significant amount of clustering that occurs at the county level (Table 6). For example, there are three counties (8 percent of the sample counties) that have no FPAs at all (column 1) and 21 counties (58 percent) that have only 79 FPAs (27 percent—column 2). In contrast, in 12 sample counties, we find 211 FPAs (column 3). In other words, one third of the counties hosts nearly three quarters (73 percent) of the FPAs. While we have not pinpointed the reason for such clustering—it is possible that it is due to either local policy effort or because some regions have higher demands for the services of FPAs—a finding is still of interest and would be important to those wanting to study or work with FPAs.

When examining the location of FPAs along a rich region/poor area spectrum, we find that there are consistent non-linear patterns that occur with examining total reported FPAs, formal FPAs and functional FPAs (Table 7). For example, in the case of functioning FPAs, villages in the poorest quartile have formed 21 percent of the associations (column 3). The FPA participation rate, however, falls to 15 percent for the second quartile (the lower, middle income category). As villages move into the third and highest income quartiles villages again become more likely to participate. Indeed, villages in the richest one-quarter of our sample have formed 40 percent of the

functioning FPAs. While the results suggest that households in better off villages have a higher propensity to being functioning FPAs, those in poor ones also do. Interestingly, although as we saw above there is considerable difference between the cohort of villages that have formed functioning FPAs and those that have formal FPAs, the pattern across income space is fairly similar.

An even more distinct, although still somewhat non-linear, pattern appears when examining the location of FPAs in relation to China's main economic centers (Table 8).[5] When examining the villages in the most remote quartile (i.e., the 25 percent of the villages that are in counties at least 460 kilometers away from an economic center), we find little FPA activity of any kind (row 2). For example, only 5 percent of functioning FPAs are in the most remote quartile. In contrast, 59 percent of functioning FPAs are in the quartile of villages closest to China's main economic centers. If functioning FPAs are providing technological and marketing services for farmers that are seeking to interact with institutions that are emerging with the rise of China's agricultural marketing system, our data shows that either leaders or farm households (or both) are more willing to start FPAs in regions that are closer to China's large centers of economic demand. According to Fulton (2004) such patterns of FPAs with respect to income and proximity to a metropolitan region are unique; cooperative activity in most countries is typically highly correlated (positively) with income and proximity.

[5] In our analysis we assume that China's economic centers are the metropolitan cities that lie in the center of G. William Skinner's core-periphery macro regions (Skinner, 1994) and assign a number, measured in kilometers, to each county based on the distance of the county from the nearest major economic center. For example, in Sichuan we measure the distance of each county from Chengdu. In Gansu, since there is no economic center in the province, we measure the distance between each county and Xian, the capital of the neighboring province, Shaanxi.

What. When villages in China finally do begin to form associations, the targeted activities includes a wide range of activities in the rural China (Table 9). According to our data, 70 FPAs (or 24 percent of FPAs) are involved in cropping activities, which includes all field crops, cash crops and vegetable and specialty crop producing organizations. While grain and cash cropping FPAs are the most prevalent across China in terms of sown area, the proportion of villages with FPAs that are primarily involved with grain and cash crops are relatively rare. Only 31 percent of cropping FPAs (9 percent for grain—6 FPAs—and 20 percent for cash crops—14 FPAs) are devoted to grains or cash crops. In contrast, vegetables and specialty crops have relatively more FPAs, given their relative shares of sown area. More than one-quarter of cropping FPAs focus on vegetable production (18 FPAs). More than 40 percent concentrate on specialty crops (27 FPAs), such as medicinal herbs, mushrooms and watermelons.

Because of their large share in the total population of FPAs, orchards are examined separately. In total, although the orchards only make up about 5 percent of China's sown area, they account for 18 percent of all FPAs (Table 9). In part, the greater intensity of FPAs for orchards may be explained by the greater needs for farmer assistance in both upgrading orchards technologically and in assisting them in their marketing efforts.

The largest concentration of FPAs is engaged in livestock operations. Just less than half (44 percent or 128 FPAs) are involved with livestock (Table 9). While the range of activities within livestock is great, the most frequently reported FPAs deal with hogs (19 percent of livestock FPAs or 24 FPAs) and aquaculture (18 percent or 23 FPAs). There also are a significant proportion of livestock operations that deal with beef and

dairy cattle (13 percent), mutton lamb and wool (13 percent), poultry (11 percent) and silk cocoon production (11 percent).

