

Smart tourism and poverty reduction

Shiyi TAO

National University of Public Service, Budapest, Hungary

E-mail address: shiyitao1993@gmail.com

Abstract

Rural poverty has constrained the social and economic development in China. Tourism is a driver for positive change, which plays a significant role in delivering sustainable solutions for people, the planet, prosperity and peace. Smart tourism is a new model of tourism informationization based on cloud computing, the mobile terminal application as the core and characterized by interactive and other efficient information services. Smart rural tourism poverty reduction is one of the most effective ways to achieve targeted poverty reduction. With the increasing integration of “Internet + tourism”, tourism has entered smart era. This study tries to analyze the application of the smart tourism, and examines the benefits to targeted poverty reduction in China. The main methodology is case study based on the operation of “Smart tourism supporting poverty reduction platform in Chengdu.” The findings as follows: smart tourism effectively solve the problems such as backward infrastructure, serious homogenization, extensive operation, lack of service concept and lack of brand concept in rural tourism development; build smart rural tourism data center and application platform to provide intelligent management system to farmers; rural tourism system as the foundation, improve the intelligent management, marketing and service of rural tourism, and promote the sustainable development. Results may be useful for government institutions, NGOs and companies as well. This study has the referential value in the targeted poverty reduction process in China, through the analyse of the latest smart tourism platform can find the current advantages and defects and make up for flaw timely. Last but no least, in order to better reduce poverty and implement smart tourism, some recommendations to the government such as continuously implementing digital transformation, government as a lead organization to coordinate all players to share tasks together, introducing explicit policies enables consistent execution of government at all levels.

Keywords: rural tourism economy, sustainable development, digitization, China.

1. Introduction

Tourism is a driver for positive change, which plays a significant role in delivering sustainable solutions for people, the planet, prosperity and peace. In 2018, the world tourism day highlights the need for investment in digital technologies that can help creating innovation, entrepreneurship. Well-organized tourism opens the door to job cultural preservation, environment protection, economic growth and security. The digital transformation is about providing benefits for all and tourism can contribute to the global commitment.

“Smart tourism” is a new proposition. It is a kind of application such as Internet of Things, cloud computing, next-generation communication network, high-performance information processing, intelligent data and other technologies in the aspects of tourism experience, industrial development and administrative management. It systematically integrates and deeply develops and activates the tourism industry’s physical resources and information resources. It is based on the integrated communication and information technology, centered on the interactive experience of tourists, and is supported by integrated industry information management, which is characterized by stimulating industrial innovation and promoting industrial structure upgrading. Smart tourism is the use of mobile cloud computing, the Internet and other new technologies, the portable terminal Internet devices to actively perceive the travel-related information, and timely arrange and adjust to travel

plans. Simply put, visitors interact with the network in real time, allowing the tour to enter the touch era.

Among them, smartphones and tablet PCs will be the next stage of the force. The combination of tourism and cloud computing (grid computing) from the policy level, as the subject of priority development of the information industry, also shows that the tourism information platform based on cloud computing technology is the basis of smart tourism. The “smartness” of smart tourism is reflected in the three aspects of “tourism service”, “tourism management” and “tourism marketing”. Smart rural tourism poverty reduction is one of the most effective ways to achieve targeted poverty reduction. With the increasing integration of “Internet + tourism”, tourism has entered a new era of intelligence. Rural tourism poverty reduction needs to shorten the distance from the city through “Internet +”; it also needs to realize all-round, three-dimensional and meticulous management of the production, management, marketing and publicity of agricultural products through intelligent management means; Realize the green, health, leisure and entertainment in rural areas, and push them to the cities through rural tourism and tourism e-commerce. At the same time, by creating regional characteristics to attract more tourists to choose the countryside to feel the leisure and free rural life; encouraging the special activities of rural makers, and implementing the special action of poverty reduction model to achieve targeted poverty reduction. Through the comprehensive effectiveness of tourism, explore the road to sustainable development.

This paper analyzes the application of the smart tourism, and examines the benefits to targeted poverty reduction in China.

