

Are pluriactive farmers in China better off? A case study from Shandong province

Sind chinesische LandwirtInnen, die weiteren (nicht-)landwirtschaftlichen Tätigkeiten nachgehen, reicher? Eine Studie aus der Shandong-Provinz

Eva Maria NOACK and Holger BERGMANN

Summary

This paper reports results from a survey among 1,342 agricultural households in Shandong province, China. It focuses on farmers' income diversification and working patterns and referring to these the influence of socio-demographic factors. The survey shows that Chinese farmers increasingly rely on non-farm activities to raise their incomes. On average only just over half of their income derives from crops. Non-farm work is associated with higher income, irrespectively of the sector. Income level again correlates positively with the family head's length of education and negatively with his or her age. Whether an off-farm job is hold down is found to be dependent on age and educational level but cannot be conclusively attributed to the length of education.

Keywords: pluriactivity, income diversification, rural economy

Zusammenfassung

In diesem Artikel werden Ergebnisse einer Umfrage unter 1.342 landwirtschaftlichen Haushalten in der chinesischen Provinz Shandong vorgestellt. Der Schwerpunkt liegt auf den Erwerbs- und Einkommensstrukturen und deren Zusammenhängen mit sozio-demographischen Faktoren. Die Studie zeigt, dass chinesische LandwirtInnen zunehmend nicht-landwirtschaftlichen Tätigkeiten nachgehen, um ihr Einkommen zu erhöhen. Durchschnittlich wird nur etwas mehr als die Hälfte des Haushaltseinkommens aus Ackerbau erzielt. Nicht-landwirtschaftliche Arbeit ist - unabhängig von der Branche - mit höheren Einkommen assoziiert. Ferner korreliert die Höhe des

Einkommens positiv mit dem Bildungsniveau und negativ mit dem Alter des Haushaltsvorstandes. Ob Arbeit in einer nicht-landwirtschaftlichen Branche nachgegangen wird, hängt ebenso vom Alter und Bildungsniveau ab, ist aber nicht eindeutig auf die Länge der Bildung zurückzuführen.

Schlagnorte: Erwerbskombination, Einkommensdiversifikation, Mehrfachttätigkeit, Wirtschaft im ländlichen Raum

1. Pluriactivity – a common strategy among farmers

Farmers and their families across the world have always had several occupations and hence sources of income other than farming – this behaviour is often termed ‘pluriactivity’ (see AUBERT and PERRIER-CORNET, 2009; FULLER, 1990). In addition to farming, farmers might work on other agricultural holdings, sale their products directly, or embark on non-farm employment (SCHMITT, 1992). Determinants that incite farmers to combine various economic activities can be: to struggle for survival, to augment income or to raise socio-economic status and possibly to ‘escape’ from farming. Even so, farmers usually only adopt non-agricultural sources of income when revenue from agriculture is insufficient (e.g. BARRETT et al., 2001; BUCHENRIEDER, 2005; FULLER, 1990; REARDON et al., 2007).

Off-farm employment tends to imply less risks and seasonality and might generate higher income than farming activities; however, research in developing countries has shown that pluriactive households are not necessarily socio-economically better off. Farm households’ different potentials, incentives and disincentives to become pluriactive are determined by the social, political and economic surroundings and by individual characteristics and psychological factors (e.g. AHITUV and KIMHI, 2002; DE SILVA and KODITHUWAKKU, 2005; DEININGER and OLINTO, 2001; ELLIS, 2000a, b; EVANS and ILBERY, 1993). The pluriactivity concept understands the farm household as a unit of progressive improvement; as a component of rural transition, it offers opportunities for individual as well as community well-being and in contrast to standard approaches maximizes the household income not only by farm income but also by integrating possibilities of off-farm income sources (see SCHMITT, 1992).

VAN DER PLOEG and JINGZHONG (2010) highlight that in (the People's Republic of) China the process of industrialisation has revived the peasant economy. At the same time as agricultural production grew, rural non-farm economy has flourished and diversified, especially processing of agricultural products and rural trade and services. With incomes on the rise, demand for non-farm goods and services also went up throughout rural areas, stimulating the development of rural non-farm economic activities. This transformation from a traditional, agriculture-based to a more diversified rural economy in the past three decades has brought about more pluriactive farmers. Agricultural land is contracted from the village committee to Hùkǒu² registered inhabitants. It cannot be sold; so many farms are too small to generate additional income apart from producing the minimum necessary to feed the family. Albeit, rural incomes have increased, they have fallen behind urban incomes. The rural-urban income gap entails a massive internal migration phenomenon. Remittances from migrant workers guarantee income flows back to the countryside (DÉMURGER et al., 2007; FAN, 2008; FAS, 2009; ROSEGRANT and HAZELL, 2001; TUAN et al., 2000). This paper focuses on income diversification of farm households considering the economic activities of all family members, farming and non-farming. Working patterns are identified, income sources are analysed, and the influence of socio-demographic factors is elucidated.

