Cooperative Ecosystem to Empower Small Farmers in the Poor Areas of China: Case Studies of Sichuan

A Report of UoN-GCRF Pilot Project

Bin Wu, Xinhong Fu, Xiyao Wang, Gubo Qi, Zhao Ding, Baojiang Geng, et al.

December 2020
Authorship

Main author: Bin Wu

Co-authors: Xinhong Fu, Xiyao Wang, Shemei Zhang, Gubo Qi, Zhao Ding, Baojiang Geng, Yi Wang, Yun Shen, Yuying Liu

Contributors: Lu Liao, Liping Zeng, Biyi Deng, Chengcheng Cai, Yue Huang, Jingzhi Liang, Jingmei Mo, Yuying Liao, Lei Luo, Jie Peng, Chi Xu, Yong Yang, Daochuan Yang, Jiaxin Zhu, Rui Chen, Qian Liao, Ruixin Zhang, Jiping Chen, Jingye Zhang, Yuqing Lou

Editors: Wei Ye, Demei Niu

Acknowledgement

This project would not have been successful without the support of many people, including: Maeve Fitzpatrick (Deputy Head of International Research Development) and Min Rose (Deputy Director of Knowledge Exchange Asia), Research & Innovation, University Nottingham (UoN); Professor David Salt, Director of Future Food Beacon (FFB) of UoN, Professor Scott McCabe, Vice Dean and Research Director, Nottingham University Business School (NUBS); Professor Kim Tan, NUBS; Professor Simon Mosey, Director of Haydn Green Institute for Innovation and Entrepreneurship (HGI), NUBS; Dr Nicole Yang, Assistant Professor, School of Biosciences, UoN; Dr Yi Wang, Assistant Professor, University of Nottingham Ningbo Campus (UNNC), China; Professor Liyan Zhang, Tianjin University of Finance and Economics, Mr. Yexiang Zhang, Director of Rural Cooperative Economics Administration, Changde Municipal Government; Dr Min Tang, State Councillor, Deputy Chair of YouChange China Social Entrepreneur Foundation (YouChange); Ms. Hui Ling, Secretary-General of YouChange; Mr. Honglin Liu, Secretary-General, Chinese Society of Cooperative Economics; Professor Yuansheng Jiang, Dean, School of Economics, Sichuan Agricultural University (SAU). We are particularly grateful to the following people for their support in the implementation of this project: Dr. Richard Masterman, Former APVC of UoN, Mr. Jason Feehily, Director of Knowledge Exchange Asia of UoN, Mr. Qiang Peng, Director, Office of Province-University Cooperation; Professor Can Liu, Forestry Economics & Development Research Centre, State Forestry Administration of China, Dr Hannah Noke, Deputy Director of HGI; Dr Lorna Treanor, Research Director of HGI; Ms Janine Sey and Mr Elliot Baker, NUBS; Ms. Joanna Green, Research and Innovation, UoN; Xinrong Xia (Director) and Qing Chen (Deputy Director), International Office of Exchange and Cooperation, SAU.
# Table of Contents

**Executive Summary** ....................................................................................................................... 1

1 **Introduction** ................................................................................................................................. 7
   1.1 Global Challenges Research Fund (GCRF) .................................................................................. 7
   1.2 Theoretical Framework of Cooperative Ecosystems .................................................................... 9
   1.3 Project Design ............................................................................................................................. 12
   1.4 Report Structure .......................................................................................................................... 15

2 **Collection of Academic Paper Abstracts** ................................................................................... 18
   2.1 Constructing cooperative ecosystem for rural development in marginal areas of China: a case study of Sichuan ........................................................................................................... 18
   2.2 Government intervention on cooperative development in the poor areas of rural China: a case of XM beekeeping cooperative in Sichuan ................................................................................. 19
   2.3 Government-led ecosystem for land shareholding cooperative development in Chongzhou of Sichuan ........................................................................................................................................ 20
   2.4 NGO-led ecosystem for poverty alleviation in rural China: a case study of women e-commerce training in YouChange Foundation ........................................................................................................ 21
   2.5 Urban participation in cooperative development via e-commerce in rural China: a case of JT cooperative in Sichuan .......................................................................................................................... 22
   2.6 Financial credit and cooperative development in marginal areas of rural China: an ecosystem perspective .................................................................................................................................................. 23
   2.7 Constructing finance collaborative ecosystem for cooperative development in rural China: a comparison of two cases in Sichuan ........................................................................................................... 23
   2.8 Reverse migration and entrepreneurship for rural tourism development in marginal areas of China: an ecosystem perspective ............................................................................................................ 24
   2.9 Innovative model of rural tourism and returned student entrepreneurship in marginal areas of China: an empirical study in Tibetan areas of Sichuan .............................................................................. 25
   2.10 Academia-led ecosystem for community development in ethnic minority areas of China: a case study of H village in Yunnan ............................................................................................................... 26
   2.11 Building a science and technology backyard (STB) ecosystem for poverty alleviation and talent development in minority areas of China: a case of Butuo Potato STB ........................................................................ 29
3 Social Impact Reports ...................................................................................................................31

3.1 Potato industrialisation and Internationalisation in Liangshan Prefecture, Sichuan Province ........................................................................................................................................31

3.2 Aba High-End Honey Industrialisation and Internationalisation ...........................................36

3.3 The Community Development and University Student’s Participation in Rural Tourism in Marginal Areas of Sichuan .........................................................................................................................39

3.4 Social Innovation and Community Development in Environmental Projects in National Natural Reserve Parks of China ......................................................................................................................44

3.5 Organic Agriculture and Social Innovation in the Poor Areas of Southwest China.. 48

4 Student Capability Development Report .................................................................................55

4.1 Student Capability Development Survey Results ..................................................................55

4.2 Selection of Student Reflections .............................................................................................59

5 Conclusion and Policy Recommendations ..............................................................................63

5.1 Research Findings and Social Impact ..................................................................................64

5.2 Policy Recommendations .....................................................................................................69

6 Appendix ..................................................................................................................................71

6.1 UoN-SAU GCRF Team ...........................................................................................................71

6.2 Summary of A Report of Joint Investigation and Collaboration Suggestion on Potato Industrialisation in Butuo ......................................................................................................................................77

6.3 List and links to blogs of the project .......................................................................................... 79
Executive Summary

The theme of this project is ‘cooperative ecosystem to empower small farmers in the poor areas of China: case studies of Sichuan’ (referred as ‘cooperative ecosystem project’ or this project hereafter). It is a pilot project led the University of Nottingham under the Global Challenges Research Fund (GCRF) that is funded by the British government. The overall aim of this project is to understand the composition, evolution, types of cooperative ecosystem and their impact on the initiative and development of cooperatives based on the practice and exploration of cooperative development in Sichuan Province in the last decade. The project also intends to develop a platform facilitating communications and collaborations among stakeholders to explore the pathways of improving cooperative ecosystems and offer suggestions and policy recommendations on how to achieve industrial revitalisation, poverty alleviation, rural sustainable development in the poor areas of Sichuan and beyond. Nonetheless, it contributes to research collaboration and talent development in the areas of rural studies between University of Nottingham and Chinese partners from universities, research institutes and social organisations, and between China and the UK.

This project is led by Dr. Bin Wu, Senior Research Fellow of Haydn Green Institute for Innovation and Entrepreneurship (HGI), Nottingham University Business School (NUBS), with a joint effort from a team from scholars and students from Sichuan Agricultural University (four schools of Agriculture, Management, Economics, Tourism), College of International Development and Global Agriculture of China Agricultural University, YouChange Social Entrepreneur Foundation and University of Nottingham Ningbo Campus (UNNC)

The overall aim of this project can be further divided into three interwoven objectives:

1. **Research Objective**: to develop understanding on challenges facing small farmers and rural communities in the poor areas of Sichuan, different types of cooperative ecosystems and impacts on cooperative development, local pillar industries and livelihood security of rural families. This goal will be addressed by research findings though a compilation of extensive abstracts of eleven academic papers in this report.

2. **Social Impact**: to establish a platform facilitating communications and collaboration for stakeholders to address challenging issues by joint activities, action plan and policy recommendations, which in turn enhance the impact dissemination and capability building of
all stakeholders. The goal of the social impact will be addressed by a collection of five social impact reports.

3. **Capability Development**: to enhance capability development of those students who participated in this project by focusing on four indicators: challenge-oriented thinking, interdisciplinary perspective, communication skills with different stakeholders and academic competences in design and deliver the project. The outcomes will be demonstrated by a survey report and student reflections.

The 11 academic paper abstracts based on research findings can be divided into five groups. The first focuses on theoretical model construction of cooperative ecosystems in the poor areas in China. It reviews the elements, characteristics and impact of different cooperative ecosystems through a scrutiny of the challenges facing the poor areas of Sichuan and a series of empirical studies conducted in the region.

The second group (three papers) studies two types of external interventions led by the government and urban volunteers respectively, set in different geographic and economic environments. Three different cases have been scrutinised respectively – beekeeping cooperative, land shareholding cooperative and fruit cooperative – in order to uncover conditions that lead to successful external intervention, and pathways of sustainable cooperative development.

The third group contains two papers that tackle rural finance and credit, a key element influencing cooperative development in rural China today. Under the umbrella of the national campaign on poverty alleviation, local exploration and innovation practices to cope with the constraints from rural finance and credit are studied from two perspectives: a longitudinal study covering households from 180 cooperatives of 10 sample counties in four provinces, and a comparison of two cases of financial cooperative models.

The fourth group has three papers that investigate the roles of NGOs and universities in building and nurturing new ecosystems to overcome the shortage of rural talents and initiate a process to identify and release internal driving force for community development in the poor and minority areas. They uncover the impact, success and pathways of these three organisations on industrial development and rural sustainability.

The fifth group of two papers is based on field investigations and case studies on returned/reverse migration and entrepreneurship for rural tourism and community
development in their home communities in Tibetan region of Sichuan. They shed new light on pathways, entrepreneurial characteristics, successful conditions for the survival and model dissemination in different ecosystems, which makes contribution to theoretical modelling of rural tourism ecosystem and the roles of social capital in overcoming the bottleneck of talent shortage the marginal and minority areas of Sichuan and beyond.

