

Research Article

Analysis on the Effect of Poverty Alleviation Based on Walnut Industry

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Abstract: This study explores the poverty reduction effect of Lv-Ling model which based on walnut industry. The Walnut tree or *Juglans* is a plant genus of the family Juglandaceae; it is one of the famous nuts in the world and one of the important economic forest tree species in China. Because of development fastly, variety breeding can't keep up with development needs, causing confusion species, affected the economic benefit seriously, some even did not play benefit into death, therefore, create excellent varieties, cultivated in the most suitable area and regionalization is an urgent problem of walnut production need to solve in Hebei province. This study uses a single case study method to research the model of the leading enterprises drives, which is choosing six countries as sample points and using questionnaire survey on 180 peasant households to interview, then using the semi-structured interview with company, base manager and technical director. Calm base than the standardized method, the year-on-year growth rate method is used to analyze the data. The results show that "Lv-ling company" by planting grass in the forest, breeding chicken in the grass, chicken manure input the fens, put the rubbish into the fields of "fruit, grass, livestock, marsh" "four in one" stereo ecological planting and breeding model and to popularize it, develop the walnut industry chain of circular economy. Farmer's income, employment, green area increased significantly from 2008 to 2013, especially 2012. The local economic have promote, social and ecological benefits of coordinated development from Industry as a tool for poverty alleviation of Lv-Ling and can be used for reference for industrialization poverty alleviation in Taihang mountain area.

Keywords: Effect of poverty alleviation, industrialization poverty alleviation, Lv-ling model of poverty reduction, processing food, walnut

INTRODUCTION

The Walnut tree or *Juglans* is a plant genus of the family Juglandaceae, it is one of the famous nuts in the world and one of the important economic forest tree species in China, it has a long history of cultivation and extensive distribution in China. Although China is the world's superpower walnut production country, walnut varieties, cultivation starts late, breeding of high yield, high quality, strong adaptability varieties is still a pressing problem of walnut industry development in China. Walnut planting area reached 2163200 mu, fruit area is 1316000 acres in Hebei Province, it is one of the world's Walnut production place. The main cultivation area is in tai-hang mountain, involved shexian, lincheng. Because of development fastly, variety breeding can't keep up with development needs, causing confusion species, affected the economic benefit seriously, some even did not play benefit into death, therefore, create excellent varieties, cultivated in the most suitable area and regionalization is an urgent problem of walnut production need to solve in our province.

Kaplan and Norton who use the balanced scorecard theory to evaluated government performance of poverty

reduction conducted in-depth research; the theoretical model includes four areas: finance, internal processes, customer assessment and learning and growth areas. Jiangxi rural poverty problem research group put forward the village as the main object of evaluation, the establishment of comprehensive evaluation index system of anti poverty. Guo (2010) using data envelopment analysis, principal component analysis method, establishes the administrative village poverty alleviation monitoring and evaluation index system and evaluation model (Peijun *et al.*, 2011).

In this instance, lv-ling Company to cultivate lv-ling walnut varieties, through the development of walnut industry driven local poverty alleviation. The company creating a leading enterprise affects the walnut industry evolution, so as to promote the development of local economy, increasing the income of farmers and protect the ecological environment of combining the successful mode-Lv-Ling model of poverty reduction.

To study Lv-Ling model of poverty reduction have important meaning, first, provide theoretical reference for the further study of industrialization poverty alleviation in Taihang Mountain area. Second, carding the way and degree of influence of on farmers, can

provide some support for the industrialization poverty alleviation design (Peijun *et al.*, 2011).