Some of the sample FPAs also specialized in the provision of services. Unfortunately, our survey did not ask all villages with FPAs in them to report the major tasks of their village's organization (e.g., marketing or technology). From field work, our impression is that most successful FPAs are either trying to provide their members technological assistance or marketing information and services (perhaps, with the role of technology being a bit more important). Although we can not provide more systematic details on this topic, our data do show that 14 percent of FPAs (or 40 FPAs) specifically focused their efforts on service provision without reference to a particular commodity (Table 9). Of these, most (just less than 75 percent of service-oriented FPAs or 29 FPAs) reported to be providers of technology. Less than 10 percent of FPAs said they primarily provided marketing services and less than 10 percent said they were involved in seed production and/or distribution.

Exploring Possible Determinants: Specialization, Government Policy and Learning

In this section we continue to examine our data, focusing on some of the factors that may be behind the rise of FPAs. In particular, we first examine whether of not villages with greater degrees of specialization (in cropping, by irrigated area and self-employed businesses) are more apt to have FPAs. Second, we examine the data to find if there is any evidence that officials in China's government hierarchy are most responsible for the rise of FPAs. Third, we see if there is any evidence that human capital is affecting

the emergence of FPAs. Finally, we present the results of simple regression analysis to examine what factors affect the emergence of nominal, function and formal FPAs.

Specialization and the need for new technologies and new ways to market the harvest more effectively are often the impetus for the emergence of FPAs in many countries. Unfortunately, our data on the cropping patterns within villages only allow us to breakdown crops into grain and cash crops, a gradation that may not allow use in depth insight into specialization. Even using our rough approximation, however, we do find a positive, albeit somewhat weak, relationship between specialization and the emergence of FPAs (Table 10). The proportion of the FPAs rises for all definitions of FPAs when comparing the lowest specialization quartile (those that are least specialized) to the high specialization quartile (the most specialized). One problem with our measure that may be obscuring the relationship is that while most FPAs are focused on horticulture and orchards, in many of the villages, the farmers actually specialized in grains (and rarely—in only 6 villages, as seen in Table 9—moved to start an FPA).

Areas that have high levels of irrigation, however, appear to more inclined to begin FPAs (Table 11). Those villages with less than 0.6% of irrigated area (that is, virtually unirrigated areas) have the lowest degree of FPA activity. In contrast villages with more and more irrigated area have progressively more FPA activity.

The relationship between the presence and absence of FPAs in villages with and without a substantial number of small businesses is even less sharp than the FPA-specialization relationship (Table 12). There is little differentiation among the quartiles in the proportion of FPAs in villages with little and villages with a lot of small business activity. If small businesses were to emerge more strongly in an environment that was

characterized by better markets, we might expect households in such an environment to try to innovate institutionally and start organizations such as FPAs. On the other hand, when villagers are busy with activities outside of agriculture they may have little time to invest in farm-oriented organizations. Since we see almost no FPAs that are set up to service small businesses (a puzzle in and of itself), it could be that there is some effect that retards FPA emergence, such as the rise in opportunity costs, which is offsetting and/or obscuring any market effect.

While FPAs are not clearly associated with rising specialization or small business market emergence, they clearly do rise rapidly as the government becomes involved (Table 13). For all types of FPAs, in villages in which the upper level government has taken actions to promote FPAs, associations have emerged more frequently. In villages with FPAs, only 14 to 17 percent of them are in villages in which no action was taken by upper level officials (row 2). In contrast, in villages with FPAs, 84 percent of them (30+54—rows 3 plus 4) are in villages in which upper level officials either sent an official document to or held a meeting (or both) with village leaders urging them to start FPAs. Such a result has two possible, somewhat contradictory, implications. On the one hand, it may be a sign that FPAs in the China are in fact almost fully being pushed and started by and perhaps dominated by government officials. If so, as we have seen, it could be that some FPAs are not really functioning as pro-farmer associations and may have little positive impact on the rural population. In contrast, the importance of the government in starting FPAs may, in fact, indicate that the government has an important role to play in the launching of FPAs. Because of the difficulties that are often inherent in initiating collective action, it could be that a third party is needed to get FPAs started.

Without government intervention, our data shows that few associations emerge. Of course, if an outside force is needed to start an FPA but can also be a disruptive force, the role of those charged with jump-starting China's FPA movement will require a delicate balancing of catalyzing without interfering.

Finally, areas that have high levels of human capital also appear to somewhat more likely to begin FPAs (Table 14). Those villages with less than 2.1% of the population that is a high school graduate have the lowest degree of FPA activity (row 2). In contrast villages with more high school graduates (more than 2.1—rows 3 to 5) have progressively more FPA activity.