The social impact chapter consists of five reports. The first focuses on potato production, a main source of food and livelihood security for ethnic minorities in poor and mountainous areas of Sichuan, and Yi Minority Region in particular. For the purpose of poverty alleviation and sustainable development in this region, this report demonstrates the necessity and feasibility to develop a strategy of potato industrialisation and internationalisation, which is largely dependent upon the participation and contribution from multi-disciplinary scholars and multiple stakeholders. Based upon the established Butuo Potato Science and Technology Backyard (STB) for agricultural extension, this report offers a pathway for enhancing social impact by upgrading the STB’s function to include the elements of social innovation and international collaboration for potato industrialisation.

The second report is set in the advantageous beekeeping industry in Aba Prefecture of Sichuan, where a collaborative platform for multiple stakeholders has been successfully built to promote the industrialisation and internationalisation for high quality honey export.

The third report sets foot in the challenge of talent shortage in marginal areas of Sichuan and opportunities to attract return migration and entrepreneurship for rural tourism in this region. Bringing together the challenges and opportunities, it offers insight to the role of universities in participating in and promoting rural tourism through transforming students’ mindsets, better understanding ecosystem approach and establishing tourism community demonstration bases.

The last two reports uncover the contribution of social innovation and international participation in environmental protection in underdeveloped areas in West China, empowerment of the disadvantaged and community development from two perspectives: environmental education and organic agriculture development. They put forward ideas, pathways and suggestions for strategic partnership with the University of Nottingham (UoN) and UK-China collaborations in Southwest China on sustainable agricultural and rural tourism development.
Given the fact that around one hundred students have participated and gained benefits from this project at various extents, a student capability development report is employed in this report, which consists of two parts. The first part reviews the results of the survey completed by students from Sichuan Agricultural University (SAU) and China Agricultural University (CAU) that participated in this project. The survey investigated different ways of participation, students’ understanding of how this project affected their academic thinking and skills, and the ratings of capability development goals and this project in general. The second part includes a selection of student reflections on participating in this project.

In reflection to research objective of this project, a number of conclusions can be drawn from the eleven papers based on field researches and case studies:

1. There is a significant knowledge gap between the principles of cooperative derived from successful experiences of cooperative development in the western world and the practices in the developing world where government intervention plays more important role in cooperative development than what it is expected. To fill this gap, this report offers a ‘cooperative ecosystem’ approach to broaden the cooperative research to account various factors and conditions that affect local cooperative development, and to better understand the pathways and the diversity of cooperative development in the poor areas.

2. Government-led cooperative ecosystem is beneficial to cooperative development in poverty-stricken areas, but it is not the only ecosystem that works. Other effective ecosystems that are led by NGO (YouChange Foundation), universities (CAU, SAU) and urban volunteers have been studied. Adopting a cooperative ecosystem approach helps to understand the Chinese experience in the national campaign against rural poverty alleviation in the past five years, which is led by the government and participated by all sectors in the society while facilitating cooperative development has been listed as an important dimension/goal. This project shed new light on rural studies in these regions.

3. This report covers a range of industries: main crops, honey, fruit, potato, rural tourism, e-commerce, etc.; key issues in cooperative development: land transfer, financial credits, talent development, technology supply and service; ethnic minority groups: Tibetan, Yi and Yao; different social groups: rural women and reverse migrants; different ways of external intervention: government intervention directly, skills training led by NGOs, embedment of universities and participation of urban volunteers. These case studies provide valuable insights in cooperative ecosystem and contribute to cooperative development research.
4. Not limited to the poor areas of rural China, this project demonstrates the value of an ecosystem approach in bringing together multidisciplinary scholars to account for the voices of different stakeholders, and small farmers in particular, and grasp local knowledge and wisdom for innovative solutions to cope with the challenges in other developing countries.

Regarding the social impact from this project, this report draws following conclusions. Firstly, it is confirmed that challenge-oriented research project can attract and engage with multiple stakeholders effectively, which lays a sound foundation for mutual trust, effective communication to identify common interests and develop new ideas and local solutions. Secondly, challenges in poverty-stricken areas call for building a suitable platform for the participation and contribution from multiple disciplines (art, humanities, natural and engineering science, social and management science), and multiple stakeholders (e.g. governmental agencies, non-profit organisations, business entrepreneurs, cooperative leaders and small farmers) to develop innovative, inclusive, feasible and sustainable solutions and roadmaps. Thirdly, a key contribution of this project is that it clearly points out the important role of social innovation in community development and poverty alleviation in the poor areas of rural China as well as the impact of NGOs or social enterprises in tackling those challenges. Fourthly, internationalisation is a key element embedded in all of our social impact cases, which sheds new light on the vision and roadmap for the UK-China collaboration in sustainable agricultural and rural development in Southwest China. Finally, this project establishes a platform for a joint entrepreneurship education and training programme between UoN, CAU, SAU, UNNC, YouChange, Yunhe and others, for Chinese and UK university’ students in the areas of environment protection, community development and rural tourism in marginal areas of China.

In terms of student capability development goals, this project draws the following conclusions: Firstly, it has provided opportunities to take part in academic research and social practice for students from SAU, CAU, through academic discussions, regular seminars on methodology, online and offline field research, as well as joint dissertation supervision. Secondly, the four main goals in student capability development (challenge-orientated, interdisciplinary thinking, cross-sectoral communication, research and innovation skills) are feasible and acceptable by most students involved in this project. Lastly, the platform established by this project involves multiple stakeholders, which has obvious impact on improving student’s capability in interdisciplinary skills. In general, this project shed new light on higher education reform towards enhancing the links between universities and society, and students’ participation and contribution to community development.
Research findings of this project contain following policy implications for Chinese governmental agencies, enterprises and organisations:

1. More attention should be paid to build a platform for multiple stakeholders’ participation and contribution to cooperative development and local pillar industrial development.

2. Local governments should focus on initiating, creating and improving the cooperative ecosystem in the region.

3. Applying cooperative ecosystem approach to reveal and summarise successful cases in poverty alleviation and cooperative development in the past five years to uncover conditions underpinning success and lessons learnt and develop an indicator system and management software of government intervention.

4. Providing favourable policy and financial support to encourage NGOs, universities and research institutes, urban volunteer groups to participate in rural revitalisation and cooperative development.

This project also suggests the following points to promote UK-China collaboration in trade, technology, education, and humanity communication:

1. Create a UK-China hub on rural innovation and entrepreneurship research to promote international research collaboration alone the line of SDGs, BRI and poverty alleviation in the marginal areas of the developing world;

2. Establish several pilot demonstration zones for UK-China cooperation on food safety, organic agriculture and rural tourism in Southwest China, to explore pathways and mechanism for the industrialisation and internationalisation of ecological agriculture, and to facilitate leadership and entrepreneurship training for cooperative development and rural sustainability in the developing world;

3. Emphasise a challenge-oriented, interdisciplinary and stakeholder engaged methodology in research design and application to the Newton Fund or other joint funding schemes in the near future based on successful experience and formatting of the GCRF programme.
1 Introduction

As China’s targeted poverty alleviation campaign is coming to an end in 2020, a salient question to all people (including the academia) would be how to consolidate the outcome of this campaign to achieve industrial revitalisation and sustainable cooperative development in rural areas. To meet the requirements of the Global Challenges Research Fund (GCRF) and take into account the China’s (Sichuan Province in particular) practice in poverty alleviation and cooperative development, this introduction aims to propose a framework called ‘cooperative ecosystem’ for empirical studies in the underdeveloped regions in China, and outlines the design, aims, outcomes and summary of this report.

1.1 Global Challenges Research Fund (GCRF)

To tackle rural poverty in rural areas of the developing world, the United Nations (UN) have launched two agendas for international community: Millennium Development Goals (2000 – 2015) and the Sustainable Development Goals (2016 – 2030). Among the multiple challenges hindering poverty alleviation and sustainable development in the developing world, the most pressing problem is how to empower millions of small farmers and help them better adapt and integrate into external markets. Empowering small farmers is important because they provide livelihoods for poor and low-income families that account for two thirds of the total population (2 billion) in the developing world. Though it is recognised that farmer cooperatives could be one of the most efficient ways to bring together small farmers to enhance skills, product quality and product added value for market competitiveness, the progress is rather slow and limited. In developed countries for instance, 40% of total population have participated in or been benefited from various cooperatives in, while that of the developing world account for less than 10%. Therefore, it is paramount to study the efficient way to bring together small farmers through cooperative development.

As the largest developing country in the world, China has the biggest population of small farmers (230 million), accounting for nearly a half of that population worldwide. Though China has achieved unprecedented progress in industrialisation and urbanisation after 40 years of open-up, the phenomenon of small farmers, which is related to household responsibility system, will continue to exist for a long time. To address this challenge, the Chinese government has put forward a series of regulations and measurements to promote the development of farmer cooperatives by issuing a series favourable policies. By October
registered farmer cooperatives reached 2.2 million in China, and over 130 million of small farmers have access to the service and trainings provided by these cooperatives, accounting for 50.1% of total small farmers in the country. As we acknowledges the achievements of cooperative development in China, existing problems in cooperative development should also be addressed: firstly, too much attention have been paid to the growth in quantity instead of the improvement in the quality of the cooperatives; secondly, some cooperatives lack systematic management and effective measures to regulate the behaviours of cooperative leaders and members; thirdly, some cooperatives serve the few farmers with strong capital and thus undermine the participation of small farmers; last but not least, there is regional disparity as cooperatives clusters around economically developed provinces in coastal areas, whereas most of cooperatives in poor areas are established in recent years and far to be matured or stable.

