Volume 19 Issue 39
Originally issued as B6



Global Journal of Management and Business Research: B
Economics and Commerce
Volume 19 Issue 6 Version 1.0 Year 2019
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4588 & Print ISSN: 0975-5853

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Keywords: *solow-swan model, contiguous destitute areas, precise poverty alleviation.*

GJMBR-B Classification: *JEL Code: F63*



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Mechanisms and Countermeasures of Precise Poverty Alleviation in Contiguous Destitute Areas A Study based on Solow-Swan Economic Growth Model

Linna [α] & Zhengxia Tang [σ]

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I. Introduction

Eliminating poverty is one of China's important strategic tasks and China has successively implemented the National Seven-Year Poverty Alleviation Program, China Rural Poverty Alleviation and Development Program 2001-2010 and China Rural Poverty Alleviation and Development 2011-2020 and made notable progress in poverty alleviation and poverty since the reform and opening-up. According to estimates based on the current national rural poverty standards, the poverty incidence among rural residents registered 97.5% and rural poor population reached 770 million in 1978; in 2015, rural poor population reduced to 55.75 million and the poverty incidence fell to 5.7%, much lower than the data in 2014 (see Table 1)[1].

Table 1.1: Status of Poverty in Rural Areas Measured by the Current Standards

Year	Poverty incidence (%)	Size of poor population (in 10,000 people)
1978	97.5	77039
1980	96.2	76542
1985	78.3	66101
1990	73.5	65849
1995	60.5	55463
2000	49.8	46224
2005	30.2	28662
2010	17.2	16567
2014	7.2	7017
2015	5.7	5575

Meanwhile, China's poverty has new characteristics. Firstly, contiguous poverty is observed at provincial borders. As planned in China Rural Poverty Alleviation and Development 2011-2020, 14 contiguous destitute areas, including Liupan Mountain Area, Qinba Mountain Area, Wuling Mountain Area, Wumeng Mountain Area, Yunnan- Guangxi- Guizhou Rocky Desertification Area, West Yunnan Border Mountain Area, Southern Foothills of Great Khingan Mountains, Yanshan Mountain-Taihang Mountain Area, Lvliang Mountain Area, Dabie Mountain Area and Luoxiao Mountain Area as well as Tibet, Tibetan areas in Sichuan Province and South Xinjiang where special policies have

[1] Source: Official website of National Bureau of Statistics.

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been explicitly implemented, should be regarded as main battlefields of poverty alleviation, altogether 680 counties involved.[2] These areas are characterized by severe natural conditions, undeveloped infrastructure, long distances from central cities and lack of a sound market system. Secondly, contiguous destitute areas are mostly inhabited by minorities and 11 out of the 14 areas, except Lvliang Mountain Area, Dabie Mountain Area and Luoxiao Mountain Area, are minority areas. Statistics show that the 11 areas cover 373 poverty-stricken autonomous counties, accounting for 54.85% of the total number of poor counties in contiguous destitute areas.[3] Thirdly, different contiguous destitute areas vary in cause of poverty and environment and the situation even varies greatly from household to household. During an investigation in Hunan Province, General Secretary Xi Jinping proposed the anti-poverty policy of precise poverty alleviation based on the poverty status quo, which has been fully put into effect since 2012, with a view to precisely identifying, assisting and managing targets of poverty alleviation through scientific and effective procedures. China is increasingly concerned about poverty alleviation and is determined to complete the building of a moderately prosperous society by 2020, with specific tasks defined in the 13th Five-Year Plan (FYP).

Solow-Swan economic growth model analyzes the dynamic mechanism of economic growth from perspectives of capital, technology and labor. It is believed that an economy will be long in a steady state without external impacts or significant changes. Based on this view and in the light of characteristics of poverty in China's contiguous destitute areas, this paper suggest that these areas are currently in low equilibrium as described by Solow Model while precise poverty alleviation can impact such low equilibrium, so that it can jump to a better level and a higher steady state. Contiguous destitute areas should seize the opportunity to improve their self-development capacity and achieve the best development. Finally, the paper puts forward specific countermeasures by drawing international experience in poverty alleviation.