MATERIALS AND METHODS

Materials: Lin-cheng county is located in the southwest of Hebei Province, west of Taihang Mountains, east of North China Plain, include 4 towns, 4 townships and 220 administrative villages. Position in the Taihang Mountains, the terrain from west to East showed ladder like distribution, mountains, hills, plains accounted for 35, 50 and 15%, respectively the average elevation is 773 m. Soil for slope sandy loam cinnamon soil, land for gravel brown soil and the soil layer is thin, natural fertility is poor, which is a mountainous county, not suitable for agricultural production. It is a warm sub humid temperate continental monsoon climate zone, spring drought, have more wind and sand, in late summer and early autumn have more rain, cold and dry winter, annual mean temperature of 13.5°, the average annual rainfall of 605 mm, annual sunshine 2658.8 h, frost free period of about 180 days, suitable for planting fruit trees (Matthew and Key, 2002). Lv-ling company, founded in 1999, is the collection of high-quality thin-skinned walnut production, research and deep processing as one of the high-tech enterprises, successfully developed with independent intellectual property rights of "lv-ling" and "lv-zao" early thin-skinned walnut varieties; it owns 15000 acres of its own walnut industrial base and 100000 acres of cooperation base, high-quality thin-skinned walnut nursery of 600 mu, has become China's largest production base of high-quality thin-skinned walnut intensification. At the same time has the ecological farming Chai Ji 50000, will expand to more than 100000 gradually.

Lincheng country is a national level poverty country, lack of soil and water. Since 1992, Lincheng county Party committee and county government were chosen the long-term development goals which is depending on the mountain out of poverty and on the forest enriching the people, had tried to promote the jujube and castor planting. But due to the lack of scientific planning, deep processing does not follow to go up, disconnection between production and market and did not bring good benefits to farmers. The Lv-Ling

company according to the natural resources advantage, location advantage, traditional advantage, policy support and technical support of walnut industry development, to increase of farmer's income, the promotion of local employment, improve the ecological environment. In 2009 the original country helps deficient up to do director Fan Xiaojian came to Lv-Ling company research, formal affirmed the Lv-Ling model of poverty reduction.

Methods:

Data source: In order to comprehensive and in-depth understanding of Lv-Ling model of poverty reduction, this study used data from many aspects: the questionnaire survey on rural households, for semi-structured interviews on the Poverty Alleviation Office staff, company, base and technical personnel. The first step, the paper uses data from the survey of 6 villages of 180 farmers on July and August of 2014. The process of determining sample are as follows: first of all, choosing 2 sample country, from the towns which led farmers to more intensive with leading enterprises; secondly, in the township of randomly selecting 3 villages as the sample village; again, randomly selecting 9 sample peasant household, which are in participating in the industrial management. This study selected the country includes, Qiandufeng, Goudufeng, Qiajiazhuang villages in Heicheng township and the country of Lijiahan, Lujiahan, Xidong in Yageying township as the sample point. In the second step, contacts with the city and county poverty relief office staff using semi-structured interview, focus on the policy support and fiscal subsidy from the local leading enterprises to understand and evaluate it. The third step, contacts with the office personnel and technical director and manager used semi-structured interview, to understanding and evaluation the number of farmers and farmer's income (Frank, 1997).

The company is evaluated the national poverty alleviation leading enterprises in 2008. This study studies the data from 2008 to 2013 during the change of the economic income, the change of employment, the company's efficiency and promotes the green area. The specific data is shown in Table 1 (Fig. 1).

Table 1: The study's data source

Data sources							
Parent index numerical	Sub indicators	2008	2009	2010	2011	2012	2013
Personal income (Yuan/month)	Base farmers	500	600	700	800	1000	1300
	Technical staff	1500	1600	1800	1900	2200	2500
	Corporate officers	1000	1100	1200	1400	1600	2000
Employment	Base farmers	3200	4100	5634	5721	6000	8000
	Technical staff	17	19	21	34	89	124
	Corporate officers	82	87	89	107	280	387
Revenues (ten thousand Yuan/year)	GDP	6529	6342	6706	7883	11515	26361
	Net profit	1270	2378	2523	3064	4419	9571
	Sales revenue	6218	6040	6387	7508	10967	25106
Green area (mu)		5400	8000	8600	86485	118500	147400