2. The concept of smart tourism

The concept of “Smart Planet” and “Smart Cities” proposed by IBM(International Business Machines Corporation) are the products of “technological era”. “Smart tourism” is one goals of “smart city”. Tu and Liu [1] summarized four inevitabilities from literature, first, the demands of tourism market ask for smart tourism [2], in order to meet diverse needs of tourism information [3], [4]. Second, smart tourism is an effective measurement for tourist attractions [3]. Third, smart tourism is the requirement of tourism industry to improve the tourism information management of enterprises, authorities, local governments. Fourth, smart tourism is an inevitable trend of industry upgrading [2].

Before 2000, a very small number of scholars researched on the smart tourism. After 2000, the overall trend of scholars on smart tourism research has increased year by year. Experts and scholars in tourism, information, e-commerce and other related fields have started from their own majors, and have carried out different research on the technology and product market of smart tourism, bur the results have been scattered. The system of smart tourism is supported by cloud computing, GIS, and the Internet of Things. The CAA framework system of smart tourism believes that the key issues of smart tourism consist of three aspects: capabilities, attribution, application, which are mainly used to clarify the development subject, application subject and operation subject. China's research on smart tourism mainly includes four aspects, the study of theoretical system construction, the study

of smart tourism participants, the empirical analysis of smart tourism, and the development of smart tourism.

Chinese scholars put forward ten questions for smart tourism, pointing out that the current infrastructure of smart tourism is weak and lacking. When discussing the theoretical issues of smart tourism and the concept of smart tourism, the definition of smart tourism is proposed: smart tourism is based on a new generation's information technology, in order to meet the individual needs of tourists, provide high-quality, high-satisfaction services, and achieve systematic, intensive management changes in tourism resources and social sharing and effective use. Zhang clearly pointed out the four core competencies of smart tourism: Internet of Things, mobile communication, cloud computing, artificial intelligence; built a CAA framework system and application model to solve a series of research on smart tourism. The application model is mainly to clarify the four main participants of smart tourism: government, local community residents, enterprises, and tourists [5].

The concepts related to smart tourism in the existing research literature are mainly explained by referring to the concept of smart city. The more representative definitions are as follows. Peking University Tourism Research and Planning Center conducts research from the perspective of smart tourism service objects, purposes, and new technologies in tourism, industrial development, and administrative management. Yao, Ding, Zhou, Han Liu, et al think that smart tourism is the best form of tourism development, and smart tourism is committed to providing tourism services and experience for tourists [6].

Most western scholars define the smart tourism mainly focus on the sustainable development of tourism and the deep participation of tourists. From the literature, it is found that there are certain differences in the perception of smart economy at home and abroad. Domestically, it is more inclined to apply information technology to tourism. Western views tend to weaken technology, and highlight the sustainable development of tourism and the care of tourists.

The development of information and communication technologies has changed the conventional strategy of tourism and the industrial structure. A new way of tourism informationization to meet the ever-changing consumer behavior, thereby enhancing the overall value chain of tourism. In recent years, Chinese scholars have also proposed the construction of perception systems, cloud solutions [7], [8]. More scholars from different data technologies such as big data technology, cloud computing Internet of things, etc. analyze smart tourism and provide technical support for the development of smart tourism.

The western scholars have started research on smart tourism systems since the beginning of the 20th century. The system involves all-round improvement of tourism. First, for the improvement of tourist information collection and transmission, Belz and other scholars analyze the CRUMPET system, spans fixed and mobile networks so as to quickly create stable, scalable access to travel service agent technology, and evaluate what effective information services users need [9]. Kanellopoulos and Kotsiantis propose tourism in the time of smart wireless network services and travel mobile communications [10]. Mrnjavac

and Marsanic discuss the tourism product development application in the context of smart systems [11]. Croatian scholars believe that the smart systems can provide better information, improve traffic and travel flows, cargo transportation, which has a greater impact on European IST project applications, and promotes the use of 2.5/3 g cellular mobile networks with LBS. Robert explores the construction of a smart transportation system from the perspective of improving the traffic flow of tourist destinations [12]. Ricci and others believe that the generation and change of value based on the technological innovations with global positioning services and web 2.0 drive, affecting the creation, exchange and evaluation of tourism information, and forming a more convenient tourism model [13]. In addition, Jordanian scholar Owaied et al. propose a model for guiding the smart tourism system [14].