II. Literature Review

a) *Economic growth and China's anti-poverty*

Development economists believe that the history of mankind is a process of constant development and poverty elimination. Adam Smith, the father of economics, was the first to study economic development, but the concept of anti-poverty was not directly proposed by the research at that time. It was not until 1800 or so, when both world population and per capita income had stagnated for quite a long time, that Braudel (1920) put forward the "Malthusian Trap" to describe the situation. Later, this equilibrium was broken by the Industrial Revolution, enabling the economy to take off, and many economists such as Harrod-Domar (1939) and Diamond (1997) began to study how the economy could step out the "Malthusian Trap" under market conditions and enter the development stage. John Maynard Keynes (1936) argues that the free market is not always effective and economic development requires government intervention. Later, Robert M. Solow (1957) believes that economic growth consists of labor, capital and technological advances.[4] The development gap between countries and regions was gradually widening due to different factors of production they had. At the end of the 19th century, scholars like Rowntree began to focus on slowly developing economies and put forward the concept of poverty. In the 1990s, Amartya Sen summed up characteristics of poverty, analyzed the mechanism of poverty from the perspective of rights and therefore broke new ground in the measurement of poverty.[5] Angus Deaton (2015) believes that the answer to how to "shake off poverty" should be derived from the nature of political institutions and the quality of their services: "shaking off poverty" requires efficient governance and rule of law, effective tax system and property rights protection, and public confidence, among others[6]

The research on anti-poverty is accompanied by the course of poverty alleviation and development in China, mainly following the implementation of the reform and opening-up. In the light of the implementation of poverty alleviation in different stages, scholars such as Jiang Wansheng and Song Jianxin (2011) believe that the anti-poverty campaign simply involves: the stage of pushing poverty alleviation through structural reforms from 1978 to 1985, the stage of large-scale focused poverty alleviation from 1986 to 1993, the crucial stage of poverty alleviation from 1994 to 2000 and the new stage of poverty alleviation and development from 2001 to 2011.[7] On this basis, there is one more stage, i.e., the stage of precise poverty alleviation mainly in contiguous destitute areas from 2011 to this day and beyond. Zheng Changde (2016) argues that contiguous destitute areas inhabited by minorities experience low level of economic development and are the most underdeveloped of the underdeveloped in China.[8]

[2] Zheng Changde and Shan Depeng. Report on Regional Development and Poverty Alleviation in Contiguous Destitute Areas Inhabited by Minorities [M]. Beijing: China Economic Publishing House, 2014: 8-10.

[3] Zheng Changde and Shan Depeng. Report on Regional Development and Poverty Alleviation in Contiguous Destitute Areas Inhabited by Minorities [M]. Beijing: China Economic Publishing House, 2014: 8-10.

[4] Thomas Karier. Intellectual Capital Forty Years of the Nobel Prize in Economics [M]. Cambridge University Press. 2011.

[5] Wang Zhibiao. Review on Poverty Thought of Amartya Sen [J]. Journal of Beijing University of Technology. 2015, 9.

[6] Angus Deaton. Price Indexes, Inequality, and the Measurement of World Poverty. American Economic Review 2010, 100:1, 5–34.

[7] Wang Hongtao. Study on Rural Anti-Poverty in West China [D]. Minzu University of China. 2013, 5.

[8] Zheng Changde. On the Construction of the Self-Development Ability

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b) Research on precise poverty alleviation

Since General Secretary Xi Jinping proposed the policy of precise poverty alleviation in 2013, the idea of precise poverty alleviation has become the guideline for anti-poverty in the new era (Tang Renwu, 2015)[9]. Wang Sangui (2015) believes that precise poverty alleviation is a necessary measure to offset the decline in poverty reduction and will become a main approach to rural poverty alleviation in China.[10] According to the research on relevant reviews (Gong Yanyong, 2015), precise poverty alleviation is mainly found in news reports on interpretation of the precise poverty alleviation policy and introduction to local experience and achievements in precise poverty alleviation.[11] Relevant papers summarize some problems in precise poverty alleviation in rural areas, analyze main causes of poverty and put forward corresponding countermeasures and suggestions, like strengthening the construction of grassroots Party organizations (Kong Debin, 2015), purchasing social services from independent third parties (Deng Weijie, 2014) and establishing a mechanism for allocation of poverty alleviation resources that responds to people's needs and tilts towards the unprivileged (Zheng Baohua, Jiang Jingmei, 2015). Many other papers mainly sum up local precise poverty alleviation and study relevant practices. Yang Bo (2015) stresses the role of the Internet and big data in precise poverty alleviation in Gansu while Feng Mingyi (2015) studies precise poverty alleviation in Wumeng Mountain Area.

c) Research review

The theory of economic growth analyzes the economy as a whole and is dominated by views of western scholars. China's anti-poverty path is, relative to the poverty in other countries and unbalanced development at home, a process of how to achieve rapid development. The research on precise poverty alleviation further narrows the object of study, but still falls into the scope of the theory of economic growth by its nature. It mainly deals with how to achieve great-leap-forward development with government intervention. However, current research studies precise poverty alleviation from the perspective of relevant phenomena by summing up problems in specific areas, analyzing causes and bringing forward countermeasures, rather than probe into the mechanism of precise poverty alleviation in details.