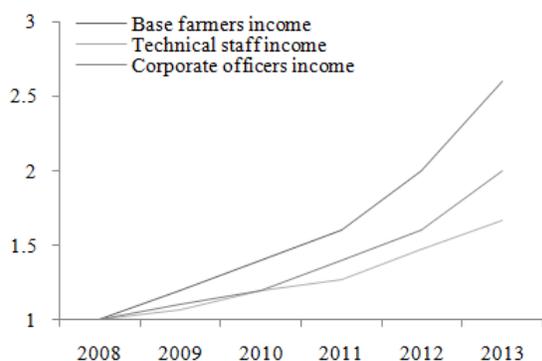


Fig. 1: Poor farmers income changes

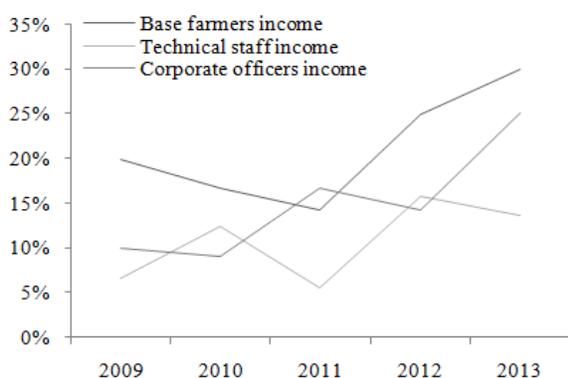


Fig. 2: Farmers income growth rate changes

Methods: From Fig. 2 we can see that under the precondition of the same parent index numerical difference between different sub indicators relatively large, so the results of the study and analysis on the data before, need to prophase data processing to more adapt to analysis in this study. Specific research method includes the following two parts.

Fixed base relative standardization method: The fixed base relative development speed is reporting the fiducial value between report level and a fixed level, indicating the overall growth rate of a phenomenon in a long time. The standardization method is firstly scaling the original data, and restricting the result in a certain numerical interval. The study adopts the fixed base relative standardization method for the data by dimensionless processing, solves the data comparability, which is comparing the data y_i of annual data x_i and the minimum x_{min} , computational formula as follows:

$$y_i = \frac{x_i}{x_{min}} (i = year 1, year 2, \dots)$$

Link relative ratio growth rate method: The growth rate method is a simple algorithm of analogizing the forecasted future value, which is according to the average growth rate of prediction in the past statistical

period. The prediction method is ordinary used in the growth rate fixed, or the growth trend will remain in the predictive period. The result of the method is the comparison value of the report level and the previous level and then reduces 1, computational formula as follows:

$$y_i = \frac{x_i}{x_{i-1}} - 1 (i = year1, year2, \dots)$$

RESULTS AND DISCUSSION

Lv-Ling from barren hills, slope, waste valleys, waste into a high-quality thin-skinned walnut base, listed as the demonstration base of Taihang mountain greening project in 2013 in Hebei province. In this study, the research object is poverty alleviation effect refers to the improvement of poverty, including the improvement of the poor peasant household economy, the improvement of employment, the improvement of the green area.

Result 1:

The change of lv-ling walnut processing products: "Lv-ling company" by planting grass in the forest, breeding chicken in the grass, chicken manure input the fens, Put the rubbish into the fields of "fruit, grass, livestock, marsh" "four in one" stereo ecological planting and breeding model and to popularize it, develop the walnut industry chain of circular economy. It mainly have walnut milk, walnut oil, the walnut nutrient milk and other food in the deep processing products, has chicken, mountain pheasant egg, honey and other food in the woods (Table 2 and 3).

Result 2:

Change of the economic income: The company has worked well in promoting farmers increase income. From Fig. 3 can be seen, poor households income, income of technical personnel and the enterprise staff income is stable growth in 2008-2013. Figure 4 shows that poor farmers income growth rate is 20% in 2009 and 2011 growth rate is 14.3%, growth slowed, there ever taken on analysis was found to land, contract orchards, hire workers three benefit coupling mechanism in the process of actual operation, cannot achieve unity, unified management, the company due to the poor quality of walnut lead to farmers income growth rate reduced year by year. Farmers income growth rate is 25% in 2012, 30% in 2013, the growth rate is 62.5% compared to 2013 with 2011, the enterprise staff income growth rate is 42.9% compared to 2013 with 2011, technical personnel growth rate is 31.6% compared to 2013 with 2011, this three income growth visibly, the analysis found that Lv-Ling model of poverty reduction shift into company + base + manager technical manager + farm households in 2012. The income growth rate analysis of enterprises and