The research of China's tourism information system mainly focuses on: multimedia information, management, planning, interpretation, destination information, website and e-commerce, early warning, experts and other systems. Some scholars use the tourism market [15], construction difficulties [16], positioning [17] discuss smart tourism.

3. The status quo of poverty reduction in China

There are over 700 million people living in extreme poverty [18]. For many families, having a warm house, enough food and secure jobs, is still a distant dream. Globalisation has enabled many to realise their dreams. It has given hundreds of millions a renewed sense of hope. Poverty is a phenomenon that has always existed in the process of human social development. How to make poverty reduction resources better focus on the disadvantaged population is a question of worldwide. Since the reform and opening up, China has lifted hundreds of millions of rural poor people out of poverty through government-led and large-scale poverty reduction projects. It has become the first country in the world to achieve the UN Millennium Development Goals and halve poverty. It has created a Chinese miracle in the history. Since the 18th National Congress of the Communist Party of China, President Xi has proposed and systematically explained the idea of targeted poverty, and has actively implemented the 2020 "poverty-stricken populations and counties achieve poverty reduction". From 2013 to 2016, a total of 55.64 million rural poor people in China were lifted out of poverty. Targeted poverty reduction highlights the national governance capacity, and contributes to China's wisdom and inclusive development of the world.

Targeted poverty reduction is a relative concept of extensive poverty reduction. Its essence is actually to implement policies and resources to the poor. Therefore, it is mainly composed of three links, namely, targeted identification, targeted assistance and targeted poverty reduction. Targeted poverty reduction is of great significance to the future development. It has four main areas: innovative poverty reduction development path, innovative poverty reduction resource use mode, innovative poverty reduction development mode, innovative poverty reduction evaluation system. It is also necessary to establish an effective supporting working mechanism to enable poor households to truly benefit from the work. For example, the government needs to reform the formulation of poverty standards and establish a mechanism to accurately identify the poor. Second, the process of targeted assistance should be tailored to local conditions. On the basis of accurately identifying poor households, and getting to know who are the poor, we must

provide precise assistance through the formulation of targeted policies. Third, the government should ensure the transparent management of projects and funds, and the information feedback system is smooth. Accurate management has become an important guarantee for targeted poverty reduction. The implementation of precise management can enable government departments to timely discover the defects and make up for it. Fourth, establish a green poverty reduction concept as part of a sustainable development strategy. In addition to using all policies to achieve poverty reduction, strategy should be based on scientific and green poverty reduction in the new era. With the completion of a well-off society in a comprehensive period, the task of poverty alleviation has become more and more arduous, and it has gradually entered the sprinting period. Various participatory poverty reduction and development work through education poverty reduction, industrial poverty reduction, health poverty reduction, and village promotion have been carried out. The future poverty reduction work may face many challenges and problems, which will bring new opportunities for China's development.

In addition, in poor areas, the management of poor households and the management of poverty poverty teams are difficult points in poverty poverty work. “Year poverty all year round” is a realistic problem of management difficulties. The situation of poverty-stricken areas and poor households is complex and variable, which is difficult for local government to manage. It is difficult for staff to accurately grasp the information of the poor population, and it is necessary to provide targeted solutions for different situations. Besides, there are many people involved in the assistance, the number of visits and steps need to be managed, and the personnel assessment criteria need to be clear. Although local governments have made various efforts to solve difficulties in poverty reduction work, but they have heavy tasks in the tight working hours. Only by adjusting the ways and means of poverty reduction work can promote the results of work as soon as possible. With the digital technology and big data platforms, it is possible to more effectively grasp information and accurately analyze data, which is becoming an effective means to help the poor. The 1.0 era of government poverty reduction work relies on people. A large number of staff carry out peer-to-peer poverty reduction work. With the advent of the era of communication and the Internet, the work has entered the 2.0 era. At this time, human brain + computers have improved the efficiency of poverty reduction through data storage. The advent of the mobile Internet era has promoted the government's poverty reduction work into the 3.0 era. It can rely on the use of Internet and big data analysis tools to make poverty reduction work more “lightweight” and complete the integration of data, statistics, feedback and other basic work through the mobile terminal + database. Two questions are put here: How digital technology and smart solutions can help poverty reduction in general and how they can help the government's work on poverty reduction. The poverty reduction staff will manage the poor households and their behavior more effectively, so that they have more time to go deeper into more poverty-stricken areas, understand the actual needs of the poor and solve problems accurately. As a 3.0 era with tremendous changes in the poverty poverty model, this complex system needs to rely on Internet thinking and comprehensive policies. After becoming a platform for many organizations to improve their work accuracy, intelligent management software is being used for the government's poverty reduction work, becoming a new weapon in work management, achieving accurate poverty reduction and benefiting poor people quickly.