Multivariate Analysis. In order to better understand the determinants of FPAs we use multivariate analysis. To do so, we use probit and ordered probit analysis to explain which villages have established FPAs and which have not. In the three probit regressions we explain if a village has a nominal, formal or functioning FPA (yes or no). In the first of the next four regressions (for which we use an ordered probit estimator) we seek to explain if villages have one or two of formal and functioning FPAs (as a count). In the next three we examine how many criteria that contribute to the creation of formal, functioning and formal plus functioning FPAs exist in each village. Our independent variables include 12 factors, including per capita land holdings, the share of irrigated area, the distance to the nearest large metropolitan area, per capita income, the specialization index (linear and squared), the proportion of high school graduates, the proportion of laborers in the village that out migrate, the proportion of laborers in the village the have a job in the local wage earning sector, the proportion of households that

have a small business, the first year that the county established an FPA and the effort in promotion put out by the government. In total, we had 2289 villages with complete data.

Consistent with a number of our descriptive statistics we find several robust and strong relationships (correlations). For example, the share of irrigation was a strong positive factor in all of the regressions. In contrast, the further away from the city was the village, the lower the likelihood was the probability. Income was positive in all of the regressions, though only significant in two. Hence, according to our analysis, we find that those villages that were irrigated, relatively closer to the city and somewhat richer were more likely to have FPAs.

The structure of the village's economic activities also appears to matter. Villages with a lot of out migration systematically have less FPA activity. Those with more wage-earning non farm activity also have less FPAs. Interestingly, small business ownership did not contribute or detract from FPA emergences, perhaps reflecting the tension of the focusing on non farm sector but the need to cooperate. Clearly most FPAs are for those that are still engaged in farming.

Finally, as in the descriptive statistics, the role of the government in starting up FPAs is evident. When the government sent documents and held meetings, FPA activity increased. This finding reflects the need for a catalyst to begin FPAs in general. Interestingly, per capita land, specialization, the human capital indices and the years that the county has had FPAs have no significant correlations in the regression analysis.

Conclusions and Implications

There are a number of findings and implications of our work. In this section, we list them in bullet points to emphasize some of the important ones:

-- FPAs do exist in China; however, they are still in a fairly early stage of emergence. About 7 percent of villages in China have functioning FPAs. Only around 2 to 3 percent of China's households participate in any type of FPA. Although the level of participation is low, in recent years the pace of emergence has risen rapidly and appears to be accelerating.

-- We also have shown that not all FPAs are the same. When analyzing FPAs, we have shown that there is a great difference between those that are formal and informal and those that are functioning and those that are not. Interestingly, we also find that although there is some overlap between formal and functioning FPAs, most non-functioning ones are actually formal ones; and most informal FPAs function well according to our definition. This may have implications for the formal registration and charting requirements of FPAs as leaders seek to expand the role of FPAs in China. It could be that fewer formal rules may not harm the functioning of the FPA movement.

-- We also find that although FPAs summarily are in richer villages, there are substantial numbers poorer areas. There is a non-linear relationship between income and FPA participation.

-- One of the most distinctive correlates of FPAs is the distance from a major economic center. As villages move further away from major economic centers,

FPA activity falls rapidly. This means that if households in more remote areas are going to start FPAs, they will require substantially more help than in the past.

-- We find little spontaneous (or strong) relationship between specialization and marketization (for small businesses) and FPA emergence. It could be that our measures are just not very sensitive. However, it could be that the environment is such that household can not easily or spontaneously begin FPAs.

-- On the other hand, the government clearly has a big influence on the emergence of FPAs—of all types. The pervasiveness of government influence may mean that they have been a disruptive force (since many do not function) or it may mean that FPAs need the government to initiate them. Such a finding may mean the those in charge of the rural economy may consider to adopt a system like that used in other countries in which government employees are hired with the explicit job to be an advocate for the starting and operating of FPAs. Such an official would be rewarded to the rapid expansion of FPAs as long as they developed in a way that were pro-farmer and positively affect rural welfare.

Although the impetus to meet and act as a group must be from the farmers themselves, the government can create an environment in which FPA can thrive. *First*, leaders need to develop laws and regulations that promote and protect FPA. The legal status of groups needs to be clear. FPA need to have the ability to enter into contracts and take loans. Also beneficial would be regulations that enable farmers to organize themselves into locally-run credit cooperatives. FPA need the authority to be able to act for the members of their group as well as to be subject to well-designed regulations that protect the membership from the leadership, including the way in which the leadership is

selected and monitored. FPA leaders tell us the lack of formal, annual membership fees is hurting their efforts to expand, since every effort to act as an FPA often must be accompanied by an assessment of fees on members.