Table 2: Lv-ling walnut through the authentication list

Year	Food
2004	National green certification
2008	National organic food certification
2011	Gold medal of walnut milk
2012	The most trusted food brands in Hebei
2013	EU organic food certification

Table 3: Walnut processing food

Processing food	Grove food
Walnut milk	Chicken
Walnut oil	Mountain pheasant egg
Walnut nutrient milk	Honey

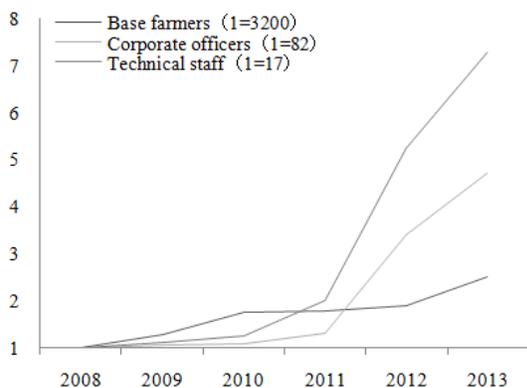


Fig. 3: Change of employment

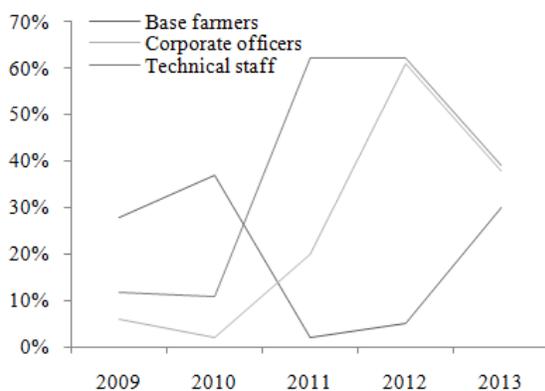


Fig. 4: Change of employment growth rate

technical personnel in Fig. 4 shows that the enterprise personnel income growth rate is 9.1% in 2010 and after a year to rise to 16.7%, it enterprise staff income had increased sharply, the reason for this is that in 2011 a walnut processing production phase ii project. And technical personnel's income growth rate rose from 5.6% in 2011 to 15.8% in 2012, is caused by deep processing need technical support.

Result 3:

Change of employment: The fixed base relative standardization method which mentioned in this study used to analyze the base drive employments in Fig. 5, confirm the employments number 3200 as base 1 in