III. Mechanism of Precise Poverty Alleviation based on Solow Economic Growth Model

a) Concept and connotation of precise poverty alleviation

Precise poverty alleviation is a countermeasure proposed by General Secretary Xi Jinping based on poverty status quo and is the opposite of extensive poverty alleviation. As defined by Wang Sangui, precise poverty alleviation is an approach to poverty elimination whereby targets of poverty alleviation are precisely identified, assisted and managed through scientific and effective procedures according to the environment of different poverty-stricken areas and the situation of different poor rural households; it is a measure and the mainstream means of poverty alleviation.[12] Precise poverty alleviation is intended to guide optimal allocation of various poverty alleviation resources, provide villages and households with access to poverty alleviation, gradually establish a long-term mechanism of poverty alleviation and thus lay a solid foundation for scientific poverty alleviation. Amartya Sen believes that the concept of poverty must contain two different elements, namely identification of poverty and aggregation of poverty. Identification of poverty means selecting the poor from the total population by some means; while aggregation of poverty means reflecting general characteristics of the set of the poor with certain methods.[13] As indicated by its concept, precise poverty alleviation involves not only selection and aggregation, but also implementation of corresponding measures according to aggregate characteristics to help the selected people out of poverty. The main purpose of the paper is to achieve the goal of poverty alleviation and economic growth through targeted measures to alleviate poverty based on aggregate characteristics of poverty. Poverty is a state that reflects low income, low consumption and less education...and can be likened to inertia one can hardly get rid of. It corresponds to low equilibrium in Solow-Swan Model, so poverty alleviation is a difficult task and tends to be in a steady state without external impacts. Meanwhile, poverty is also a process and numerous poor people have shaken off poverty through their own efforts, relatives' assistance and government support, but some are still in poverty, so precise poverty alleviation is necessary, which can push the steady state to a higher level through external forces such as capital, labor and technologies.

in Chinese Ethnic Minority Regions [J]. Ethno-national Studies. 2011, 4.

[9] Tang Renwu. Interpretation of Xi Jinping's Thought on Precise Poverty Alleviation [N]. People's Tribune. 2015, 10.

[10] Wang Sangui and Guo Zihao. On China's Precise Poverty Alleviation [J]. Guizhou Social Sciences. 2015, 5.

[11] Gong Yanyong. Research Review on Precise Poverty Alleviation [J]. Journal of Shandong Agricultural Administrators' College. 2015, 3.

[12] Wang Sangui and Guo Zihao. On China's Precise Poverty Alleviation [J]. Guizhou Social Sciences.2015, 5.

[13] Wang Zhibiao. Review on Poverty Thought of Amartya Sen [J]. Journal of Beijing University of Technology. 2005, 9.

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b) Dynamic equilibrium of Solow-Swan economic growth model and analysis of influencing factors

1. Solow-Swan Model

Solow-Swan Model established by American economists R. Solow and T. Swan based on the classical theory of economic growth suggests that economic growth generally tends towards equilibrium. Problems to be solved include: what determines economic growth and the trend of economic growth, why there is an income gap between countries or regions and whether a poor country can catch up with a rich one. The production function is:

$$Y(t) = F(K(t), A(t)L(t))$$

Where, $Y(t)$ standards for yield, $K(t)$ stands for capital, $L(t)$ stands for labor, $A(t)$ stands for the effectiveness of knowledge or labor and t stands for time. Additionally, $A(t)L(t)$ stands for effective labor and means the role of technology is labor enhancement. Capital, labor and technology jointly determine economic growth and $A(t)$ is multiplied by $L(t)$ to influence $Y(t)$; three conditions are met at the same time: firstly, the marginal product of each input is positive and on the decrease; secondly, returns to scale are constant; thirdly, Inada conditions are met:[14]

$$f(0) = 0,\ f'(k) \succ 0,\ f''(k) \prec 0$$
$$\lim_{k\to 0} f'(k) = \infty, \lim_{k\to\infty} f'(k) = 0$$

Due to constant returns to scale $F\left(\frac{K}{AL},\ 1\right) = \frac{1}{AL}F(K,\ AL)$, $\frac{K}{AL}$ stands for the average amount of capital per unit of effective labor and $\frac{F(K,\ AL)}{AL}$ means the average yield per unit of effective labor. Given $k = \frac{K}{AL}$ and $y = \frac{Y}{AL}$, then $y = f(k)$. See Fig.3-1 for the graph of the function.

2. Steady state in Solow economic growth model

In Solow Model, changes in labor and knowledge are exogenous, so change in per capita capital is a main variable to be considered. Changes in production input and labor and knowledge grow at a constant rate, with labor growth rate expressed as n, knowledge growth rate as g, the proportion of the yield used for investment as s and capital depreciation rate as δ. Due to $k = K/AL$, the following steady state condition can be obtained according to the chain rule:

$$\dot{K} = sf(k) - (n + g + \delta)k$$

The equation above indicates that the rate of change in the average amount of capital per unit of labor is the difference between the average actual investment per unit of effective labor $sf(k)$ and break-even investment $(n + g + \delta)k$, i.e., investment (social savings) required to keep k at the current level.