2. Study area and methodology

A survey was conducted among 1,342 farm households in two counties – Huimin (n = 629) and Shouguang (n = 682) – in Shandong Province in 2009.³ Being a leading farming region in China, Shandong is relatively rich compared to other provinces. Food processing industries are largely based on crop and vegetables growing in small scale farms. Yet, those 37% of people working in the primary sector generate less than

² System of residence permits; people living outside their Hùkǒu registration do not qualify for certain public social, educational or health care services (FAN, 2008).

³ The study was carried out within a project co-funded by the German Federal Ministry of Education and Research (no. 0330800A-F) and the Chinese Ministry of Science and Technology (no. 2007DFA30850).

10% of the gross regional product (JU et al., 2006; SHANDONG GOVERNMENT, 2010). Data analysis was done with IBM Statistics 22.0.

3. Results

The polled farm households consist of 3.9 persons on average (± 1.4). Average farm size is 0.49 ha (± 0.39), with a plot size of 0.33 ha (± 0.29). Heads of household are aged 51.2 years (± 10.0); the 12% female family heads are four years younger. On average, heads of household were thus born in the late 1950s, but in fact hardly any were born between 1959 and 1962 (cf. Fig. 1), years of the famine during the Great Leap Forward. Male family heads have enjoyed an average of 7.8 years of education (± 3.0), female 5.0 years (± 3.6), most between 5 and 9 years.

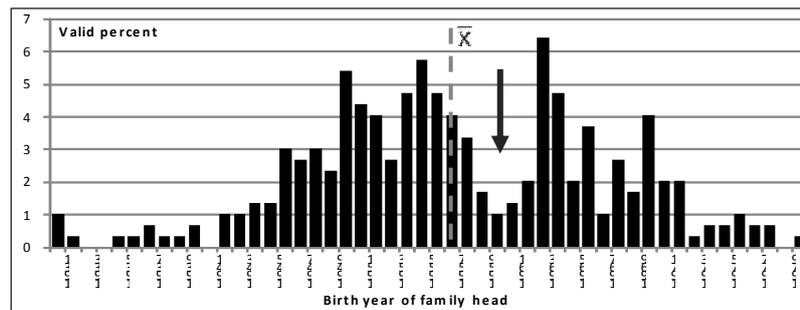


Fig. 1: Family heads' birth years; decline in the birth rate in the late 1950s
Source: Own data

3.1 Off-farm work depends on age, level of education and gender

On average, family heads spend nearly four fifth of their working time on own agricultural activities. More than two thirds of them work full-time at their farm, 21.9% say they work part time on-farm and only 6.5% exclusively work in the non-farming sector. As table 1 suggests, farmers seem to work either hardly or exclusively on their farm.

There is a positive correlation (adjusted $R^2 = 0.039$, $\beta = 0.200^{***}$; *** for $P = 0.000$) between the age of the family head and the percentage of working time he or she spends working on-farm. As table 2 shows, older family heads are more likely to spend a high share of working time on-farm; the younger the more the family heads work off-farm.

Family heads with lower levels of education spend more time working on the farm; the higher their level of education the more likely are the

heads of household to work part-time on the farm and part-time in the non-farming sector. However, between family heads' actual length of education (in years) and the time spent on-farm there is a significant negative correlation only for those heads of households aged 51 years (= average age) or less (adj. $R^2 = 0.025$, $\beta = -0.163^{***}$). For family heads older than 51 years there is no such correlation.