4. Poverty reduction and tourism industry

4.1. Analysis on the opportunity of all-for-one tourism

China's tourism industry has now entered the era of “mass tourism” and “all for one tourism”. The "all-for-one tourism" has the characteristics of national tourism, personal travel, self-driving tour and so on. Homogeneous tourism products are not sufficient to meet the needs of current tourists. The differentiation will bring new driving force for the development of tourism, and truly realize the development of regional economy driven by tourism. The poverty reduction work in the era of all-for-one tourism is mainly carried out through the ideas of “drive, support and cooperation”.

“Drive”: The scenic spot drive the industrial development and encourage people to lift themselves out of poverty. In the greatest concentration of impoverished villages, the people can be involved in the development of relevant tourism industries. At the same time, taking poor households as the main body and cultivating farmers engaged in tourism-related industries.

“Support”: One refers to upgrading infrastructure. In the process of poverty reduction in the scenic spot, the infrastructure construction of the scenic spot will be upgraded to enhance the carrying capacity of the scenic spot. The second is to support the characteristic industry. Give full play to local characteristics, combine tourism with Internet e-commerce, hold tourism special industry festivals, and support the development of tourism industry.

“Cooperation”: It refers to the integration of financial policies and the integration of “tourism + poverty reduction” work. Integrate funds and policies, and the agriculture-related funds will be prioritized in tourism poverty reduction, strive for financing loans, and implement financial poverty reduction policies. Meanwhile, increase the weight of tourism poverty reduction in the comprehensive assessment, and promote the same deployment, promotion, supervision, and rewards and punishments.

4.2. The technical architecture of all-for-one tourism [19]

Smart tourism is one of the typical applications of the information era and big data era. The whole system is divided into four levels: data production, data access, data fusion and data consumption:

The data production layer can also be understood as the active perception layer. It is necessary to make full use of the Internet, Internet of Things, and various types of acquisition terminal of the communication network, and the tools of collection, so that the data is widely used and the scope is maximized. The users are “producing data” for system while they are using the services.

The data access layer, that is, the network layer integrates access advantages of the communication network, the Internet and the Internet of Things.

The data fusion layer, namely the smart tourism application platform and the smart city big data cloud platform, including the data center platform based on cloud computing and big data technology, and various application platforms.

The data consumption layer, that is, the application layer, builds various tourism application services on the basis of the system platform, directly reflects the purpose of smart tourism, enhances management support capabilities, increases user viscosity, economic efficiency, and promotes regional economic development.

The goal of the smart tourism service platform is to promote positive interactions in consulting, tourism, recreation, accommodation, and business activities. In the end, it will form a smart tourism system integrating navigation, tour guide, shopping guide, sightseeing, leisure and business.