Second, the experience of FPA in other countries has shown that even when a favorable legal and regulatory framework exists, an independent catalyst (that is, someone or group outside the government) is often needed to get FPA started, expand and perform better. While China has a number of FPA-promoting agencies, these institutions are controlled by the Government. Alternative models should be sought to create catalysts that are first and foremost responsive to the needs of farmers' and FPAs. The main role of such an advocacy organization is not to control FPA, but to facilitate their creation and provide information that allows its members to promote the interest of the association.

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Table 1. National Point Estimates of Villages and Farm Households that Participates in Farmer's Professional Associations (FPAs) in China, 2003.

		Total FPAs [a]	Formal FPAs [a]	Functional FPAs [a]
National Point Estimates of Number of Villages with FPAs [b]	Percent	10.21	7.49	7.50
	Number of Villages (thousands)[c]	75	55	55
National Point Estimates of Number of Farm Households that Participate in FPAs [b]	Percent	2.91	1.76	2.08
	Number of Households (millions)[d]	6.93	4.19	4.95

[a] Total FPAs include all reported FPAs without any qualifications. Formal FPA's is a term that designates FPAs in villages that meet three of the four criteria, including being registered, being chartered, having formal membership requirements and/or charging annual fees. Functional FPA's is a term that designates FPAs in villages that meet three criteria, including *not* being registered as a commercial entity in Marketing Administration Bureau, *not* being mainly set up to run a commercial business and *not* being dominated by a government official in the making of major decisions.

[b] Regional weights are calculated for six regions in China that are estimated on the basis of estimates from the six sample provinces. Jiangsu represents the eastern coastal areas (Jiangsu, Shandong; Shanhai, Zhejiang, Fujian and Guangdong); Sichuan represents the southwestern provinces (Sichuan, Guizhou and Yunnan) plus Guangxi; Shaanxi represents the provinces on the Loess Plateau (Shaanxi and Shanxi) and neighboring Inner Mongolia; Gansu represents the rest of the provinces in the northwest (Gansu, Ningxia; Qinghai and Xinjiang); Hebei represents the north and central provinces (Hebei; Henan; Anhui; Hubei; Jiangxi; and Hunan); and Jilin represents the northeastern provinces (Jilin, Liaoning and Heilongjiang). While we recognize that we have deviated from the standard definition of China's agoecological zones, the realities of survey work justified our compromises. The regional population weight is the population of the region (the sum of the population of all of the provinces in the region) divided by the sum of the populations of all of the region

[c] Number of villages estimated by multiplying the estimated proportion of villages with FPAs (row 1) times the number of villages in rural China (737,000—China National Statistical Yearbook, 2001).

[d] Number of households estimated by multiplying the estimated proportion of households that participate in FPAs (row 3) times the number of households in rural China (238.1 million—China National Statistical Bureau, 2001).

Source: Authors' survey

Table 2. Analyzing the Formality and Functionality of Farmer's Professional Associations (FPAs) in Rural China, 2003.

	FPAs that answered yes to the following questions: (percent)	FPAs that answered "no" to the following questions: (percent)
Formality criteria [a]		
Registration	74	26
Formal Membership	72	28
Having Formal Charters	82	18
Having Annual Fees	14	86
Formality Index	Number of "yes" answers:	Frequency of "yes" answers (percent)
(FPA is formal if at least two of the four functionality criteria are met)	0	2
	1	15
	2	**33**
	3	**41**
	4	**10**
	FPAs that answered yes to the following questions: (percent)	FPAs that answered "no" to the following questions: (percent)
Functionality criteria [b]		
Not registered as commercial entities at the marketing administration bureau	94	6
Government leaders don't have dominant authority in decision-making	90	10
No commercial	81	19
One-person-one-vote [c]	77	23
Functionality Index	Number of "yes" answers:	Frequency of "yes" answers (percent)
(FPA is functional if all three functionality criteria are met)	0	0
	1	4
	2	27
	3	**69**

[a] Formality is a term that designates FPAs in villages that meet three of the four criteria, including being registered, being chartered, having formal membership requirements and charging annual fees.
[b] Functionality is a term that designates FPAs in villages that meet three criteria, including *not* being registered as a commercial entity in Marketing Administration Bureau, *not* being mainly set up to run a commercial business and *not* being dominated by a government official in the making of major decisions.
[c] We do not include "one-person / one-vote as part of the functionality index. We do, however, report it, since in some circles this is an important sign of being a functioning FPA.