According to the analysis in Fig.3-2, $(n + g + \delta)k = sf(k)$, in which case the line $(n + g + \delta)k$ is intersected with the curve $sf(k)$, and the per capita capital and per capita yield at the point of intersection A are k_A and y_A respectively, when the per capita savings exactly equal the demand of break-even investment. To the left of A, the curve $sf(k)$ is higher than the line $(n + g + \delta)k$, indicating that savings are higher than the demand of break-even investment, which will lead to a higher per capita capital k and a higher yield. k will approach k_A until savings for break-even investment finally equal all savings, while per capita capital remains unchanged and economic growth reaches a steady state. The situation is quite the opposite to the right of A. Social savings cannot satisfy break-even investment, so per capita capital decreases at the current level of savings, resulting in a smaller y and finally a steady state. This is the dynamic mechanism of economic growth convergence to a steady state.[15]

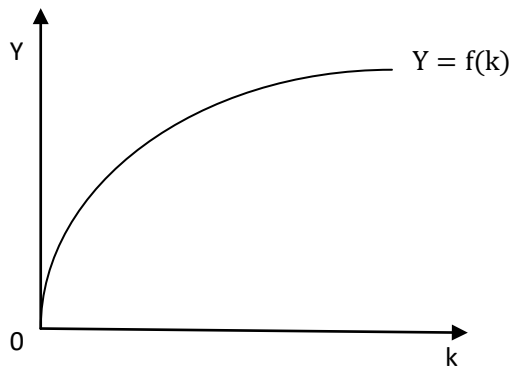

Fig. 3.1: Per Capita Capital-Per Capita Income Curve

[14] Zhang Su. Macroeconomics [M]. Tsinghua University Press. 2014, 8.

[15] Zhang Su. Macroeconomics [M]. Tsinghua University Press. 2014, 8.

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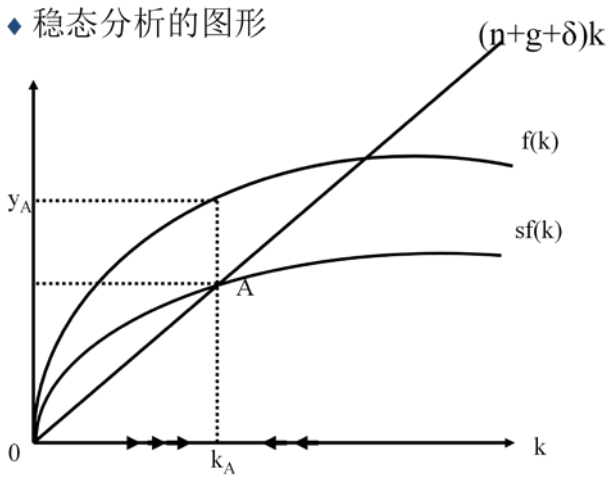

Fig.3.2: Steady State Analysis Chart

3. Analysis of influencing factors

1) Effects of the saving rate on steady state

When per capita capital is very low, capital investment will trigger a process of high economic growth, as $sy > (n + g + \delta)k$, and within the interval of $0 - k_0$ in Fig.3-3, both per capita capital and per capita income will increase until they reach a steady state and converge to k_0; when the initial capital is not very low and stands at C_0, an increase in the saving rate will raise the yield, resulting in a process of high growth. After an increase in the saving rate, $(n + g + \delta)k < s_1 f(k)$, there are surplus savings after capital loss is offset and the actual investment increases and exceeds break-even investment, namely $\Delta k > 0$, thus bringing about a process of continuous economic growth until a new steady state occurs, that is, the level of C_1 (see Fig.3-3). A higher saving rate means more resources for investment, so the line indicating actual investment moves up. The result is the actual investment exceeds effective depreciation, so k continues to rise to a new steady-state value (but not jump to such value). As people save more, the economy will turn from the initial steady state C_0 to the new one C_1, so that per capita capital increases from k_0 to k_1 and per capita yield also increases. Fig.3-4 depicts the dynamic process more clearly. In the upper part, per capita yield changes at t_0 as savings change and reaches at a new steady state at t_1. In the lower part, per capita yield growth rate changes at t_0 as savings change and reaches at a new steady state at t_1.