Table 1: Proportion of head of household's on-farm work in percent

Time spent on farm	Huimin	Shouguang	Categorisation
0-25%	13.7%	21.4%	non-agricultural workers
>25-50%	9.9%	5.7%	
>50-75%	3.0%	2.6%	pluriactive farmers
>75-100%	73.4%	70.2%	farmers

Source: Own data

Table 2: Time family heads spend with on-farm work differentiated by average age

Time spent on farm	less than 51 years (n = 592)	51 years or older (n = 720)
full-time	55.1%	80.8%
part-time	34.8%	11.5%
none	10.0%	3.8%

Source: Own data

In larger households, the family head is more likely to work full-time on farm while other family members are more likely to work off-farm. No significant correlation was found between the plot size and the proportion of time spent on-farm by the head of household. While a third of male family heads work off-farm, only 12% of female head of households do so.

Of all family members working off-farm ($n = 1,509$), 37.8% work in an enterprise, 20.5% in engineering or construction. Another 11.6% have a job in wholesale or retail trade, 8.6% as a craftsman, 6.8% in transportation, and 5.3% in a public institution. The latter shares are similar for family heads ($n = 367$) but main employment is inverse: 36.5% work in engineering/construction, 22.1% in an enterprise.

Many of these pluriactive farmers work in the same township: 34.7% in Huimin and 55.2% in Shouguang. In Huimin 24.1%, in Shouguang 30.3% work in another township in the same county; in Huimin 27.4% work in another county in the same province, in Shouguang this is the case for 11.2%. Family heads work closer by: same township: 52.5% in Huimin, 67.2% in Shouguang; other township: 21.6% in Huimin, 25.0% in Shouguang; other county: 20.4% in Huimin, 6.4% in Shouguang.

3.2 Household income composition and influencing factors

The average annual income of the polled farm households (including remittances) amounts to 18,500 Yuan (approx. 2,270 €), 16,000 Yuan in Huimin and 20,500 Yuan in Shouguang county. In Shouguang, 40% of households earn more than 20,000 Yuan a year, in Huimin 25%. As all polled households were farm households, practically all have agricultural income; its actual share and its composition however vary substantially within the sample. More than half of the households earn more than 50% from cropping, for 22.5% of families this share is more than 90%. On average, 57% of income derives from plant production, 5% from livestock, 32% from off-farm activities and 6% from subsidies and other sources.

There is a negative correlation between the income level and the share of income from agriculture ($\beta = -0.441^{***}$, adj. $R^2 = 0.193$) and a positive correlation between the level of income and off-farm work ($\beta = -0.311^{***}$, adj. $R^2 = 0.094$). The larger a household's income the lower the share deriving from crop, and vice versa. Conversely, off-farm work gains in importance with rising income. Interestingly, the sector of off-farm work does not correlate with income group. Livestock and subsidies do not pass the significance test, indicating that these sources have no significant impact on income level. Yet, when differentiating three income groups, the proportion of income from livestock seems to increase with rising income in both counties (cf. Fig. 1). The share of subsidies diminishes with rising income: in households earning more than 50,000 Yuan subsidies make up 1% of the income.

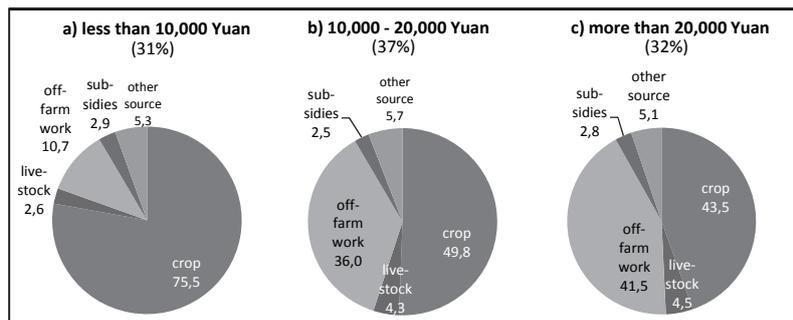


Fig. 1: Composition of household income differentiated by income groups
Source: own data and calculations

The level of income is positively influenced by the family head's length of education (Huimin: $R^2 = 0.032$, $\beta = 0.197$ with $P = 0.01$; Shouguang: $R^2 = 0.075$; $\beta = 0.274^{***}$), but negatively by his or her age (Huimin: $R^2 = 0.039$, $\beta = 0.179$ with $P = 0.05$; Shouguang: $R^2 = 0.047$; $\beta = 0.228^{***}$). There is no significant correlation between age and length of education. Households managed by a woman tend to be slightly better off but the number of female family heads is too small to say this surely.

A negative correlation ($R^2 = 0.031$; $\beta = -0.184^{***}$) is found between income level and the proportion of working time on the farm: the higher shares of on-farm work result in lower income and vice versa.