Data Source: Authors' survey.

Table 3. Relationship between Formality and Functionality in the Organization of Farmer's Professional Associations (FPAs) in Rural China, 2003.

			Functionality [b]	
			No (according to criteria, FPA is *not* a functional FPA)	Yes (according to criteria, FPA is a functional FPA)
Formality [a]	No (according to criteria, FPA is *not* a formal FPA)	0	6 (2%)	42 (15%)
	Yes (according to criteria, FPA is a formal FPA)	1	81 (29%)	152 (54%)

[a] Formality is a term that we coin here that designate FPAs in villages that meet three of the four criteria, including being registered, being chartered, having formal membership requirements and charging annual fees.

[b] Functionality is a term that we coin here that designate FPAs in villages that meet three criteria, including *not* being registered as a commercial entity in Marketing Administration Bureau, *not* being mainly set up to run a commercial business and *not* being dominated by a government official in the making of major decisions.

Data source: Authors' survey.

Table 4. The Year of Establishment of Farmer's Professional Associations in Rural China, 1980 to 2003.

Year FPA was Established	Number of FPAs during year	Cumulative Percentage
1980	1	0.3
1986	1	1
1990	5	2
1991	1	3
1992	4	4
1993	2	5
1994	15	10
1995	4	11
1996	6	13
1997	9	17
1998	38	30
1999	42	44
2000	28	54
2001	55	73
2002	52	91
2003	27	100
Total Number of FPAs	290	

Data Source: Authors' Survey.

Table 5. Estimated Proportion of Farmer's Professional Associations (FPAs) in Sample Provinces and Regions in Rural China, 2003.

Province	Proportion of FPAs by Province				Proportion FPAs by Region [a]			
	Population weight[c]	Total FPAs [c]	Formal FPAs [c]	Functioning FPAs [c]	Population weight[c]	Total FPAs [c]	Formal FPAs [c]	Functioning FPAs [c]
	(Percent)				(Percent)			
Jiangsu	20	12	13	10	28	17	19	12
Gansu	7	5	6	6	4	3	4	4
Sichuan	36	32	35	35	21	19	22	16
Shaanxi	11	21	19	18	7	14	14	8
Jilin	5	4	4	4	6	3	4	6
Hebei	20	26	22	26	33	44	38	55
Total	100%	100%	100%	100%	100%	100%	100%	100%

[a] The sample regions are estimated from the six sample provinces. Jiangsu represents the eastern coastal areas (Jiangsu, Shandong; Shanhai, Zhejiang, Fujian and Guangdong); Sichuan represents the southwestern provinces (Sichuan, Guizhou and Yunnan) plus Guangxi; Shaanxi represents the provinces on the Loess Plateau (Shaanxi and Shanxi) and neighboring Inner Mongolia; Gansu represents the rest of the provinces in the northwest (Gansu, Ningxia; Qinghai and Xinjiang); Hebei represents the north and central provinces (Hebei; Henan; Anhui; Hubei; Jiangxi; and Hunan); and Jilin represents the northeastern provinces (Jilin, Liaoning and Heilongjiang). While we recognize that we have deviated from the standard definition of China's agoecological zones, the realities of survey work justified our compromises.

[b] Total FPAs are all of those reported by respondents without being subject to any qualifications. Formal and Functional FPAs are defined in Tables 2 and 3 and in text.

[c] The provincial population weight is the population size of the province divided by the sum of the populations of the provinces. The region population weight is the population of the region (the sum of the population of all of the provinces in the region) divided by the sum of the populations of all of the region.

Data Source: Authors' Survey.

Table 6. The Appearance of Clusters of Farmer's Professional Associations within Sample Counties by Province in Rural China, 2003.

Province	Number of FPAs in Counties:		
	No FPAs	1 to 10 FPAs	Greater than 10 FPAs
		(Number of Counties)	
Jiangsu	1	2	3
Gansu	2	3	1
Sichuan	0	5	1
Shaanxi	0	3	3
Jilin	0	5	1
Hebei	0	3	3
Total Number of Counties	3	21	12
% of Sampled Counties	8%	59%	33%
Total Number of FPAs	0	79	211
% of Total FPAs that are found in Clusters of 1to 10 or Greater than 10	0%	27%	73%

Data Source: Authors' Survey.