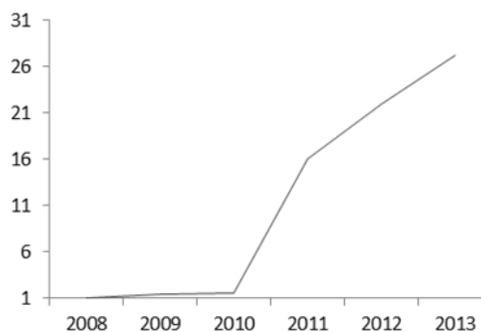


Fig. 5: The change of green area

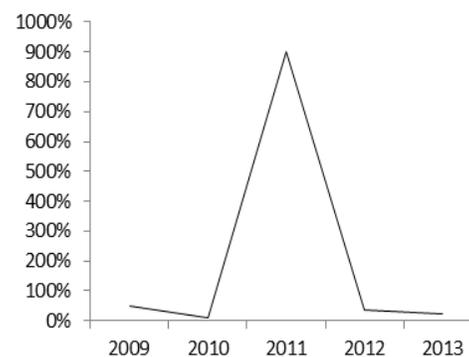


Fig. 6: Green area growth rate change

2008, can be seen that 2008 (1) to 2010 (1.76) for the slow growth stage; 2011 (1.76) to 2011 (1.89), its development is relatively slow; but in 2013 (2.5) presents a state of rapid development. Investigate its reason, the base + cooperative + peasant household mode of poverty alleviation in 2008-2011, base drive farmers for saturated, the growth is slow; but the mode invert to base manager, technical manager and employ farmers of poverty alleviation in 2012, changed the past small contract orchards. There is land benefit coupling mechanism, hiring farmers, so present state of rapid development in 2013. Analyze the base growth rate of farmers in Fig. 4, the present situation and base number of farmers presents situation are basically identical in Fig. 5. Concrete analysis, from 28% in 2009 grow to 37% in 2010, the 3 years is in a state of stable growth from 2008 to 2010; but the growth rate fell to 2% in 2011, a slight growth in 2012 (5%); growth rate reached the highest (30%) in 2013, which is caused by the Lv-Ling model of poverty reduction shifted in 2012. Analysis the number of enterprises employed in Fig. 5, 2008 (1) to 2011 (1.3), the number is in the slow growth stage; but from 2011 (1.3) to 2011 (4.72), its growth relatively outstanding, is the cause of Lv-Ling model of poverty reduction has been shift. From enterprise staff growth analysis diagram in Fig. 6, we can see that the enterprise staff relatively slow growth (6 to 2%) from 2008 to 2010; and 2011 (20%), 2012 (61%), the growth trend of relatively prominent; but

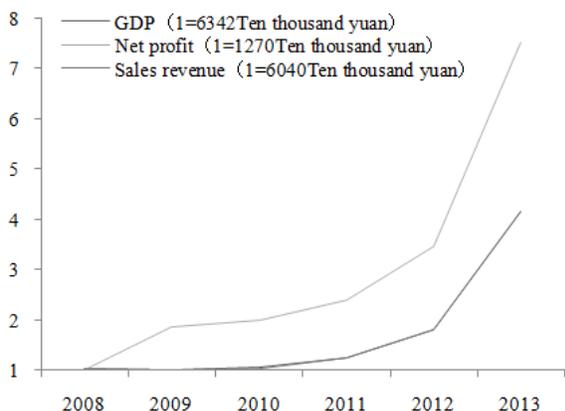


Fig. 7: The change of company benefits

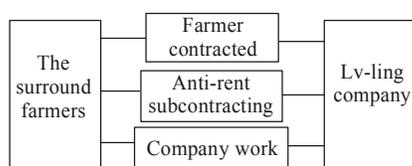


Fig. 8: Farmers and Lv-ling diagram

growth slowed in 2013 (38%), the causes similar to in Fig. 3.

Analysis technical personnel number in Fig. 5, it is increased relatively slow from 2008 (1) to 2010 (1.24); compared with the first 3 years, growth is opposite bigger in 2011 (2), presents a step growth from 2011 (2) to 2011 (7.29). Summarized reason is the model increase technical manager, cooperate with agricultural university of Hebei, successively completed green walnut research and demonstration of production technology system and so on more than 20 national and provincial research projects, made the two provincial technical standards, such as <Green food Thin-skinned walnut><Green food Precocity walnut production technology procedures>, and achieved "walnut green husk peeling machine" and other five patents. On this basis, the company pays more attention to play to the role of the technical personnel, technology of walnut before, during or after unified management. But 2013 (39%) compared with 2012 (62%) has decreased in Fig. 4, the reasons of technical personnel number growth trends is similar to the above reasons.

Result 4:

Change of green area of walnut industry: Green area relatively slow growth from 2008 (1) to 2010 (1.59); appeared inflection point in 2011 (16.02), showing a leap growth; and showed a trend of increasing from 2012 (21.94) to 2013 (27.3) in Fig. 7. The reason is that to see green area of walnut industry increased significantly, achieve the coordinated development of economic and ecological benefits.