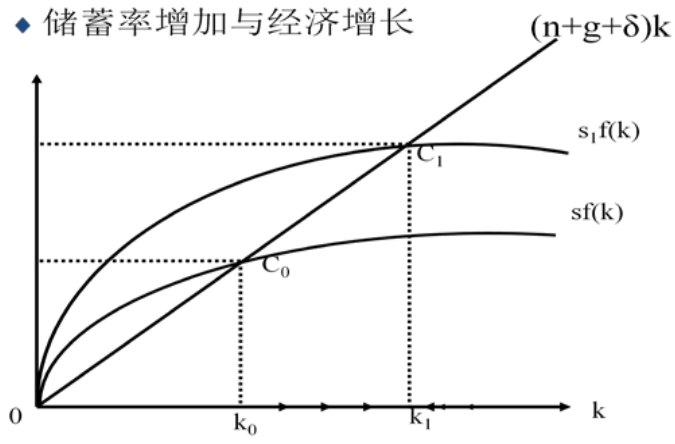

Fig. 3.3: Saving Rate Increases and Economic Growth

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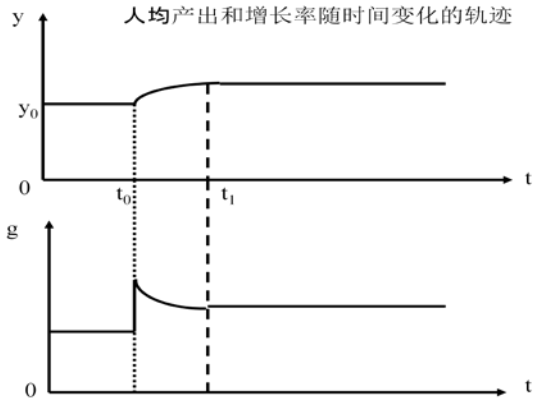

Fig.3.4: Track of Changes in Per Capita Yield and Growth Rate over Time

2) Effects of technological advances on steady state

In Solow Model, the role of technology in economy is labor enhancement. In case of technological advances, in a steady state, the growth rate of per capita capital equals that of per capita income, namely $\frac{\Delta k}{k} = \frac{\Delta y}{y} = g$. The growth rate of economic volume $\frac{\Delta Y}{Y} = g + n$, indicating that an increase in per capita income y leads to a rise in both growth rate of economic volume and per capita income.

3) Effects of labor growth rate on steady state

The steady state of initial capital stock is D. Following the implementation of family planning, population growth rate decreases from n to n'. The depreciation line $(n + \delta)k$ rotates downward to $(n' + \delta)k$, in which case investment exceeds depreciation and k continues to grow until the economy finally reaches the new steady state D_1. (Fig.3-5) At this point, both labor capital and yield increase, but the long-term growth rate remains 0.

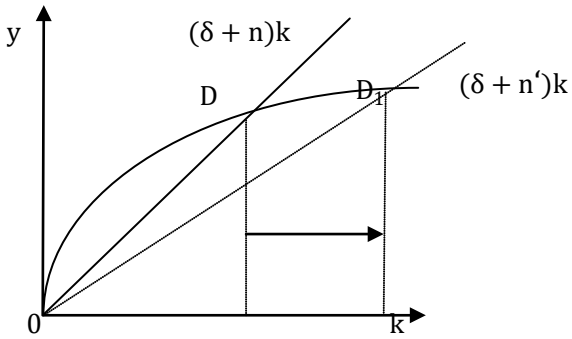

Fig. 3.5: Effects of labor growth rate on steady state

c) *Solow-Swan Model-based analysis of the precise poverty alleviation mechanism*

Solow-Swan Model analyzes the power mechanism for economic growth from three aspects of capital, technology and labor and thinks that the three elements will be steady for a long time when there is no external impact or big change. On the basis of such viewpoint, combining characteristics of poverty in contiguous destitute areas of China, this paper holds that the areas are in a low-equilibrium state as described by Solow-Swan Model, and precise poverty alleviation is an impact to the low equilibrium in the areas, with the purpose of making them transit to a better level. The areas should take this opportunity to improve their development capability and develop to the best level. As shown in Fig. 3-6, poverty is the low equilibrium as Solow-Swan Model describes, and poverty alleviation means to reach a new high steady state under the precise poverty alleviation measures. This may be a progressive process, but more tends toward transition, namely development by leaps and bounds or leap-forward development. Precise poverty alleviation is the mode to realize transition and can be achieved through capital, labor or technology or through joint action of the three elements.