The impact of cooperative development on poverty alleviation in poor areas is closely related to the Sustainable Development Goals (SDGs). The Chinese government has spent the past five years in implementing targeted poverty alleviation programme in underdeveloped regions in West China, providing valuable insights and experience for the developing world in general. In the government-led poverty alleviation programme, cooperative development is counted as one of the indicators for performance appraisal. With the help of governmental funding and the participation of counterpart organisations outside of this region, farmer cooperatives have established in most of the poor villages with aims to help poor households to participate in specialised production at large scale for external markets. By June 2020, 682,000 cooperatives have been founded in poor regions (832 counties) in China, covering 90% of poor villages and lifting more than 21,978,000 people out of poverty (People Daily, 29 July 2020). As the national campaign on poverty alleviation is concluding in December 2020, it raises a challenging issue for rural development in next phase – how to consolidate the existing achievements in poverty alleviation so as to achieve industrial revitalisation and sustainable cooperative development. The Chinese experience may provide valuable insights for cooperative development and poverty reduction in the developing world.

To address the UN SDGs, the British government established a £1.5 billion funding steam in 2015, the Global Challenges Research Fund (GCRF), as part of UK’s official development assistance (ODA), aiming to support cutting-edge research that addresses issues affecting the developing world. GCRF emphasises interdisciplinary research that aims to tackle challenges of the developing world, establish and develop research partnerships, and enhance research and innovation between the UK and the developing world. The University of Nottingham (UoN) set out clear requirements for its GCRF applications to show:
1. a clear vision, comprehensive plan and measurable project impact indicators;
2. the potential to offer solutions for issues affecting its targeted regions or countries;
3. comprehensive and interdisciplinary research addressing local challenges;
4. its contributions to one or several SDGs; 5) integration of research into the social, political, economic, historical and cultural background of local regions.

To address the vulnerability of small farmers in the developing world, the UoN-GCRF awarded a pilot project - *Cooperative ecosystem to empower small farmers in China: A case study in Sichuan*. This project aims to conduct an interdisciplinary research to understand the impact of cooperative development to help small farmers in terms of better access to technology, connection to external markets and poverty alleviation in underdeveloped regions of China. This project aims to provide new ideas, platform and pathways to address issues related to small farmer empowerment and cooperative development in China and the developing world. It also intends to demonstrate the feasibility and social impact of its research findings by working together with multiple stakeholders to develop joint action plans and project initiatives. This project was originally awarded from August 2019 to July 2020 then extended to December 2020 due to Covid-19 pandemic.

The Principal Investigator of this project is Dr Bin Wu, Senior Research Fellow, Haydn Green Institute for Innovation and Entrepreneurship (HGI), Nottingham University Business School (NUBS). The Co-Investigator is Professor Xinhong Fu, Dean of the School of Management, Sichuan Agricultural University (SAU). Participating institutions and organisations of this project include: Four Schools of SAU (Agriculture, Management, Economics and Tourism), College of International Development and Global Agriculture of China Agricultural University (CIDGA-CAU), YouChange China Social Entrepreneur Foundation (YouChange Foundation), NUBS China, part of University of Nottingham Ningbo China (UNNC).

### 1.2 Theoretical Framework of Cooperative Ecosystems

This project attempts to develop and apply a concept of ‘cooperative ecosystem’ as the theoretical framework for empirical study on the good practices of cooperative development and poverty alleviation in China. The aim is to uncover the diversity of cooperative ecosystems and the impact on cooperative development and farmer’s participation, and then develop suitable platforms for multiple stakeholders working together to tackle local challenges and show the pathways of social impact from this project.
The term ‘ecosystem’ is derived from ecology, referring to a unit of the interconnections and interactions between living organisms and the non-living components. In this unit, biotic and abiotic components interact with one another and remain at a relatively stable status, reaching a dynamic balance. Ecosystem emphasises the interdependence of different components, the exchange of material, energy and information and the evolution as a unit. The idea of ecosystem also provides theoretical basis and framework for Interdisciplinary exchange and cooperation among arts, natural and social sciences. Ecosystem represents a new research paradigm that highlights:

1. systematic view – identify the key elements of the research object at, and interconnections between, macro, meso and micro levels;

2. opening and self-organising – a process of the evolution and development by continuously absorbing negative entropy flow from the outside.

The ecosystem approach provides a sound foundation for studies on cooperative development in the developing world, as it requires an objective, comprehensive and holistic view on cooperative development. It helps to understand the complexity, diversity and openness of cooperative development from both internal and external perspectives and thus contributes to identifying challenges and opportunities for cooperative development. In this report, ‘cooperative development’ refers to the whole process from when a few individual farmers accept the idea of cooperative and voluntarily help each other in production, operation and sales; to an internal and stable mechanism on mutual trust and benefits, fair distribution and democratic decision-making, leading to a unified body of collective will that interacts with external communications emerged; then to the stage when more farmers are attracted to join this organisation, or establish their own organisation in a similar way. This definition stresses the following factors:

1. **dominated by farmers** – cooperative development is based own voluntary alliance and independent decision-making;

2. **a gradual process** in which individual small farmers learn, understand, accept and then consciously use cooperative principles to coordinate internal interests and gradually form collective will and unified actions;

3. **Overall relevance** – cooperative development is based on mutual trusts and benefits among farmers within that community, which can be strengthened and upgraded through economic practices, and gradually form a relatively stable body;

4. **open system** – the idea of cooperative originated from Western capitalist society, which
needs to be adapted to the traditional small farmer thinking in the Chinese context, and thus early-stage cooperative development in China is largely dependent on external stimulus;

5. **Self-organisation and Dissemination** – farmer cooperative that adapts to local environment can attract more farmers to participate in it, or establish similar cooperatives, which in turn forms a self-initiated process of dissemination.

Cooperative development in the rural areas of the developing world depends on an ecosystem that is conducive to its scale-up and dissemination. In the report, ‘cooperative ecosystem’ is defined as the sum of all factors, conditions and relationships associated with the establishment, development, diffusion and upgrading of farmer cooperative. Cooperative ecosystem includes **factors and dimensions** in natural environment, economy, society, politics and culture, involving **multiple levels** (macro, meso and micro) of interaction and influences. The definition of its research scope depends on the agricultural productions and the material, energy and information exchange directly related to farmers’ livelihood in local areas. Furthermore, as the idea of a cooperative and a process of self-organisation and self-innovation, cooperative development is dependent on and subject to the conditions where a cooperative ecosystem is formed. The success and development of a cooperative provide positive thrust to the improvement of that cooperative ecosystem, which in return attracts more external resources and cooperative members and thus leads to structural upgrade and functional optimisation. Successful cooperative model may disseminate and result in an acceleration of local pillar industrial and cooperative development.

Cooperative ecosystem sheds new light on the studies on cooperative development and empowerment of small farmers in the developing world in the following ways:

1. The cooperative development is essentially the output of the interaction among multiple factors to secure livelihood systems of small farmers. In other words, it is a process initiated by the farmers themselves to learn, adapt, utilise and thus change the cooperative ecosystem.
2. Cooperative ecosystem cannot exist independently outside the economic and social development of that regions. In other words, cooperative development is part of, and constrained by rural development and social transition in the developing world.
3. Cooperative ecosystem cannot exist independently outside of the geographical environment. Difference at geographical scale and resource endorsement determine the nature and boundaries of cooperative ecosystems. Therefore, ecosystem boundary can be defined according to different research questions, in order to observe and analyse the
phenomenon of cooperative development in a specific region at a specific geographical level. Even if the larger environment is not favourable, farmer cooperative may still emerge, survive and thrive in a smaller and favourable environment. It is critical for the academia to uncover the underlying factors behind the successful case of cooperative development.

4. In defined temporal and spatial conditions, cooperative ecosystem is composed of many factors, of which one or more are dominating. Dominating factor/factors determine the nature of such an ecosystem and the cooperative development model, pathways and dissemination boundary.

5. Cooperative ecosystem itself is also a dynamic and open system that adapts its systematic structure and functional relationship as the cooperatives within the system is developing. This may lead to the evolution and upgrade of the ecosystem, reach balance at a different level, or provide new thrust for cooperative development, which in turn provide new momentum for rural economic and social development and environmental improvement in the region.

1.3 Project Design

The theme of this project is ‘cooperative ecosystem to empower small farmers in the poor areas of China: case studies of Sichuan’ (referred as ‘cooperative ecosystem research’ hereafter). The overall aim of this project is to understand the composition, evolution, types of cooperative ecosystem and their impact on cooperative development based on local practices in Sichuan Province in the last decade. The project also intends to create a platform facilitating communications and collaborations among stakeholders, to explore the pathways of improving cooperative ecosystems, and offer innovative suggestions and policy recommendations on how to achieve industrial revitalisation, poverty alleviation, rural sustainable development in underdeveloped regions. In this way, this project can contribute to research collaboration and talent development in rural innovation and entrepreneurship for sustainable agricultural and rural development among Higher Education Institutions (HEIs), research institutes and social organisations, and between China and the UK.

Sichuan is selected for case studies for the following reasons. Firstly, located in Southwest China, Sichuan is not only a province with a large population but also with the largest number of small farmers, which is representative of agriculture and rural development in China's underdeveloped areas. Secondly, Sichuan sits next to the Plateau, two thirds of its land area is plateau and mountainous landscape. The complexity and diversity of its geological structure and ecological system offer great value in terms of understanding small farmers in marginal areas of the developing world. Thirdly, there 55 ethnic minorities live in
Sichuan, accounting for 5% of the total ethnic population in China. From the perspective of the interconnection between biodiversity and cultural diversity, Sichuan offers a unique opportunity to conduct a research on interconnection and coordinating development between sustainable agriculture, environmental and cultural protection, and community development in marginal areas of China. In addition, among the 832 counties listed as national recognised counties by central Chinese government in the poverty alleviation campaign in 2014, 66 (7.93%) of them are in Sichuan. In the total 52 poverty-stricken counties on the 2020 governmental poverty alleviation watch list, seven of them are in Sichuan. As a province with clustered population living in poverty, Sichuan is a good case to observe government intervention, targeted poverty alleviation and cooperative development.