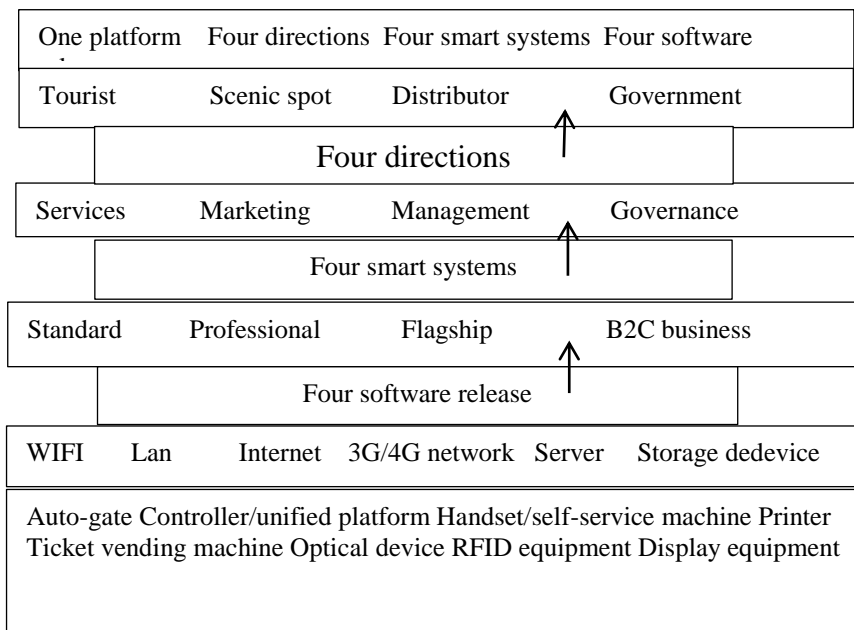


Fig. 1. Technical architecture of all-for-one tourism
 Source: *All-for-one tourism service platform, 2018*

4.3. Analysis on the opportunity of rural tourism

First of all, the role of rural tourism as the main channel for tourism poverty reduction. Give full play to the unique advantages of various rural material and non-material resources, enrich the rural tourism industry and products, develop rural inns with rich rural characteristics, encourage rural collective economic organizations to establish rural tourism cooperatives.

Secondly, innovate the development model of rural tourism and explore the villagers' investment in land management rights, use right of residence base, house property, etc., to promote villagers to increase their income, get rid of poverty, and share the fruits of tourism

development for a long time. Using the “tourism +” and “ecology+” models to promote the deep integration of agriculture, forestry and tourism, education, culture and healthcare. For example, promote the integration of tourism and the primary industry, make full use of agricultural heritage and rural cultural heritage to enhance attractiveness; impel the integration of agriculture, tourism and industry, modern Industry is introduced into traditional agriculture, improving the efficiency of traditional agriculture, enriching the production of tourism products; motivating the integration and development of rural tourism and service industries, and building a platform for the in-depth integration of agriculture, tourism, education, culture, health industries, promoting “rural tourism + sports”, “rural tourism + culture”, “rural tourism + health care” and other industrial development. With “all-for-one tourism” co-ordination and the supply-side structural reform, promote the linkage development of tourism industry and other industries, and finally achieve poverty reduction.

5. Case study of the “Smart tourism supporting poverty reduction platform in Chengdu”

Poverty reduction is not only helping poor people to develop economy and to get rid of poverty but more importantly, improving people's spiritual civilization and political civilization. Smart rural tourism poverty is an optimal path in the present situation, and at the same time it can have an immediate effect. Combined with the characteristics of tourism development, smart rural tourism poverty reduction will be deployed and implemented in the following aspects.

Goals and patterns: The government should raise and secure counterpart funds to transform and upgrade public infrastructure such as road traffic, water conservancy, forestry, and environmental sanitation; the tourism sector should respect the characteristics of different stages of regional economic development, build a complete industrial chain of rural tourism, and make the rural tourism model form a closed-loop ecological environment. Explore the construction of rural tourism demonstration villages with the model of cooperatives + companies + farmers, build a common community of interests with the poverty reduction model of farmers + tourism + e-commerce; encourage villagers to actively participate in the team of tourism to get rid of poverty, increase and enrich the supply of rural tourism products in order to finally realize poverty reduction from tourism.

Plans and steps:

Planning first and making overall considerations: Planning for the construction of smart rural tourism + targeted poverty reduction policy. In the plan, the key construction content and responsibility division should be clearly defined, such as: infrastructure and supporting, informationization, e-commerce platform, agricultural product traceability platform, local characteristics (including agricultural products and tourism characteristics), etc.; The characteristic rural products such as the smart rural tour system and the trunk economy provide the basis and way for targeted poverty reduction.