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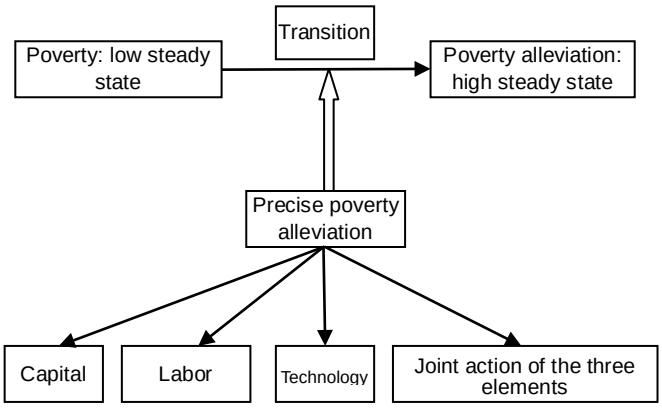

Fig. 3.6: Solow-Swan Model-based precise poverty alleviation mechanism

IV. Countermeasures for Precise Poverty Alleviation in Contiguous Destitute Areas

The program of precise poverty alleviation has been conducted for several years, and the government has made a lot of efforts in the field, particularly in the process of precise identification, but many problems and difficulties remain. After completion of precise identification, the focus will be shifted to precise implementation and management. Due to involving more complicated, professional and long-term works, precise poverty alleviation can be finally implemented in manner of government-third-party cooperation instead of previous government-led implementation. According to Solow-Swan Model, specific measures can be analyzed from the following four points:

a) *Effective use and accurate management of the capital input*

China had made great efforts to develop poverty-alleviation projects, particularly after the program of precise poverty alleviation. Massive human and material resources have been channeled toward contiguous destitute areas. In 2014, the central government appropriated 43.3 billion yuan special for poverty alleviation, up 10% compared with that last year; in 2015, the government budget arranged 46.09 billion yuan of the subsidy for local poverty alleviation works, up 8% on the basis of the amount last year.[16] Great achievements have been made, but many bottlenecks exist, of which funds management and use is one. Relevant case-based analysis is described below.

Case 1: Mayi Village, Lamuajue Township, Meigu County, Liangshan Prefecture, Sichuan Province has the average altitude of 2,515m, covers an area of 3.8 km^2, administrates 5 villagers' groups consisting of 127 farmer households with 573 villagers from Yi ethnic group, and is supported with 744.1 mu farmland. In June 2015, a report by Xinhua News Agency disclosed actual situations of poor and backward life in Mayi Village, such as the great difficulty of getting an education, poor sanitation and man-animal mixed residence and so on, making the Village become a highlight of public opinions and a focus of various social circles and governments at various levels. The government arranged a lot of funds and NGOs and individuals made many donations of funds and goods, with total value of 8.6 million yuan.[17] It was a huge amount of money for Mayi Village, and meant about 70,000 yuan per household on an average. But such inputs for several consecutive years made less distinct effect.

International experiences: The role of a NGO in development –BRAC Model. Bangladesh Rural Advancement Committee (BRAC), established in 1972 by Sir Fazlé Hasan Abed for making up for the deficiency of government and private sector in poverty alleviation, is the largest and most successful NGO in the world. By June 2015, it had reported employees of more than 126 million, about 70% of whom were female. They recognize that poverty in rural area is a long-term and structural problem, focus on education, nutrition, health, credit, lawful rights and other issues of the residents in poor areas, and teach them how to read, think, pool resources and start their undertakings.

China can completely follow the model of BRAC to establish its special NGOs for precise poverty alleviation to manage and guarantee virtuous operation of the funds. The practice of granting relevant funds directly to the poor, regardless of the source from national transfer or donations of social organizations and individuals, is unfavorable for long-term continuity of poverty alleviation. By 2020, when China reaches the goal of finishing building a moderately prosperous

[16] Source: Official website of the Ministry of Finance of the People's Republic of China

[17] Source: Statistical data of Mayi Village, Lamuajue Township, Meigu County, Liangshan Prefecture.

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society in all respects and relevant counties lose the status of poverty-stricken counties, there will be no massive national transfer payments and other sources of funds available, then such areas will be very liable to become poor again. On the other hand, government's management of all funds will cause many limitations. First, government employees are limited, and many of them are not good at funds operation and management. From the assumptions of Solow-Swan Model, savings are not efficient until they are transformed into investment fully. When the funds become savings but cannot be transformed into investment, they will be inefficient for economic growth. In addition, there exists the risk of corruption in government. So establishing sound special NGO is a good choice, through which government can focus their attentions on supervision. Moreover, in view of experiences, NGO can work better in improving motivation of the poor. However, there are many problems in personnel quality, funds source and relations with government of NGOs in China, meaning more efforts needing to be made further.

b) *To speed up improvement of labor's quality and strictly control fertility rate*

First, to greatly improve labor's quality. Precise identification has achieved clear statistics of labor's structure in every area. Basic education is the first task in contiguous destitute areas. Currently, China has popularized 12-year compulsory education, which is very important for future development of the areas; second, to carry out re-education and training of persons with labor capacity. Specific training courses should be carried out according to potential industries in local areas or target areas, in a down-to-earth manner rather than superficially and in a manner of formalism, as such groups serve as leading players in the development of the areas. Only when they are equipped with self-development capabilities can the areas cast off poverty really.