Based on the concept of cooperative ecosystem and the goals of this project, three objectives have been set out:

1. **Research Objective**: to develop understanding on challenges facing small farmers and rural communities in the poor areas of Sichuan, different types of cooperative ecosystems and impacts on cooperative development, local pillar industries and livelihood security of rural families. The GCRF research team consists of over 40 members from the University of Nottingham (Nottingham University Business School, School of Biosciences), University of Nottingham Ningbo China, Sichuan Agricultural University (School of Agriculture, School of Management, School of Economics and School of Tourism), China Agricultural University (College of International Development and Global Agriculture), YouChange China Social Entrepreneur Foundation (YouChange), NUBS China, part of University of Nottingham Ningbo China (UNNC). The GCRF research team is divided into the following five research groups comprised by researchers and students from SAU:
   - Cooperative policies and government engagement (led by Xinhong Fu)
   - Pathway of cooperative leaders (led by Shemei Zhang)
   - Rural finance and cooperative development (led by Zhao Ding)
   - Rural tourism development in ethnic minority areas (led by Baojiang Geng)
   - Potato industrialisation and internationalisation in Sichuan (led by Xiyao Wang)

   Research findings of this project is demonstrated through academic paper abstracts in various topics:
• Constructing cooperative ecosystem for rural development in marginal areas of China: a case study of Sichuan.

• Government intervention on cooperative development in the poor areas of rural China: a case of XM beekeeping cooperative in Sichuan.

• Government-led ecosystem for land shareholding cooperative development in Chongzhou of Sichuan.

• NPO-led ecosystem for poverty alleviation in rural China: a case study of women e-commerce training in YouChange Foundation.

• Urban participation in cooperative development via e-commerce in rural China: a case of JT cooperative in Sichuan.

• Financial credit and cooperative development in marginal areas of rural China: an ecosystem perspective.

• Constructing finance collaborative ecosystem for cooperative development in rural China: a comparison of two cases in Sichuan.

• Reverse migration and entrepreneurship for rural tourism development in marginal areas of China: an ecosystem perspective.

• Innovative model of rural tourism and returned student entrepreneurship in marginal areas of China: an empirical study in Tibetan areas of Sichuan.

• Academia-led ecosystem for community development in ethnic minority areas of China: a case study of H village in Yunnan.

• Building a science and technology backyard (STB) ecosystem for poverty alleviation and talent development in minority areas of China: a case of Butuo Potato STB.

2. **Social Impact**: The social impact goal of this project is to develop a platform facilitating communications and collaboration for stakeholders, with a common purpose to address challenging issues, form action plans and policy recommendations, apply for joint funding or projects, which in turn enhance the impact dissemination and capability building of all stakeholders. In particular, this project aims to achieve impact in the following areas:

• Potato internationalisation and industrialization pilot in Liangshan, Sichuan.

• Honey internationalisation and industrialisation pilot in Aba, Sichuan.

• Community development and student engagement in rural tourism in
underdeveloped areas in Sichuan.

- Social innovation and community sustainable development in natural reserves in West China.
- Ecological agriculture and social ecology development in poor areas in China.

3. **Capability Development**: It aims to enhance capability development for postgraduate student community who participated in this project, most of which were Masters and PhD students, with a few undergraduate students. The capability development goals can be divided into four categories: question-oriented academic thinking, interdisciplinary research, communication skills with different stakeholders and academic writing aimed at various audiences. These goals have been achieved through the following channels and methods:
  - Three academic lectures and seminars on research methodology from an ecosystem perspective that focused respectively on ecosystem concept and its application, project design and field research methodology, aiming to exchange experience, reflections and discussion;
  - Joint design, discussion and implementation of field research projects, including online and offline surveys/interviews/field visits carried out by the research groups;
  - Academic paper proposal, discussion and writing – this project also engaged with and mentored postgraduate students from CIDGA of CAU in thesis design and field research;
  - Project blog writing and student industry/social practice projects, providing suggestions on project planning for staff and student exchange programme funded by the International Scholarship Council at SAU.

1.4 **Report Structure**

This report is divided into five chapters: executive summary and preface; collection of academic paper abstracts based on research findings (eleven abstracts); social impact report (from five cases); student capability report; conclusion and policy recommendation.

The eleven academic paper abstracts in the Research finding chapter can be further categorised into five groups. The first group of papers focuses on the construction of the cooperative ecosystem theoretical model in underdeveloped areas in China. They review the
history of rural cooperative development and argue the necessity to bring in the concept of 'cooperative ecosystem', the innovative aspect of this concept and the feasibility of such concept through empirical studies. They also summarise the components, characteristics, success parameters and development stages of different kinds of cooperative ecosystem according to the challenges affecting cooperative development in underdeveloped areas and empirical research findings of this project. Then they demonstrate the application of the ecosystem approach in project design, field research, dimensions of data analysis, index setting, procedures of research hypothesis, in order to clarify the theoretical significance of the research findings.

The second group comprises of three papers that study two kinds of external interventions led by the government and urban volunteers, set in different geographic and economic environments. Three different case studies have been scrutinised respectively – honeybee cooperative, land shareholding cooperative and fruit cooperative – in order to uncover conditions that lead to successful external intervention and sustainable development pathways for different kinds of cooperative, and thus reduce bias in government intervention on cooperative development. The third group includes two papers that focus on rural finance and credit, a key element regulating rural cooperative. The two papers uncover changes in different kinds of rural financial cooperative ecosystems and their impact on cooperative development by researches in the practices of local stakeholders and the development of policies in rural finance credit over five years from two perspectives: a longitudinal study covering households from 180 cooperatives across ten counties in four provinces, and a cross sectional study that compares two financial cooperative models. The fourth group has three papers that investigate the roles of Non-Governmental Organisations (NGOs), Higher Education Institutions (HEIs) and research institutes in building and nurturing new ecosystems, from the angle of talent shortage and internal driving forces in underdeveloped areas. These papers respectively study how three types of organisations mentioned above create special value, successful conditions and dissemination pathways for local industrial revitalisation and rural sustainable development, and how these organisations contribute to rural talent development by engaging current university students, returned student entrepreneurs in rural areas and rural women. This group of papers provides insights in realistic challenges in rural areas, such as how to improve educational and social ecosystems in rural revitalisation and cooperative development, and explore the strengths of HEIs in innovation and model dissemination in rural community development. The fifth group of two papers is based on field investigations and case studies on rural tourism and entrepreneurs who returned to their hometown in Tibetan areas in Sichuan. They put forward model pathway, entrepreneurial characteristics, successful cases and model dissemination
for rural tourism development in different ecosystems, from the perspective of constructing theoretical model of rural tourism ecosystem and the way that social capital overcomes the bottleneck of talent shortage.

The chapter on social impact is divided into five parts focusing on different perspectives. It begins with the pathway for this project to enhance potato internationalisation and industrialisation and talent development in Liangshan Yi Minority Autonomous Prefecture in Sichuan. It explains the strategic importance of potato industrialisation in the ration and livelihood security in underdeveloped areas in Sichuan, the impact of this project on the functional optimisation of the Potato Science and Technology Backyard, and summarises the strategies, main activities and achievements of this project in building a multi-disciplinary, multi-levelled network and platform for social innovation and international collaboration. The second part focuses on how the GCRF research team contribute to the industrialisation and internationalisation of high quality honey in Sichuan (particularly in Aba Prefecture) through building a collaborative platform for multiple stakeholders, the establishment of Gonglai Honey Science and Technology Backyard and interdisciplinary research activities. The third part starts from the challenge affecting community development - talent shortage in rural tourism, reviews how students who participate in this project transform their mindsets, deepen the understanding of ecosystem and field research methodology, and summarises the outcomes of demonstration bases showcasing collaboration between HEI and local community. The fourth and fifth parts reveal the contribution of social innovation and international participation in ecological and environmental protection in underdeveloped areas in West China, empowerment of the disadvantaged and rural sustainable development from two perspectives: environmental education and organic agriculture development. These two parts put forward ideas, pathways and suggestions for strategic partnership development with the University of Nottingham and UK-China collaborations in Southwest China on rural tourism and ecological agriculture.

Student capability report consists of two parts. The first part reviews the results of the survey completed by students from SAU and CAU that participated in this project. The survey investigated different ways of participation, students’ understanding of how this project affected their capability development, and the ratings of capability development goal and the project in general. The second part includes a selection of student reflections on participating in this project.

(Dr Bin Wu, PI of UoN-SAU GCRF Project)
2 Collection of Academic Paper Abstracts

2.1 Constructing cooperative ecosystem for rural development in marginal areas of China: a case study of Sichuan

In the context of the vulnerability and empowerment of 500 million of small farmers in the world, it is recognised that cooperatives can play an important role in helping them to solve numerous challenges they face and contribute to food security (ILO/ICA, 2014). In reality, however, the value-based and principle driven cooperative movement often conflicts with cooperative development practices due to the heavy involvement of government. Viewing cooperative development as a part of rural development and poverty alleviation in the developing world, this paper proposes a conceptual framework, cooperative ecosystem, with aims to:

1. understand the rationale of government intervention on cooperative development in the developing world,
2. reveal the role of government intervention in initiating and facilitating cooperative development in the poor areas;
3. develop a system for observing and distinguishing governmental intervention in constructing cooperative ecosystem.

Above aims are addressed through a historic review of the changes of government role in cooperative ecosystem since the mid-20th century, and the new momentum of cooperative development since the issue of the Law of Farmer Professional Cooperatives in 2007.

Taking into account the variation of the role the government in cooperative ecosystem and rural development across the county, in particular, this paper provides a case study on cooperative ecosystem and government intervention in Sichuan, a province representing the poor areas and front-line of government-led poverty alleviation in China.

This paper contributes to cooperative studies in the developing world in following aspects:

1. an approach of cooperative development as a means of rural development in the developing world;
2. an analysis framework on the role of government intervention on cooperative development for poverty alleviation;
3. a criteria system for sustainable cooperative development and poverty alleviation to
evaluate the outcomes (success or failure) of government intervention.