Guidance by government and participation by all people: The characteristics of smart rural tourism poverty reduction include: poor basic infrastructure, large turnover of personnel, lack of obvious resource advantages, low level of local villagers' education, solidification

of villagers' thinking, long distance from cities, and lack of tourism resource. In response to the particularity of rural tourism poverty reduction, the government departments will shoulder the heavy responsibility of guiding.

Improving the system and cultivating talents: establish a tourism safety management system, improve the assessment system, perfect the tourism fiscal and taxation policies, formulate a tourism poverty reduction system and a safety construction system, establish a inns management system, a complaints system and a credit system, etc. Develop local talent development programs to provide training for local residents to encourage, guide and help them to start businesses and address unemployment. Encourage people to return to the village to support construction, develop innovative projects to broaden channels for tourism poverty reduction, establish a multi-faceted, three-dimensional, sustainable development path, and at the same time monitor development status, timely assess industries with shrinking tendencies, and support a sustainable and responsible development.

Taking advantages and cultivating characteristic industry: combine local characteristics and complete the construction of "all-for-one tourism" destinations. Fully develop the local natural scenery, customs, and inject cultural tourism and sentimental tourism into the smart rural tourism development system, attract more tourists to rest and entertain. Deeply explore the development opportunities brought by "tourism +" and encourage innovation and entrepreneurship to be carried out locally. Sprinkle green, eco-friendly and sustainable features throughout all countrysides. Keep every place develop according to its characteristics and realize the construction of a large tourism pattern with different characteristics.

Chengdu Zhongke Daqi Software Co., Ltd. developed smart rural tourism cloud platform utilizes "smart tourism" resource information to integrate express delivery, various means of operation and promotion, and convenient and fast online services. Effectively solve the problems such as backward infrastructure, serious homogenization, extensive operation, lack of service concept and lack of brand concept in rural tourism development; build smart rural tourism data center and application platform to provide intelligent management system to farmers.

The second step: develop regional characteristics to achieve seamless connection between farmers and smart rural tourism cloud platform. Help farmers to achieve targeted poverty reduction through the transformation of inns, the procurement of agricultural and sideline products and the cultivation of green food bases. Complete the "farmers + tourism + e-commerce" channel to get through.

The smart rural tourism system is developed according to the characteristics of smart rural tourism and poverty reduction. It is committed to helping farmers repair smart tourism highways. Integrate peasant-household tourism, inns, specialty catering and local products into the rural tourism platform, and then realize the function of publicity and distribution through the intelligent function of the rural tourism platform. Let smart rural tourism benefit the villagers and provide accurate access to poverty reduction.

The four advantages of smart rural tourism system:

- Conducive to the intelligent management of rural tourism. It helps the tourism management department to understand the diverse needs of tourists and facilitate scientific decision-making and management.
- Conducive to the intelligent marketing of rural tourism. Timely and accurate to provide tourists with comprehensive and three-dimensional rural tourism consultation, which is convenient for tourists to make online reservations and internet payment.
- Conducive to the intelligent service of rural tourism. It is convenient for tourists to obtain information, set up programs, book online payment for accommodation, etc.
- Conducive to the sustainable development of rural tourism. It will display the rural tourism landscape for tourists in an all-round way, and more vividly show the ecological concept of rural tourism to tourists and deepen the ecological awareness of tourists.

6. Conclusions

Smart tourism effectively solve the problems such as backward infrastructure, serious homogenization, extensive operation, lack of service concept and lack of brand concept in rural tourism development; build smart rural tourism data center and application platform to provide intelligent management system to farmers; rural tourism system as the foundation, improve the intelligent management, marketing and service of rural tourism, and promote the sustainable development. Government as a lead organization to coordinate all players to share tasks together continuously implementing digital transformation introducing explicit policies enables consistent execution of government at all levels.

The “Thirteenth Five-Year Plan” is a crucial period for China to achieve its first 100-year plan. It is a turning point in the transformation and upgrading of the “three-step strategy”. The government vigorously implement the rural tourism poverty reduction project, promote tourism entrepreneurship, standardize the tourism market order, promote civilized tourism, build a tourism safety net, implement a tourism service quality improvement plan, and create a civilized, safe, convenient, comfortable and efficient tourism environment. Rural tourism has become a strategic place for poverty reduction.

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