Table 7. The Proportion of Villages with Farmer's Professional Associations (FPAs) by Per Capita Income Quartiles (Yuan per capita) in Rural China, 2003.

Per Capita Income Quartiles of Villages (615 villages per quartile)	Total FPAs [a]	Formal FPAs [a]	Functional FPAs [a]
Number of Observations	290	231	209
	(proportion of FPAs in different income quartiles)		
Less than 900 Yuan	26	22	21
901 to 1580 Yuan	15	14	15
1581 to 2430 Yuan	21	23	24
Greater then 2430 Yuan	39	41	40
Total	100%	100%	100%

[a] Total FPAs are all of those reported by respondents without being subject to any qualifications. Formal and Functional FPAs are defined in Tables 2 and 3 and in text. All numbers weighted with regional weights where the regional population weight is the population of the region (the sum of the population of all of the provinces in the region) divided by the sum of the populations of all of the region.

Data Source: Authors' Survey.

Table 8. The Proportion of Villages with Farmer's Professional Associations (FPAs) by Geographic Location (Measured as Distance between Home County and Nearest Major Economic Center in Kilometers) in Rural China, 2003.[a]

Distance Quartiles	Total FPAs [a]	Formal FPAs [a]	Functional FPAs [a]
Number of Observations	290	231	210
	(proportion of FPAs in different distance quartiles)		
Greater than 460 km	7	9	5
291 to 460 km	20	24	20
201 to 290 km	18	11	15
Less than 200 km	55	56	59
Total	100%	100%	100%

[a] The distance variable measures the distance in kilometers between the sample county and the nearest major economic center. The major economic centers for counties in each province: for Jiangsu—Shanghai; for Jilin—Shenyang; for Hebei—Beijing; for Sichuan—Chengdu; for Shaanxi—Xian; for Gansu—Xian.

[b] Total FPAs are all of those reported by respondents without being subject to any qualifications. Formal and Functional FPAs are defined in Tables 2 and 3 and in text. All numbers weighted with regional weights where the regional population weight is the population of the region (the sum of the population of all of the provinces in the region) divided by the sum of the populations of all of the region.

Data Source: Authors' Survey.

Table 9. The Main Economic Activities Pursued by Farmer's Professional Associations in Rural China, 2003.

		Total FPAs		
		Major Group Subtotal[a]	Minor Group Subtotal[a]	Specific Crops[a]
Cropping	**Subtotal**	**70 (24%)**		
	Grain and General Cropping		6 (9%)	
	Cash Crops		14 (20%)	
	Cotton			4 (29%)
	Tobacco			8 (57%)
	Peanuts, etc.			2 (14%)
	Vegetables		18 (26%)	
	Specialty Crops		27 (39%)	
	Medical Herbs			8 (30%)
	Water Melon			6 (22%)
	Mushroom			5 (19%)
	Other Specialty Crops			8 (30%)
	Others		5 (7%)	
Orchards	**Subtotal**	**52 (18%)**		
	Orchards		37 (71%)	
	Specialty Fruits		15 (29%)	
Livestock	**Subtotal**	**128 (44%)**		
	Hogs		24 (19%)	
	Beef and Dairy Cattle		16 (13%)	
	Mutton, Lamb & Wool		16 (13%)	
	Poultry		14 (11%)	
	Aquaculture		23 (18%)	
	Silk Cocoon Products		14 (11%)	
	General and Others		21 (16%)	
Technologies & Services	**Subtotal**	**40 (14%)**		
	General Technologies		29 (73%)	
	Marketing		4 (10%)	
	Others		7 (18%)	

Data Source: Authors' Survey.

[a] First number is number of observations in sample; figure in parentheses is subgroup total in percent.

Table 10. The Proportion of Villages with Farmer's Professional Associations (FPAs) by Degree of Specialization in Rural China, 2003.[a]

Specialization Index Quartiles	Total FPAs [b]	Formal FPAs [b]	Functional FPAs [b]
Number of Observations	290	231	210
	(proportion of FPAs in different Specialization Index quartiles)		
Less than 0.01	18	18	21
0.01 to 0.06	28	26	23
0.06 to 0.18	27	24	29
Greater then 0.18	27	31	27
Total	100%	100%	100%

[a] The Specialization Index is calculated as follows: Index = (share of sown area for cash crop)^2 + (share of orchard area)^2 which is a measure that achieves a maximum at 1 (most specialized) and minimum of near zero (least specialized).