(Bin Wu and others)

2.2 Government intervention on cooperative development in the poor areas of rural China: a case of XM beekeeping cooperative in Sichuan

A puzzle facing the scholars for cooperative studies in the developing world is the role of government intervention which may vary greatly depending upon many factors or conditions. This paper applies an ecosystem perspective to analyse and evaluate government intervention on cooperative development in the poor areas of rural China where top-down governmental intervention is strong as a part of the poverty alleviation programme in the past five years. Nonetheless, the results of the governmental intervention in cooperative development in this region are mixed, both successful and failed. By a case study of the XM Beekeeping Cooperative in a high mountainous and Tibetan Minority dominated county of Sichuan, this paper attempts to analyse and evaluate the government's intervention on cooperative development in the poor areas of China from an ecosystem perspective, and to reveal the conditions for the successful establishment and sustainable development of cooperatives in the region. In particular, it aims to answer the following questions:

1. Why is it necessary for the government intervention on the cooperative development in the poor areas of rural China?
2. Under what conditions can government intervention succeed, leading to a process of scaling-up and spread of the successfully model of the cooperative?

The research findings from this paper contribute to the debates in government intervention and cooperative development in the developing world from two aspects:

1. a framework for observing and evaluating the government intervention on cooperative development in the poor areas;
2. conditions and indicators of the successful or failed government intervention.

(Shimei Zhang, Rui Chen, Bin Wu, Jingzhi Liang)
2.3 Government-led ecosystem for land shareholding cooperative development in Chongzhou of Sichuan

The rapid urbanisation and large scale of rural-urban migration is often accompanied by rural decline and "agricultural marginalisation" in China. To cope with this challenge, there is an increasing call for land transfer for private farm or cooperative development. This paper draws attention to the emergence of land shareholding reform nationwide in recent years from an ecosystem perspective to reveal the conditions for the successful and sustainable cooperative development through land shareholding system. Specifically, by analysing the successful case of Chongzhou Land Shareholding Cooperative, this paper attempts to address the following questions:

1. Why does the development of land shareholding cooperative development require government intervention?
2. What are the forms, characteristics, strengths and boundaries of government intervention in the different stages of the cooperative development?
3. How a favourable ecosystem is created and developed for the successful, sustainable development and spread of land shareholding cooperatives?

The main research findings and contributions of this paper include:

1. a new conceptual framework, "land shareholding cooperative ecosystem", to understand the challenges, barriers, dynamics and opportunities of rural land transfer, scaling-up, participation and empowerment of small farmers in rural China;
2. new light on the motivation and key factors of multiple stakeholders which engaged the process of land transfer and shareholding cooperative initiative, development and diffusion widely;
3. in-depth understanding of the conditions of successful government intervention and the variation of its role in the different stages of land shareholding cooperative development;
4. a reference for constructing an ecosystem for land shareholding cooperative development in different geographic and economic conditions in Sichuan province and beyond.

(SAU Cooperative Policies and Government Engagement Research Group)
2.4 NGO-led ecosystem for poverty alleviation in rural China: a case study of women e-commerce training in YouChange Foundation

Having involved rural development in China for three decades, non-government organisations (NGOs) have been increasingly important in the national campaign for poverty alleviation due to their advantages in terms of operation principles, mobilisation and integration of various resources, access to and recognition of targeted groups. In particular, Chinese government brought a concept "Mobilising all Sectors of Society to Participate in Poverty Alleviation and Development" in 2014, which encouraged NGOs, along with other public and non-public entities to play active roles in this campaign. This has provided significant room for NPOs to participate in and make contribution to, so called "social or grand poverty alleviation", during the national campaign.

The framework of “grand poverty alleviation” specifies that the diversity of poverty alleviation entities is one of the main features of the national campaign. A challenge emerged during the period regarding the coordination between participatory entities due to different understanding on the causes of rural poverty and the needs of the rural poor, leading to the "fragmentation" of poverty alleviation intervention in practice. Furthermore, it raises an outstanding question about the intrinsic dynamics within rural communities and the sustainability of rural development after the end of the national campaign.

From an ecosystem perspective, this study takes the women's e-commerce training project of Youchange Social Entrepreneur Foundation as an example to reveal the role of NGOs (Youchange) in building a poverty alleviation ecosystem at the macro, meso and micro levels respectively, as well as the interrelation and co-evolution mechanism among multi-level entities. In particular, this paper aims to address following questions:

1. How do NGOs take grand poverty alleviation as an opportunity to build an ecosystem with the participation of different entities?
2. What roles do different stakeholders play in e-commerce training and empowerment?
3. What are the key conditions for efficient mobilisation, empowerment and scale-up of women's participation and entrepreneurship?

The main theoretical contributions of this study are:

1. A conceptual framework of NGO-led ecosystem for poverty alleviation to account for the roles and contribution of NGOs in poverty alleviation in rural China;
2. An insight in the coordination of multiple stakeholders by the NGOs under the backdrop of “grand poverty alleviation”;

3. Insight to the endogenous driving force and developmental potential of women groups for bottom-up development and rural sustainability through e-commerce training and entrepreneurship.

(YouChange Foundation and Bin Wu)

2.5 Urban participation in cooperative development via e-commerce in rural China: a case of JT cooperative in Sichuan

In the context of rural decline and revitalisation in China in the 21st Century, we have witnessed the increasing participation and contribution from urban citizens and groups to rural development and empowerment via various channels. With a focus on the application of digital technology for food safety and distribution, this paper sheds new light on the value and pathway of urban participation for the initiative of farmer’s cooperative development there. By a case study on JT fruit cooperative in the suburban zone of Chengdu Municipal of Sichuan Province, in particular, this paper offers insights in:

1. understanding the positive role of government appointed village officer, a civil servant as the head of village, in rural development;

2. the motivation of and shared interests with urban customers representatives’ engagement in food safety project;

3. channel and mechanism for mutual trust and cooperative initiative.

Interconnecting with international debates on sustainable development and cooperative development in the developing world, this paper makes theoretic contribution in following aspects:

1. rural revitalisation via urban participation in empowering small farmers for their sustainable livelihoods against the backdrop of unbalance urbanisation;

2. the pathway of cooperative development via a combination of government intervention and civic participation from urban volunteers;

3. conditions of urban participation and opportunities of e-commerce emergence.

(Shemei Zhang, Jingmei Mo, Bin Wu)
2.6 Financial credit and cooperative development in marginal areas of rural China: an ecosystem perspective

In the context of cooperative development for poverty alleviation and rural sustainability in the emerging economies, this paper draws attention to challenges, constraints and exploratory practices in financial credit in agricultural supply chain, a most challenging issue facing cooperative development in the marginal areas of rural China. Based upon a longitudinal survey in 180 cooperatives covering over 6000 household members from 18 counties of four provinces from 2015 to 2020, this paper aims to address following questions:

1. What progresses and trends can be recognised for cooperative development in this region to cope/catch challenges and opportunities in financial credit in agricultural supply chains during the period of national campaign of “targeted poverty alleviation”?
2. How can a typology be developed to differentiate innovative practices among sample cooperatives?
3. What are the variations in terms of features and conditions between different types of financial credits for cooperative development against geographic location, resource enforcement, products and market access, economic and social development, policy environment and government intervention, as well as minorities and cultural factors?

This paper contributes to the debates about financial credit and cooperative development in the developing world in following aspects. Firstly, it offers a conceptual framework for financial credit ecosystem (FCE) for cooperative development to provide a holistic view and methodological accounting for multiple factors and dimensions which influence or determine the financial credit for cooperative development internally and externally on the one hand, and distinguishing innovative practices of financial credit in agricultural supply chain into different types for comparison and clarification on the other. Secondly, it illustrates different types of FCE, and roadmaps to cope with challenges and opportunities for sustainable cooperative development in different regions and stages of cooperative development. Thirdly, it provides insights to key factors and roles of key stakeholders to improve the FCE for sustainable cooperative development in marginal areas of rural China. Policy implications are discussed.

(Yun Shen, Bin Wu, et al.)
2.7 Constructing finance collaborative ecosystem for cooperative development in rural China: a comparison of two cases in Sichuan

For cooperative development in rural China, the most challenging issue is the constraint in the access to financial capital. This paper draws attention to explorative practices at grassroots level to remove such barrier. By comparing two typical cases in cooperative finance in Sichuan Plain and Mountainous areas respectively, this paper aims to answer three questions:

1. what are the conditions for the formation and development of cooperative finance in regions with different economic status?
2. What are the motivations for farmers to join the cooperative financial ecosystem? Is there any external pressure?
3. What factors affect the operating mechanism of cooperative finance? Is social capital a major factor?

The main research findings and contributions of this article include:

1. new understanding on behaviour motives, cooperation mechanisms and paths of financial ecological entities under different external environments;
2. the influences of social capital on the cooperation of farmers in production, capital, and marketing;
3. the demonstration and diffusion of new model in rural cooperative financial innovation.

(Zhao Ding, Daochuan Yang, Yujing Lou, Jingye Zhang)

2.8 Reverse migration and entrepreneurship for rural tourism development in marginal areas of China: an ecosystem perspective

In the context of rural revitalisation in emerging economies, this paper draws attention to a new phenomenon of reverse migration and entrepreneurship to cope with the challenges and opportunities in marginal areas of China. With a focus on the rural tourism sector, the
paper aims to understand the conditions underpinning successful, sustainable rural development and proposes a conceptual model of the rural tourism ecosystem (RTE). The context is its mountainous and minority ethnic region. Multiple cases are taken from Ganzi, a Tibetan Minority Region of Sichuan to address following questions:

1. What are the motivations and factors behind reverse migration and entrepreneurship in this region?
2. What are the roles of key stakeholders in the successful project initiative?
3. How could a favourable ecosystem be built-up and developed for sustainable development and innovation diffusion of those projects?

This paper contributes to the debates about sustainable rural development and tourism in the developing world in following aspects. Firstly, it provides a rural tourism ecosystem framework for a holistic view and methodological process to account for the multiple factors and dimensions which influence or determine the success or failure of rural tourism project in the marginal areas of emerging economies like China. Secondly, it sheds new light on a new trend of reverse migration, which is driving rural revitalisation in China and explains the key factors behind successful initiatives of rural tourism entrepreneurship in the marginal areas of China. Thirdly, it offers insight to key conditions for sustainable rural tourism projects in minority regions of China; Fourthly, it illustrates different types of rural tourism ecosystems for successful initiative, scaling-up and innovation diffusion in minority regions of Sichuan.