4. Discussion and conclusion

The study shows that the farm household's income mainly derives from agriculture. The farm household's average annual income and figures concerning its composition are consistent with official statistics (CHINA STATISTICS PRESS, 2009). An income of 18,500 Yuan is higher than the national average in the primary sector but relatively low compared to the average income of employees in other sectors in Shandong Province (ibid.). Higher household incomes in Shouguang county can be explained by the fact that more polled farmers work off-farm. The predominating vegetable production and connected processing industries might offer more job opportunities. Additional income in turn generates further demand for goods and services.

The typical farm cultivates only 0.5 ha of farmland (0.3 ha of crop land). Relying only on on-farm income would mean a low standard of living. Hence, remittances from family members as well as off-farm income are necessary for the farm family's economic security. Indeed, many farm families invest at least part of their labour power off-farm.

In this study, male, young, educated farmers are more likely to be pluriactive. In contrast to the study by LIU et al. (2013) (for farmers in the mountainous province Sichuan) the impact of age is significant: older farmers spend more time working on-farm. It could be assumed that older farmers are less flexible or insufficiently skilled for the non-farm labour market, thus they continue working on farm. Still, many older family members also work off-farm in addition to farming.

The average family size of around four persons and a closer look at the family's age distribution and working pattern reveals that next to the older generation in many families young children stay with their grandparents on the farm while their parents (aged 20 to 40 years) are work in enterprises, construction services or wholesale, depending on the industrial infrastructure of the region. They generate off-farm income for the whole family while the older generation farms the land and takes care of the children. Thus, a reason for some (mostly the elderly) family members to stay on the farm might be – on the one hand – the remnants of the Hùkǒu system (children could not enrol to school elsewhere). On the other hand, agricultural land serves as a kind of security and needs to be cultivated. This intergenerational division of labour also reveals how important family ties and mutual support are in Chinese society. In larger families, family heads spend more time working on-farm – apparently, the more family members the easier it is to have one person primarily responsible for maintaining the farm work. In smaller families farm work is put aside for the benefit of off-farm work. This indicates the priority of off-farm work.

It has been claimed that pluriactive households are not necessarily better off. In our study though, pluriactivity, especially off-farm work, is associated with higher household income; high shares of on-farm work come along with low income levels. The sector of off-farm work seems to be irrelevant. Apparently, farmers working in the non-farming sector are better off than full-time farmers, no matter where they work. In view of this, it is clear why most families combine small-scale farming with other economic activities to supplement income and probably also to have the perspective to get off the contemptuously rural lifestyle.

Considering an average length of education of 7.8 years, most of the polled farmers are quite well educated by Chinese standards. Many studies highlight positive effects of education for diversifying income activities (CHAPLIN et al., 2004; ELLIS, 2000b; MÖLLERS, 2006; REARDON et al., 2007). A higher level of education may qualify an individual for more and better paid jobs and tends to reduce risks of an enterprise that relate to a lack of skills or knowledge. Also in this study, a higher educational level is linked to off-farm employment. The actual length of education does not matter for older family heads; possibly they included lessons in Maoist doctrine when calculating the years.

It appears that less educated and thus poorer farmers have less remunerating job opportunities and thus lower diversification capacities. By offering (professional) skills training, especially for female farmers who rarely work off-farm, more farmers might be encouraged to enter the labour market and increase their annual household income.

In average, farmers in Shandong spend four fifth of their working time on agricultural activities and these figures fit official statistics. The plot size does not influence working time spent on farm. This could indicate that even larger farms do not allow a suitable financial outcome and that regardless of farm size off-farm jobs are more attractive. This would also affirm the assumption that in many cases adhering to part-time or full-time farming is not a free choice.

The observed working patterns and combination of income sources are probably only a transitional state during the process of structural change in Chinese farming.