According to the analysis based on Solow Swan Model, increase of labors is efficient for growth of aggregate economy, but cannot increase per capita capital, so rise of population should be strictly controlled. In contiguous destitute areas, many rural families have 3 or 4 children, even more. The 6th national population census data show that Liangshan Prefecture reported the population growth rate of 8.53‰, much higher than 2.31‰ of Sichuan Province and 4.79‰ of China (See Table 1),[18] with the growth of Yi people and poverty-stricken population as main contributors.[19]

Table 4.1: Population Growth Rate of Liangshan Prefecture

Area	Birthrate ‰	Mortality ‰	Natural Growth Rate ‰
China	11.9	7.11	4.79
Sichuan Province	8.93	6.62	2.31
Liangshan Prefecture	14.44	5.91	8.53

First, based on model unreasonableness, the case that more people vie for limited resources is not the most efficient. Meanwhile, more children mean that their parents have no more time for work, leading to decrease of per capita capital. Second, poverty of the families causes no guarantee for health, education and nutrition of their children and adults and poor physical and cultural quality of them. Third, such case increases the possibility of intergeneration transmission of poverty. Human capital investment is very important for casting off poverty. But data show that, compared with high-income families, low-income families are generally unable or unwilling to let their children have higher-level education.[20] Such practice is particularly distinct in contiguous destitute areas. After all, under the situation that basic living needs cannot be met, who is willing to let their children go to school, and how many children can feel at ease to study in school? The fact carries a foreshadowing of continuous poverty and makes precise poverty alleviation more difficult.

Case 2: Changyan Village, Zhenxiong County, Zhaotong City, Yunnan. The Village is in mountain region, more than 110km away from the county seat and 22km from the town, covers an area of 21.40 km^2, enjoys an altitude of 1,400m, average annual temperature of 12.00℃ and annual precipitation of 1,100mm, suitable for growing corn, flue-cure tobacco and other agricultural crops; and is equipped with farmland of 6,465 mu, or per capita farmland of 1.6 mu, without any plot larger than one tenth mu; 924 farmer households and 4,034 residents consisting of an agricultural population of 4,028 and labors of 2,331. In 2013, the Village reported total income of 9.0673 million and farmers' per capita net income of 1,447 yuan.[21] Moreover, the Village is also limited by adverse conditions, completely agricultural population, low productivity, extremely soil, fragile ecological environment and serious soil erosion. All contiguous destitute areas almost face situations of

[20] Zou Wei, Zheng Jie. *Why do Children from Poverty-stricken Families not Go to School: Risk, Human Capital Intergeneration Transmission and Poverty Trap* [J].Economics Information. 2014 (6).

[18] Data of the 6th national population census.

[19] Zheng Changde. *Study on Changes in Ethnic Minority Population in Liangshan Yi Autonomous Prefecture*[J]. *Northwest Population Journal*. 2008 (4).

[21] Source: Website of Changyan Village Committee, Wanchang Township, Zhenxiong County, Zhaotong, Yunan

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serious ecological degradation and overload of population.

Drawing on the experiences: Mexican "Opportunity" project. Facing severe social poverty and unbalanced regional development, the Mexican government mapped out "Education, Health and Food Program", which was renamed to "Opportunity Program" in December 2001. The core of the poverty-alleviation project lies in "Money for Action", aiming to promote improvement of its human capital level by providing poverty-stricken group with cash subsidy subject to additional conditions, so as to reach the goal of reducing poverty. "Opportunity Program" is the first social policy for poverty alleviation from the angle of human capital investment in Latin America. Based on the starting point that pure economic growth cannot effectively eradicate poverty but human capital plays an extremely important role in eradicating poverty, the Program focused on education, health and food of poverty-stricken population and other fields which may make far-reaching influences on their future. With direct cash subsidy, the Program can stimulate the beneficiaries' investment in education and health of their families while alleviating instant demands of poverty-stricken households, effectively combine short-term goals with long-term ones and give play to human capital to break intergeneration transmission of poverty. The most important innovation of the "Opportunity Program" is that it transforms the sole responsibility of government in poverty alleviation into a common responsibility of the benefited households.[22] Different from traditional subsidy programs under which the beneficiaries received relief fund passively, beneficiaries of the "Opportunity Program" must perform the family agreement concluded with relevant authorities and undertake certain "corresponding obligations". Such practice reflects new breakthroughs in design idea of the Program, relies on "conditional" arrangement to promote poverty-stricken households' investment in education, health and nutrition, and helps improve health and education situations of families, thus to greatly increase possibilities for poverty-stricken population to get more development opportunities.