(Bin Wu, Baojiang Geng, Lu Liao, Yi Wang, Scott McCabe, Liping Zeng, and Biyi Deng)

2.9 Innovative model of rural tourism and returned student entrepreneurship in marginal areas of China: an empirical study in Tibetan areas of Sichuan

This paper focuses on the challenge of talent shortage in the poor areas of China where there is an increasing demand for rural tourism development. Based upon the collection and analysis of five successful cases of university graduates who returned to their home towns and became entrepreneurs in Ganzi, a Tibetan Prefecture of Sichuan, this paper aims to answer following questions:

1. How did they develop ideas of returned migration and entrepreneurship for rural tourism?
2. What are the key factors, links, and opportunities behind the initiative and maintenance
of their businesses?
3. What are conditions for different types of business models underpinning the successful establishment, sustainability and diffusion widely at local, regional and higher levels.

The empirical study of this paper consists of five cases, involving homestays, the integration of agricultural brigades, the growth of Tibetan entrepreneurs (including women), community development, social entrepreneurs and international participation. Case collections include online and offline interviews, as well as community field observation studies. The interviewees were mainly Tibetan entrepreneurs, including village cadres, villagers and government officials.

This paper can contribute to the debates about rural tourism in marginal areas of the developing world:

1. the different types of rural tourism models against the variations of resources (e.g. geographical and ecological resources, infrastructure development, socio-cultural environment), external intervention for poverty alleviation;
2. the key factors affecting rural tourism and sustainable development in marginal areas of China, especially the role of social capital in successful return entrepreneurship;
3. the key conditions of successful rural tourism entrepreneurship in the ethnic minorities areas of Sichuan and other provinces in China.

(Baojiang Geng, Lu Liao, Bin Wu, Liping Zeng, Biyi Deng)

2.10 Academia-led ecosystem for community development in ethnic minority areas of China: a case study of H village in Yunnan

Poverty elimination as the first goal of the UN sustainable development goals (SDGs) calls for external participation or intervention to initiate a process to identify and release the intrinsic dynamics and potential within communities. In the context of “grand poverty alleviation” in China from since 2015, public entities including universities have been encouraged to send teams to poor villages to accelerate local economic development and poverty alleviation.
Two challenging issues arise here: how can external intervention or support be accepted and integrated into local communities to initiate a process of community development to catch extra opportunities and benefits that help reduce poverty and sustain the result in those poor areas? What is the role of universities in this process: as a provider of supplementary education or as an additional force to solve community development problems?

This paper attempts to tackle above dilemmas by a case study of H Village with Yao ethics in Mengla county of Xishuangbanla Prefecture of China, which was an extremely poor village five years ago. Five years later, the village has experienced significant improvements in its income level, industrial structure, infrastructure construction, water and electricity, housing construction, sanitary conditions, landscaping, and income structure of farmers; and in 2019, a professional farmer cooperative was established to operate its new economic activities with the conference and tourism industry as the mainstay; new characteristics appeared in the way and ability of villagers to deal with outsiders, and the income levels among individual villagers gradually showed differences compared to those five years ago. In the process of these changes, there are various sources of external support, one of which is from a research team (abbreviated as L research team) introduced by Professor L from an agricultural university in Beijing with a history of more than 100 years.

The research questions this article tries to answer are: How did the various actors involved in the development of the H village community create an ecosystem for developing innovative industries, which promoted poverty reduction and development in the village? What is the L research team’s role, and how is it different from other external supporters?

This study is mainly based on primary data collected from 2016 to 2019 by the authors and students from the L research team. Individual interviews focusing on household livelihood change and their opinion on external intervention have been conducted for all 57 households in the village. Documentation, observations and daily chat were going through the whole procedure. Several international or national workshops and conferences is held every year, and documentations and observations have been done as well.
The results show that:

1. Academia-facilitation of ‘interventionist approach’ accelerated local people engagement and, furthermore, enhanced the capacity of poor people for lifting themselves out of poverty.

2. Due to the constraints in power structures and control of livelihood capitals, local people were unlikely to find their preferred opportunities at the first stage of external researchers’ entry into the village. However, along with trust building, knowledge sharing and industrial adjustment initiated by outsiders with high commitment, an academia-led ecosystem, including resources, rules and organisational patterns, was formatted for innovative industries implementation which led to a ‘great leap forward’ in income structure of community. Then poor people’s livelihood capitals accumulated significantly, which guided them to find novel chances.

3. Facilitated by the research team, community people went through a process of observation, involved participation, positive participation, and self-organisation. External support broke previous stability in the village and then the village slowly achieved a higher level of economic and social stability. The same process applied to village governance, in which villagers’ cooperative was set-up, at the right time.

4. The innovative industrial ecosystem and organisational pattern could be applied to nearby or similar rural communities, which shed new light on the participation of HEI and research institutes in rural community development and poverty reduction.

   The implication for external support to community development is:
1. the design of external support needs to consider both maximum profits and adaptation process of innovation which is also the process of ecosystem construction for novel industries;

2. integration of external and internal agencies is more important than emphasizing the role of one-side agency;

3. academia with specific commitment and multiple identities can provide solid base and agencies to create an ecosystem for community development.

(Gubo Qi, Haiyan Song, Bin Wu, Xiaoyun Li*)

2.11 Building a science and technology backyard (STB) ecosystem for poverty alleviation and talent development in minority areas of China: a case of Butuo Potato STB

The empowerment of small farmers in marginal areas of the developing world is difficult to achieve without a platform for multiple stakeholders' participation and contribution to the development of farmers' understanding, skills and confidence for better adaptation and access to external markets. This paper draws attention to a new phenomenon, the establishment and diffusion of “Science and Technology Backyard” (STB), a station for agricultural technology demonstration and dissemination created by Chinese agricultural universities aiming at poverty alleviation and local development in the poor areas of China.

From an ecosystem perspective, this paper offers a case study of Butuo Potato STB in the Yi Minority area of Sichuan to address the following questions: What role can a STB play as an innovative platform for multiple participation and contribution to poverty alleviation? What is the contribution of the STB to not only the empowerment of small farmers via technology training and dissemination, but also the development of university students’ understanding and skills? What are implications for agricultural universities in talent development and community engagement toward sustainable development and poverty alleviation in the marginal areas of China and beyond?

This study adopts the method of case study to collect data mainly by participating in observation and daily record. Investigation report and work log are important data sources.
Timely information was also obtained through semi-structured interviews with Butuo County, township and village cadres and farmers.

The research findings are as follows:

1. STB continuously provides a platform for multi-parties (government, enterprises, farmers, cooperatives, researchers, etc.) working together effectively for poverty reduction in ethnic minority areas. Among them, researchers, especially resident graduate students, play an important leading and coordinating role in mobilising human resources and communicating with the government, enterprises and other institutions.

2. External support is needed to bridge the gap between resource conditions & local knowledge in poor areas and development needs. These gaps exist in infrastructure, technology, capital, human resources, information, access to markets, and so on. The current poverty reduction strategy is closely related to the measures taken in each of these areas, and the STB is able to make a difference.

3. STB has contributed to local talent development, including the education of farmers, but sustainability issues still need to be addressed after the withdrawal of external human resources support.

4. STB is also an innovative way to cultivate high-quality talents, which has played a role in the capacity building, scientific research and teaching mode reform of participating graduate students.

5. STB should not be limited to teachers and students in the agricultural science and technology discipline, but need the participation and contribution from social science, especially management science so as to solve the complex problems faced in the promotion, application and marketisation of new technologies.

(Potato Industrialisation Research Team, Gubo Qi, Bin Wu)
3 Social Impact Reports

The goal of the project's social impact is to facilitate communications and collaboration between different stakeholders to address challenging issues, and develop action plan, policy recommendations.

3.1 Potato industrialisation and Internationalisation in Liangshan Prefecture, Sichuan Province

Project background

Sichuan is one of the main concentrated areas of the rural poor in China, of which the poverty-stricken mountainous areas (mostly ethnic minority areas) account for 68.3% of the total area of Sichuan. Sichuan is the main producers of potatoes in China. Potato is the main grain crop, the food rations, the security and the main source of livelihood for poor farmers in the minority areas of Sichuan Province, especially the Liangshan Yi Autonomous Prefecture (referred as Liangshan hereafter). Liangshan has the potential to develop a high-quality seed potato supply base for the national and international markets due to its advantages in geography, climate, soil and water resources. However, there are many challenges, such as mixed local varieties, low seed potato vigour, and backward cultivation and processing technology. They have restricted the effective extension of potato industry chain and their advantage in poverty alleviation and income increase. Therefore, the Liangshan government is devoted in developing seed potato industry as the pillar industry to drive local economic development and poverty alleviation.

In order to improve the technological level of the potato industry in Liangshan, accelerate the transformation and application of scientific and technological achievements, and give full play to the advantages of the local potato industry, the Potato Research and Innovation Team of Sichuan Agricultural University (SAU) established a "Butuo Potato Science and Technology Backyard (STB)" in February 2019, the first STB in the impoverished areas in West China. It aims at poverty alleviation through the application of new technology, the development of local characteristic industries, and the increase in product output and farmers' income. It is supported by Bujiang Shufeng Ecological Agriculture Technology Co., Ltd. in Butuo County. It also receives strong support from China Agricultural Technology Association, Sichuan Provincial Association for Science and Technology, China Agricultural University and Butuo County Government.
Butuo Potato STB is hosted by SAU Potato Research Team, with the residence of postgraduate students and standby academic staff. It provide services in discovering and solving a series of technical problems in local potato production timely, from quality selection, seeding, plant protection to harvesting, storage and processing. Through the demonstration of potato breeding bases and supporting professional potato cooperatives, it helps local potato farmers to improve the degree of organisation and standardised production, their ability to cope with climate, pests and diseases and market risks. Not limited to Butuo County, this STB serves as a model for new technology sources and standardised production organisation models for the development of potato industrialisation in other regions of Liangshan.