[b] Total FPAs are all of those reported by respondents without being subject to any qualifications. Formal and Functional FPAs are defined in Tables 2 and 3 and in text. All numbers weighted with regional weights where the regional population weight is the population of the region (the sum of the population of all of the provinces in the region) divided by the sum of the populations of all of the region.

Data Source: Authors' Survey.

Table 11. The Proportion of Villages with Farmer's Professional Associations (FPAs) by Irrigation Rate of Arable Land in Rural China, 2003.[a]

Irrigation Rate Quartiles	Total FPAs [b]	Formal FPAs [b]	Functional FPAs [b]
Number of Observations	290	231	210
	(proportion of FPAs in different Irrigation quartiles)		
Less than 0.6%	13	15	11
0.6 to 43.3	16	20	18
43.3 to 91.1	24	30	27
Greater then 91.1	47	36	45
Total	100%	100%	100%

[a] Irrigation rate=irrigated area/arable land area of the village.

[b] Total FPAs are all of those reported by respondents without being subject to any qualifications. Formal and Functional FPAs are defined in Tables 2 and 3 and in text. All numbers weighted with regional weights where the regional population weight is the population of the region (the sum of the population of all of the provinces in the region) divided by the sum of the populations of all of the region.

Data Source: Authors' Survey.

Table 12. The Proportion of Villages with Farmer's Professional Associations (FPAs) that are Associated with Different Levels of Business Activities from Household Businesses in Rural China, 2003.

Share of Households with Small Businesses	Total FPAs [a]	Formal FPAs [a]	Functional FPAs [a]
Number of Observations	290	231	210
	(proportion of FPAs in different small business quartiles)		
Less than 1.53%	22	26	24
1.54 to 3.22	20	20	26
3.23 to 6.45	31	25	22
Greater then 6.45	27	29	28
Total	100%	100%	100%

[a] Total FPAs are all of those reported by respondents without being subject to any qualifications. Formal and Functional FPAs are defined in Tables 2 and 3 and in text. All numbers weighted with regional weights where the regional population weight is the population of the region (the sum of the population of all of the provinces in the region) divided by the sum of the populations of all of the region.

Data Source: Authors' Survey.

Table 13. The Proportion of Villages with Farmer's Professional Associations (FPAs) that are Associated with Different Levels of Government Promotion of FPA Activities in Rural China, 2003. [a]

Degree of Involvement by Government Officials in Promotion of FPAs	Total FPAs [b]	Formal FPAs [b]	Functional FPAs [b]
Number of Observations	290	230	211
	(proportion of FPAs in different government involvement quartiles)		
None	16	17	14
Documentations or Meetings	30	25	28
Documentations and Meetings	54	58	58
Total	100%	100%	100%

[a] Government involvement in promoting FPAs includes two types: the issuance of government documents and the convening of meetings.

[b] Total FPAs are all of those reported by respondents without being subject to any qualifications. Formal and Functional FPAs are defined in Tables 2 and 3 and in text. All numbers weighted with regional weights where the regional population weight is the population of the region (the sum of the population of all of the provinces in the region) divided by the sum of the populations of all of the region.

Data Source: Authors' Survey.

Table 14. The Proportion of Villages with Farmer's Professional Associations (FPAs) by Human Capital in Rural China, 2003.[a]

Human Capital Index Quartiles	Total FPAs [b]	Formal FPAs [b]	Functional FPAs [b]
Number of Observations	290	231	210
	(proportion of FPAs in share of high school graduates quartiles)		
Less than 2.1%	21	17	18
2.1 to 4.3	26	28	29
4.3 to 8.6	25	26	26
Greater then 8.6	28	29	27
Total	100%	100%	100%

[a] Human capital is defined by the share of high school graduates over total village population.

[b] Total FPAs are all of those reported by respondents without being subject to any qualifications. Formal and Functional FPAs are defined in Tables 2 and 3 and in text. All numbers weighted with regional weights where the regional population weight is the population of the region (the sum of the population of all of the provinces in the region) divided by the sum of the populations of all of the region.

Data Source: Authors' Survey.