References

- AHITUV, A. and KIMHI, A. (2002): Off-farm work and capital accumulation decisions of farmers over the life-cycle: The role of heterogeneity and state dependence. *Journal of Development Economics*, 68, 2, 329-353.
- AUBERT, M. and PERRIER-CORNET, P. (2009): Is there a future for small farms in developed countries? Evidence from the French case. *Agricultural Economics*, 40, 1, 797-806.
- BARRETT, C. B., REARDON, T. and WEBB, P. (2001): Nonfarm income diversification and household livelihood strategies in rural Africa. *Food Policy*, 26, 4, 315-331.
- BUCHENRIEDER, G. (2005): Non-farm rural employment - review of issues, evidence and policies. *Quarterly Journal of International Agriculture*, 1, 3-18.
- CHAPLIN, H., DAVIDOVA, S. and GORTON, M. (2004): Agricultural adjustment and the diversification of farm households and corporate farms in Central Europe. *Journal of Rural Studies*, 20, 1, 61-77.
- CHINA STATISTICS PRESS (2009): China Statistical Yearbook.
- DE SILVA, R. and KODITHUWAKKU, K. A. S. S. (2005): Pluriactivity and socio-economic success of rural households. *Sri Lankan Journal of Agricultural Economics*, 7, 85-108.
- DEININGER, K. and OLINTO, P. (2001): Rural nonfarm employment and income diversification in Colombia. *World Development*, 29, 3, 455-465.
- DÉMURGER, S., FOURNIER, M. and YANG, W. (2007): Diversification and agrarian change under environmental constraints in rural China. GATE Working Paper.
- ELLIS, F. (2000a): The determinants of rural livelihood diversification in developing countries. *Journal of Agricultural Economics*, 51, 2, 289-302.

- ELLIS, F. (2000b): Rural livelihoods and diversity in developing countries. Oxford: Oxford Development Press.
- EVANS, N. J. and ILBERY, B. W. (1993): The pluriactivity, part-time farming, and farm diversification debate. *Environment and Planning A*, 25, 7, 945-959.
- FAN, C. C. (2008): China on the move: Migration, the state, and the household. London [et al.]: Routledge.
- FAS (Foreign Agricultural Service) (2009): Agricultural Economy and Policy Report - China.
- FULLER, A. M. (1990): From part-time farming to pluriactivity: a decade of change in Rural Europe. *Journal of Rural Studies*, 6, 4, 361-373.
- JU, X. T., KOU, C. L., ZHANG, F. S. and CHRISTIE, P. (2006): Nitrogen balance and groundwater nitrate contamination. *Environmental Pollution*, 143, 1, 117-125.
- LIU, S.-Q., ZHANG, H.-Q., XIE, F.-T. and GUO, S.-L. (2013): Current situation and influencing factors of pluriactivity in mountainous and hilly rural areas of Sichuan province, China. *Journal of Mountain Science*, 10, 3, 445-454.
- MÖLLERS, J. (2006): Außerlandwirtschaftliche Diversifikation im Transformationsprozess. Halle: Leibniz-Institut für Agrarentwicklung in Mittel- und Osteuropa (IAMO).
- REARDON, T., BERDEGUE, J., BARRETT, C. B. and STAMOULIS, K. (2007): Household income diversification into rural nonfarm activities. In: Haggblade, S., Hazell, P. B. R. and Reardon, T. (eds.): *Transforming the rural nonfarm economy. Opportunities and threads in the developing world*. Baltimore: John Hopkins University Press, 115-140.
- ROSEGRANT, M. W. and HAZELL, P. B. R. (2001): *Transforming the rural Asian economy: The unfinished revolution*. Hong Kong: Oxford University Press, Asian Development Bank.
- SHANDONG GOVERNMENT (2010): Theme service: Statistics and rural services. URL: <http://www.shandong.gov.cn> (27.08.2013).
- SCHMITT, G. (1992): The Organization of Farm Production and its Implications for Agricultural Economics and Policy (Paper presented at the Policy Article Prize Seminar, Department of Agricultural and Applied Economics, University of Minnesota, April 20, 1992). Göttingen 1992, Diskussionsbeitrag 9201.
- TUAN, F., SOMWARU, A. and DIAO, X. (2000): Rural labor migration, characteristics, and employment patterns: a study based on China's agricultural census. Washington, D.C.: International Food Policy Research Institute.
- VAN DER PLOEG, J. D. and JINGZHONG, Y. (2010): Multiple job holding in rural villages and the Chinese road to development. *The Journal of Peasant Studies*, 37, 3, 513-530.

Affiliation

*Dres. Eva Maria Noack and Holger Bergmann
Georg-August-Universität Göttingen
Platz der Göttinger Sieben 5, 37073 Göttingen, Germany
Tel.: +49 (0)551 39 4813
eMail: enoack@uni-goettingen.de, hbergmal@uni-goettingen.de*