Result 5:

Change of company benefits: Output value, net profit and sales revenue growth curve are almost consistent in Fig. 8. Output and sales revenue development trend are consistent since 2008 to 2009, because of the influence of the global economic crisis, lead to data fluctuated slightly over the past two years. A slow growth from 2009 (1) to 2011 (1.24); the first fast growth stage from 2011 (1.24) to 2012 (1.82); the second phase of rapid growth from 2012 (1.82) to 2013 (4.16). The first rapid development stage of Net income is from 2008 (1) to 2008 (1.87), this is due to Lv-Ling walnut and Wild eggs all through the national organic food certification in 2009, Lv-Ling walnut won the "Olympic recommend fruit" to stimulate consumption. It is the slow growth stage from 2009 (1.99) to 2012 (3.48); 2012 (3.48) to 2013 (7.54) is the second rapid growth stage, the growth rate is 116%, this is due to poverty alleviation mode change in 2012.

Discussion: Lv-Ling poverty alleviation through development by past there land, company hire, contract orchards of three methods for benefit into a company + base + technicians + farm households poverty reduction mode in 2012, poverty alleviation effect significantly improved. Specific analysis is as follows.

Discussion 1:

Poverty reduction mode of the past:

Farmers contracted form: Lv-Ling company signed with farmers has the legal effect of contract and technical support, production and sales expressly provide the responsibilities of the parties, the rights and obligations. Base, farmers accept the guidance of the company, do a good job in agricultural production, in accordance with the contract to sell agricultural products company, the company provide services and technical guidance for farmers and protective acquisition farmers in accordance with the principle of benefit of agricultural products (Nehmzow, 2006).

Disadvantages of the past poverty reduction mode:

From Fig. 5 and 6, we can see that since 2008, the base drive number and practitioners are hardly development status; From Fig. 5, income is increased, but growth rate is slow, from the Fig. 8 visibly see that output value, profit, sales revenue growth is slow. Therefore, comprehensive analysis met bottleneck, Lv-Ling poverty alleviation effect is not obvious in 2011.

Due to too scattered, in the process of actual operation, farmers planting walnut according to traditional customs, cannot do technology popularization, the company at the core link of outsourcing, there is no guarantee that walnut source told the high quality, the farmer's income and the walnut quality and yield, walnut during unified purchase do not conform to the requirements of the

company (Fogel, 1999), lead to farmers and company's interests are damaged. Lv-Ling poverty alleviation mode into a company + base + technicians + farm households in early 2012.

Discussion 2:

Transition of poverty alleviation: The same of two modes is company work form and contracting orchard form; the difference is changing the premise of the poverty alleviation mode after contracting the orchard. Base by trees area is divided into four units (Roberta, 2002), by working in a company for two years or more skilled workers hired base manager management, farmers around trees, just as workers management do walnuts from planting, fertilization, pruning, grafting, peeling technology, scale, intensive management. In this mode, the base of managers and technical personnel has played a vital role, as a bridge between leading enterprises and farmers ultimately achieve multi-win-win situation.

Transformation of the green ridge poverty alleviation effect is remarkable. Base farmers income growth rate, company working income growth rate, technical personnel income growth rate are 62.5, 31.6, 42.9%, respectively (Fig. 2); base farmers growth rate, technical personnel growth rate are 61 and 62% (Fig. 4); Green area 900% (Fig. 5); the output value, net profit and sales revenue growth rate are 129, 117 and 129%, respectively (Fig. 6).

CONCLUSION

Through the data analysis of Lv-Ling model of poverty reduction, found that it has an obvious effect to promote the local industrial structure adjustment, promote the farmers income and improve the ecological environment. Stimulating the development of transportation, logistics, catering, tourism and other industries. Lv-Ling model of poverty reduction has an obvious effect in Lincheng show that taihang shallow hilly land can draw lessons from the model for poverty

alleviation. Aimed at leading industry of the region, closely around the market demand both at domestic and international, make full use of local resources advantage, traditional advantages and location advantages, vigorously promoting the construction of large-scale, standardization, branding and marketization, cultivating market potential big, obvious regional feature, high added value leading products and leading industry, strengthen walnut processing base construction, adhere to a high standard construction and production, so as to greatly improve the whole strength and poor rural economic comprehensive competitiveness.

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