Table 15. Regression Results for the Determinants of FPAs in China.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Nominal	Formality	Functioning	Formality & Functioning	Formality	Functioning	Formality & Functioning
	Probit	Probit	Probit	Ordered Probit	Ordered Probit	Ordered Probit	Ordered Probit
Per Capita Land	0.012	0.006	0.010	0.027	0.012	0.017	0.013
	(0.024)	(0.026)	(0.022)	(0.023)	(0.023)	(0.024)	(0.021)
Share of Irrigated Area	0.686**	0.261	0.573***	0.724***	0.740***	0.563***	0.669***
	(0.267)	(0.186)	(0.209)	(0.258)	(0.217)	(0.209)	(0.202)
Distance to the City	-0.201**	-0.030	-0.096	-0.192*	-0.156*	-0.133	-0.127
	(0.095)	(0.098)	(0.081)	(0.098)	(0.081)	(0.091)	(0.079)
Per Capita Income	-0.021	0.241**	0.135	0.166	0.067	0.179*	0.096
	(0.138)	(0.111)	(0.124)	(0.127)	(0.109)	(0.107)	(0.111)
Specialization Index	0.210	-0.339	0.080	0.014	-0.160	-0.049	-0.234
	(0.731)	(0.685)	(0.675)	(0.750)	(0.684)	(0.685)	(0.688)
Specialization Index2	-0.342	0.367	-0.024	-0.136	0.019	-0.073	0.303
	(0.968)	(0.880)	(0.992)	(1.002)	(0.983)	(0.935)	(1.049)
Prop. of High School Graduates	0.411	1.061*	0.845	0.810	0.781	0.820	0.838
	(0.695)	(0.640)	(0.612)	(0.704)	(0.611)	(0.645)	(0.599)
Prop. of Out-migrated Laborers	-1.169***	-1.286***	-1.058***	-0.810**	-1.030***	-1.051***	-1.040***
	(0.422)	(0.358)	(0.322)	(0.374)	(0.358)	(0.344)	(0.327)
Prop. of Households In Non-farming	-1.216**	-1.674***	-1.626***	-1.937**	-1.742***	-1.945***	-1.697***
	(0.578)	(0.643)	(0.496)	(0.770)	(0.559)	(0.684)	(0.514)

Share of Households with Small Businesses	0.385 (0.556)	0.051 (0.543)	0.380 (0.505)	-0.029 (0.590)	0.305 (0.526)	0.139 (0.546)	0.272 (0.520)
Years of the County W/ FPAs (Learning)	0.024 (0.015)	0.055*** (0.011)	0.046*** (0.012)	0.036** (0.015)	0.044*** (0.013)	0.043*** (0.012)	0.048*** (0.012)
Gov't Promotion of FPAs	0.264*** (0.051)	0.206*** (0.054)	0.200*** (0.048)	0.225*** (0.054)	0.186*** (0.048)	0.225*** (0.051)	0.198*** (0.048)
Observations	2289	2289	2289	2289	2289	2289	2289

Note: The dependent variables in specification (1)-(3) are defined previously. The dependent variable in specification (4) is the summation of those in (2) and (3), those in (5) and (6) are defined by the number of yes answers in Table 2 rather than the dummy variables in (2) and (3), and the one in (7) is the summation of those in (5) and (6). Standard errors are in parentheses, and * significant at the 10 percent level, ** significant at the 5 percent level and *** significant at the 1 percent level.

Appendix TABLE 1
Sampling and Basic Statistics

	Entire Sample	Jiangsu	Gansu	Sichuan	Shaanxi	Jilin	Hebei
Observations	2459	457	329	365	369	367	574
Number of HHs	392.35	808.01	255.75	359.74	204.47	320.22	326.57
Average Village Population (persons)	1435.13	2636.19	1229.12	1265.02	856.73	1144.68	1259.07
Per Capita Arable Land (mu)	1.92	1.43	2.45	0.91	1.42	3.82	1.73
Irrigated Rate (%)	46.71	78.06	18.20	45.98	20.68	16.95	74.14
% of Exclusive Non-Farming HHs	8.42	9.72	3.48	12.83	7.71	9.80	7.06
% of HHs with Small Businesses	5.71	6.75	5.85	4.80	5.43	4.20	6.53
% of Local Wage-Laborers	7.23	3317.49	976.27	1795.72	1309.70	1654.43	1624.03
% of Commuting Wage-Laborers	8.99	9.65	3.17	4.13	7.23	4.87	11.09
% of Out-Migrated Laborers	19.38	14.95	3.43	6.76	8.00	7.66	10.32
Share of High School Graduates (%)	6.46	8.17	5.89	4.33	6.69	5.44	7.27
Per Capita Income (yuan)	1835.10	29.37	18.17	33.52	16.03	12.81	9.68
Specialization Index	0.130	0.157	0.079	0.121	0.165	0.114	0.132
Years First FPA Established	7.791	7.842	12.543	7.138	6.277	5.081	8.656