The establishment of Butuo Potato STB not only provides an important scientific and experimental base for the interdisciplinary academic research in the poverty-stricken minority areas of Sichuan, but also services as an important platform for design, observation, implementation and recording of the social impact of the GCRF project. For the latter, the internationalisation of potato industrialisation in Liangshan was listed as a priority area for provincial-university cooperation in 2020 during the Sichuan-University of Nottingham (UoN) Collaboration Leaders Meeting (November 13, 2019). It provides a solid organisational foundation and political guarantee for the further development and expansion of the social impact of this project.

**Project objectives**

In response to the challenges facing potato industrialisation in the mountainous areas of Sichuan and opportunities from the national campaign for poverty alleviation and the Sichuan-UoN collaboration, the social impact of the GCRF project contains following objectives:

1. **Functional upgrading of Butuo Potato STB**: through the participation of humanities and social sciences, it addresses the bottlenecks of local potato industrialisation, such as poor participation by local farmers, brain drain and talent shortage, efficient use of development-aid cadres from the outside. In addition, it promotes technological innovation and potato industrialisation by incubating social innovation;

2. **Potato seeding industry internationalisation**: Docking and coordinating the UoN, this project creates a platform for a British potato company and its Sichuan counterparts to work together to explore the opportunities and feasibilities in overseas markets for seed potatoes of Liangshan and even Sichuan products. Hopefully it can further develop and
extend the local potato industry chain and inject new momentum into the potato industrialisation and cooperative development for local farmers;

3. **Initiating a social innovation process**: using the Butuo Potato STB as a platform, the project drew on the latest achievements of and the experience of China social innovation and social enterprises contributing to poverty alleviation. With a participation from a top domestic NGO and non-governmental organisation and social innovation research institute, it aims to develop a social innovation network to match with potato technological innovation;

4. **Capacity building for postgraduate students and early career researchers**: by organising postgraduate/ early career researchers to participate in field research, case studies, technical services and blog/field investigation report drafting, this project could help them: overcome narrow professional restrictions; understand the importance of problem-oriented, interdisciplinary and systematic thinking; develop long-term cooperation between Sichuan-UoN in the field of rural revitalisation and sustainable development (including the internationalisation of potato industrialisation).

**Project activities**

1. **Potato Industrialisation and Internationalisation Roundtable (14/11/2019)**: Nearly 100 participants attended, including: Ray Smith, Agricultural Counsellor of the British Embassy in China; Dr Richard Masterman, Associate Pro-Vice-Chancellor Research Strategy and Performance of the University of Nottingham (UoN); Tereza Campello, Former Minister of Social Development of the Brazilian Government; representatives from International Potato Centre and British potato research institutes James Hutton Ltd (JHL); national experts in potato study and entrepreneurs from local potato business. They joined the discussion on the vision, goals and paths of cooperation between China and UK in the industrialisation and internationalisation of potato in Sichuan.

2. **A comprehensive investigation of potato industrialisation in Liangshan (05/01/2020-09/01/2020)**: conducted by 15 academia and project team members from UoN and SAU, an investigation report with policy recommendations has been submitted to the provincial government. This has also facilitated the collaborations between University of Nottingham and Sichuan Xima Potato Technology Company, JHL, YouChange Social Entrepreneur Foundation and Butuo County Government.

3. **New technology promotion service**: involved more than 50 academia and students from SAU throughout the year for many times and 17 postgraduate students as residents of the STB, contributing 30 research reports and proposals.
4. Demonstration base construction: The potato team from School of Agriculture at SAU / Bujiang Shufeng Company / Butuo County Agriculture and Rural Bureau and other units jointly established a seed potato cultivation and technology demonstration base. They have carried out 89 intensive trainings and more than 600 on-site technical guidance. Overall, they have trained more than 30 technology demonstration households and more than 100 agricultural technicians.

5. Production and storage system: A four-level potato production system has been established and 1,000 square meters of cold storage has been improved. This led to the reduction of the potato storage loss from 30% to less than 5% and farmers' commercial potatoes loss by over 5% and the yield is thus increased by 10%. An annual production system of original seeds has been established, and an annual production of 4.6 million original seeds have been successfully achieved. It is planned to achieve full coverage of high-quality seed potatoes in Butuo County within three years. Unmanned aerial vehicle plant protection system: more than 20 academics and students from Sichuan Agricultural University participated in the system demonstration. It covered an area of 20,000 acres and avoided a loss of over 6.72 million CNY (about £766,281).

6. New model of postgraduate training: 35 university students in agricultural related fields carried out social practices. They include poverty alleviation research, education support, dual assistance, scientific and technological training, and science popularisation health training.

7. The impact of the STB: In 2020, the Butuo Potato STB was awarded 'Top Ten Agricultural STB of the Year' among the total 64 STBs that have been built across the country. Taking the Butuo Potato STB as a model, Sichuan has built seven more STBs in the region, participated by at least eight universities.

Social impact pathways

The continuity and enhancement of the social impact in the near future can be summarised as a model of "STB + ", referring to a process of upgrading the function of Butuo Potato STB by the participation of multidisciplinary and multiple stakeholders for potato industrialisation, internationalisation and community development in Butuo, Liangshan and other ethnic minority areas of Sichuan. Specifically, the social impact of the project can be observed and measured from following aspects:

1. Upgrading Butuo Potato STB to add elements and functions of multiple disciplinary, stakeholders participation, including relevant schools of SAU, British and Chinese potato seeding research and development companies;
2. International partnership for potato industrialisation and internationalisation with UoN, James Hutton Institute and James Hutton Ltd (the largest potato seed breeding company in the UK), Sichuan Xima Hi-Tech Agricultural Bioengineering Co., Ltd. A roadmap has developed for the research, breeding and export of potato seeds from Liangshan Prefecture to both domestic and international markets.

3. Social innovation network for leadership/entrepreneurship training and community development: A consent has been reached between UoN, YouChange, CIDGA of CAU, SAU and Butuo County Government to develop a joint training programme for grassroots leaders and returned entrepreneurs along the line of potato industrialisation, internationalisation and community development in Butuo at the first instance.

4. Joint training programme for SAU staff and students who are entitled to visit and stay at UoN for one year with theme of rural revitalisation and sustainability. This has been confirmed by both Chinese Scholarship Council for the funding support by UoN to host visiting scholars from 2020 to 2022 under the above theme.

5. The spread of the "STB +" model: leading to the establishment of eight STBs in different production fields (such as honey, kiwi) and geographic locations across Sichuan, including those in mountainous and ethnic minority areas).

(Potato Industrialisation and Internationalisation Research Group, Bin Wu, and Gubo Qi)
3.2 Aba High-End Honey Industrialisation and Internationalisation

Project background

With respect to rural poverty alleviation and sustainable development in Western China including margin areas of Sichuan Province, the biggest challenge is to develop leading industries with local characteristics and comparative advantages while better utilising and protecting local natural and ecological resources. These industries are expected to build market brands and produce scale effects to drive local economic development and the transformation or upgrading of small-farmer production methods so that they can better adapt to and integrate into the external markets, leading to a sustainable agricultural and rural development.

In this regard, the University of Nottingham (UoN) and Sichuan Agricultural University (SAU) Global Challenge Research Fund (GCRF) team selected the industrialisation of Aba Zhongfeng honey as a pathway for the GCRF project social impact due to following consideration:

1. Sichuan is the largest honey production base in China, and also the honey industry has been listed as a local pillar industry for poverty alleviation by 55 counties;

2. The development of the honey industry can seamlessly connect with the local ecological environment protection, the efficient use of biological resources and the local Tibetan tradition of beekeeping;

3. It is beneficial to the biodiversity, returning farmland to forest and grassland, and vegetation restoration in recent years. Many regions (such as Aba Prefecture) can produce high-quality honey with traditional Chinese medicine healthcare functions. However, high-end medicated honey product has not been recognised and accepted by high-end honey consumers, which has led to the situation of high quality but low price.

Based on the above reasons, this project focuses on the industrialisation of Aba Zhongfeng (a subspecies of Oriental high-end bees), a process of the increase in the commercialisation, standardisation and scale-up production. The project built a collaborative platform with the star enterprises of Sichuan Beekeeping Cooperative (Chongxin Bee Industry Cooperative), Xingmu Beekeeping Cooperative in Heishui County and the Aba Prefecture/Heishui Government. Based on the platform, the project can explore breakthroughs in improving honey industrialization in poverty-stricken areas in Sichuan, the pathways and conditions for academics and students at agricultural universities to participate in the promotion of technological innovation and collaborations with beekeeper cooperatives. Hopefully, the
project could contribute to the sustainable development of beekeeping industry and cooperatives in this region.

**Project objectives**

In response to the challenges facing Aba honey industrialisation, good foundation of early collaboration with Chongxin Beekeeping Cooperative and the Aba Animal Husbandry Taxation Bureau, and also the special opportunities for Sichuan-UoN collaboration, the objectives of social impact of this project can be summarised as follows:

1. From the perspective of the ecosystem, identify the challenging issues facing beekeeping cooperatives in underdeveloped areas in Sichuan, especially in Aba Prefecture, and explore pathways and strategies for the industry revitalization and cooperative development;

2. Build a platform for communication and cooperation between researchers and stakeholders to promote the industrialisation and internationalization of high-end honey and cooperative development in the ethnic minority areas;

3. Create opportunities for early career researchers and postgraduate students to develop international view, interdisciplinary and stakeholder engagement skills for their career development, international exchange and high-quality publications.

**Project activities**

To achieve above objectives, the GCRF research team carried out a series of activities, including the establishment of Qionglai Bee Science and Technology Backyard (STB) and a comprehensive investigation of the bee industry in Heishui County, which provides a solid foundation to further develop and expand the social impact of this project.