China's goal of precise poverty alleviation at present is just to arouse the poor's enthusiasm and subjective initiative and transit to "development-oriented" and "blood-making" poverty alleviation from traditional "blood-transfusion" poverty-alleviation approach. How to realize the transition from the sole responsibility of government to the common responsibility of government and the benefited households in precise poverty alleviation? We can follow Mexico's innovative idea of "conditional support", to let poverty-stricken households realize that "waiting, dependence and request" do not work and all supports are subject to their hard works.

c) To support with precise technology

Technology is the most fundamental measure to improve self-development ability of poverty-stricken areas, and the importance of technology can be found in Solow-Swan Model. Precise poverty alleviation in contiguous destitute areas can be started with two aspects: first, technology introduction by establishing industrial park or accepting industrial transfer to expand technology introduction channel. But it is a challenge to poverty-stricken areas itself regardless of regional development conditions or personal quality of local labors; second, labor training and output. Contiguous destitute areas mainly feature mountains with numerous gullies or places restricted from development, hard transport since ancient times and other infrastructure poorer, forming extremely adverse conditions for economic development in the areas, particularly in high-altitude Yi-people villages like Mayi Village, which are in the situation of being deeply marginalized due to remote geographic position and more backward transport conditions. Therefore, it is impossible to promote local economic development by introducing technologies and labor training and output is more practical. Relevant training can be based on personal wish and be carried out through other channels besides government. Considering very high quantities of work, in order to guarantee efficiency and quality, what the government needs to do is to build an enterprise-poor people coordination mechanism, under which enterprises or social organizations can carry out job-oriented training and thereby enjoy some subsidy. Naturally, the precondition for the practice is the long-term coordination mechanism of poverty alleviation between government, enterprise and individual.

The role of rural women in precise poverty alleviation cannot be ignored, and improving poor situation of rural women is a strategic key link in eradicating poverty. Women undertake tasks of population reproduction, household duties and increasing family income. Situations of women first influence birth behavior and quality, and poverty of women is directly related to rise of fertility rate, fall of educational level and deterioration of family environment, and leads to intergeneration transmission and vicious circle of poverty.[23] For this reason, it will be one of keys for successful precise poverty alleviation to give play to advantages and roles of rural women in precise poverty alleviation as far as possible.

[22] Michael P. Todaro. Translated by: Nie Qiaoping, et al. *Economic Science Classics Series: Economic Development (11th Edition)*. Beijing: China Machine Press. 2014 (4).

[23] Liu Xin. *Summary of the Studies on Women Poverty in China over the Past 40 Years* [J]. *Collection of Chinese Women's Studies*. 2015 (1).

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d) To establish central towns

Funds support, population quality improvement and technology support are the analysis results based on Solow-Swan Model. In practice, joint action of the three elements is the most effective. Contiguous destitute areas has too low urbanization rate, about 20% generally, and many rural areas are far from urbanization at all. Due to scattered residence in mountains, not all families and farmers can be benefited by road, hydropower station, hospital, school and other public goods and public services. They have very poor residential and sanitary conditions, no access to highway and relatively closed living area. Central towns can actively encourage poverty-stricken households far from towns to move to local county seats or towns as the nodes and carriers for development. Migration and relocation, though subject to many queries and occurrence of some problems in practice, is undeniably an effective measure for development-oriented poverty reduction. It can expand migrants' living and exchange space, serve as a people-centered practice, change their income structure, and make them go out of the complete farming and closed space. However, establishment of central towns should ensure follow-up interest security of the relocated farmers, centralized construction of education, health and other living infrastructure and lower transport cost.

V. Conclusions

In China, contiguous destitute areas are main theaters to poverty alleviation and precise poverty alleviation is the main measure in the field. By analyzing the precise poverty alleviation mechanism through three dimensions of funds, technology and labor in Solow-Swan Model, this paper reveals that such areas are still at a low-equilibrium level. To take the opportunity of precise poverty alleviation to realize leap-forward economic development, we must carry out effective use and accurate management of the capital input, speed up improvement of labor quality, strictly control fertility rate, provide precise technology support and establish central towns.

Precise poverty alleviation is the main measure that may help contiguous destitute areas realize economic development from low equilibrium to high equilibrium. Poverty is not only an economic issue, but includes multi-dimension angles of society, culture and ecology. Therefore, precise poverty alleviation cannot be limited to only emphasis of economic growth, though it is undeniable that economic growth is the most important way to address poverty. In the process of economic transition, poverty-stricken areas will face many active or passive factors and meet many difficulties and problems, but in the long run, precise poverty alleviation will surely be favorable for contiguous destitute areas and future development of China.

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