1. Give a keynote speech to the event of "World Bee Day" (20/05/2020) by professor Zhang Shemei: More than 200 attendees from Sichuan apiculture enterprises, professional cooperatives, apiculture associations, and beekeeper representatives participated in this event; Professor Zhang was interviewed by Sichuan TV during the event.

2. Field investigation on the strategy pf Aba honey industrialisation (14/06/2020-15/06/2020): A team of five people conducted field investigation in Heishui County, resulting in a report associated with policy recommendation to submitted to provincial and prefecture government afterwards.
3. The establishment of Beekeeping STB with approval and support by the China Agricultural Technology Association (01/09/2020): it has been followed by a partnership with Sichuan Science and Technology Museum for the joint promotion of the public awareness, and a joint funding application to Provincial Science and Technology Department Funding (submitted by the STB and UoN).

**Social impact pathways**

Based upon the collaboration platform of Chongxin Beekeeping STB and partnership with UoN, the long impact of this project can be expected and observed through following channels.

1. Participate and play a leading role in Provincial Beekeeping Association and annual "World Bee Day": From the perspective of beekeeping industrial chains, this project provides consulting services and academic support on issues such as direction of future development, selection of business model, innovation of operating mechanism, policy support docking, brand image and public participation for the leaders of beekeeping cooperatives and beekeepers. In response to world's climate change, the project raises the society's awareness of the special contribution of bees to environmental protection and human survival through the promotion of annual "World Bee Day".

2. Explore the pathway of the internationalisation of Aba Honey: Chinese medicinal plants are the main nectar source of Aba honey, resulting in high quality with medicinal value but limited output. For this reason, a high-end, direct-sale business model is to be developed in the UK/EU markets while scientific verification for nutrients and health effects are key. Both request the participation and contribution from the UoN and interested research institutes and agribusiness companies in the UK and Europe.

3. Interconnecting the Beekeeping STB with local government, enterprises and associations to enhance the foundation of the STB and boost apiculture industrial development in order to extend the Aba honey supply chains for sustainable growth and poverty alleviation.

4. Talent training base through the STB for field research, academic salons, and interdisciplinary and stakeholders' engaged communication of early career researchers and postgraduates. It provides a sound foundation for not only the career development of young researchers and students contributing to rural revitalisation/sustainability in Sichuan/China, but also for them contributing to SAU-UoN research collaboration in the future.
3.3 The Community Development and University Student's Participation in Rural Tourism in Marginal Areas of Sichuan

Project background

In the past decades, China’s rapid urbanisation has caused a large scale of migration from rural to urban areas in human history, resulting in the rural decline and shortage of talents. Meanwhile, there is increasing demand for rural tourism due to the continuous soaring of income levels of urban residents, a good opportunity for the return migration and entrepreneurship for rural migrants and university students who have a rural family background. This raises a salient question about how rural communities in marginal areas with the natural resources can initiate and sustain rural tourism industry to seize the opportunity by addressing or removing the barriers related to conservative attitudes, poor community cohesion and a shortage of professionals. These are key factors in successfully
launching rural tourism projects and making them sustainable, as well as addressing the challenges of consolidating poverty alleviation and achieving rural revitalisation.

The practical experience of developing rural tourism in the poor areas shows that successful rural tourism projects cannot be separated from external investment, scenic spot planning and government intervention. However, equally important, if not more, is to tap the inherent potential of the tourism community and stimulate farmers' enthusiasm to participate in the project. While both are indispensable and interdependent, the lacking of effective means to mobilise and coordinate community development is a common challenge facing rural tourism plan and implementation in these regions. In this regard, universities, with their public nature and advantage of gathering all kinds of talents and student volunteers, can and should play an active role.

The sustainable development of rural tourism in marginal areas of Sichuan is an important part of UoN-SAU GCRF project. Carrying out by a GCRF Rural Tourism Team from the School of Tourism at SAU, and Nottingham University Business School (NUBS) in Nottingham and Ningbo Campus, we focused the challenging issue of rural tourism in the poor areas, i.e., how to generate and sustain endogenous dynamics existing in tourism communities, to which furthermore, what role university academia and voluntary students can play in this process. This report attempts to summarise the good practice of this project and its preliminary results over the past year, and to illustrate a pathway to enhance university's participation and social impact of this project.

**Project objectives**

Based on the achievements and collaborative network accumulated in the past research, the overall aim of the social impact is to develop the abilities of university students who attend this project to understand challenging issues facing rural communities in marginal areas; opportunities for rural tourism development and poverty alleviation; comprehensive and creative thinking through their participation in tourism community development planning; methodological training for leadership and field research design and implementation. A platform will thus be established for long-term cooperation, experimental demonstration, and innovation diffusion between SAU and selected tourism communities.. The specific objectives of this project include:

1. Change students' perceptions: based on the challenges and good practices in tourism communities, to understand the purpose and significance of theoretical study, research topics and participation in social practice; stimulate students' enthusiasm to participate in
projects to solve the common problem of disconnection between theory and practice in universities;

2. Develop interdisciplinary and systematic thinking to understand the complexity and diversity of the sustainable development of rural tourism in the poor areas, in particular the necessity and feasibility of the bottom-up development of tourism communities.

3. Develop new ideas and solutions to cope with talent shortage in tourism communities by focusing the motivations, key factors and conditions of successful returned entrepreneurs;

4. Develop partnerships with a number of tourism communities as the bases for joint project design and demonstrations, leadership training and university students’ training to address the bottlenecks and challenging issues facing tourism community development in poor areas.

**Project activities**

To achieve above objectives, the SAU-UoN tourism team has taken following measures to deliver and enhance social impact, including: methodological training; joint design and delivery of field researches; participating and contributing to tourism community development planning; contributing to the construction of demonstration community base; and participating in tourism community skills training programs. A total of more than 600 university students (undergraduates and postgraduates) have participated or been beneficial from above activities which involved more 500 tourism communities. Of which, furthermore, 66 are ethnic minority communities, 28 are national key poverty-alleviation villages which are mainly located in the government recognised poor counties in Ganzi and Aba Prefectures. More than 91,000 rural people have been benefited from this project, of which 65% are poor. Overall, the project has a large number of beneficiaries and university student participants, covers a wide range of geographical locations and has a wide social impact. The specific project activities are as follows:

1. **Methodological training courses (04/2020-07/2020):** A total of more than 100 university students participated in related academic salons and seminars.

2. **Project field research (08/2020-10/2020):** over 10 students attend the online and offline interviews and field visit to collect information related the project research theme focusing on return entrepreneurship for tourism community development in the Tibetan areas of Sichuan. It has resulted in the establishment of cooperation relationship with eight communities, and a total of 15 people including entrepreneurs, community leaders and farmers interviewed.
3. Community development planning and evaluation (12/2019-05/2020): More than 150 university students participated in the third-party evaluation of government poverty alleviation projects in two states and five counties in Ganzi, Sichuan Province and Qiannan, Guizhou Province; more than 80 university students participated in the Investigation and development plan for the entrance community of the Giant Panda National Park, involving 486 communities with 90,700 people.


Social impact pathways

With respect to the future of social impact from this project, following channels can be used for the further action to be taken or as indicators to observe:

1. Development of talents for rural tourism community development training courses: A series of curricula has been developed for training courses to leaders of tourism communities in different types of geographical, resource and cultural zones, and economic and social development levels in Sichuan, as well as templates for development planning for tourism communities. This provides a sound foundation for developing a reserve of intellectual resources for promoting the sustainable development of tourism communities in Sichuan and beyond.

2. Continuity of training courses, demonstration of good practices and resource sharing with multiple stakeholders. Based upon the established partnerships with key stakeholders (e.g. government agencies at various levels, tourism enterprises and communities) and regular training courses, more and more of community leaders and rural tourism entrepreneurs in Sichuan and Tibetan Areas in particular, and students in SAU and beyond will gain the benefits from this project later on. For the latter, for example, a series of joint academic or professional saloons will be held in the School of Tourism of SAU and also Feihong Community of Dujiangyan City will become a community base of SAU voluntary student entrepreneurship training.

3. A social innovation network for sustainable community development in Southwest China will be created by a joint effort with NUBS, YouChange Foundation for Poverty Alleviation, College of International Development and Global Agriculture of China.
Agricultural University, and Ganzi Yunhe Forest School. A consent has been reached between the project team and the Yunhe Forest School to develop a jointly rural tourism entrepreneurship Prix for training university student entrepreneurs who intend to return to their hometowns for their own businesses and to mobilise them to participate international campaign and the World Climate Change Conference (COP26);

4. Sino-British cooperation in rural tourism community development. With a support from Sichuan-UoN partnership and also the British Consulate General in Chongqing, it is expected to develop a joint training programme for rural tourism entrepreneurs and community leaders at different levels, and also exchange of staff and students from SAU to UoN to develop opportunities for mutual learning and share of experience, resources and opportunities between Chinese and the UK tourism communities.

![Tourism community field research in Dujiangyan City](image1)

![Training for professionals in tourism with disabilities in Dujiangyan City](image2)

![Tourism training in Kangding City](image3)

![Tourism planning and design competition in Feihong community](image4)

(Rural Tourism Development Research Group)
3.4 Social Innovation and Community Development in Environmental Projects in National Natural Reserve Parks of China

Project Background

By the end of 2017, China had set up 2,750 nature reserves, covering a total area of 1,471,700 sq km, accounting for 14.86% of the land area. They have played an essential role in protecting biodiversity and natural resources. However, they are also confronted with the contradiction and imbalance between rural communities' economic development in the surrounding areas and ecological and environmental protection. Due to the high proportion of national poverty counties in the protection zone, the farmers mainly rely on traditional agriculture with heavy dependence on natural resources and utilise the natural resources in a simple way. Moreover, the ecological compensation mechanism is not perfect, lacking an effective means for multiple participation, especially public participation.

To solve the above problems, China's social innovation institutions and environmental public welfare organisations are actively exploring the community development of nature reserves. Since 2015, China's natural education has begun to thrive. More than 20 nature education institutions have carried out outdoor learning experience activities in the communities around the nature reserve. The organisations are trying to tackle the development issues facing nature reserves surrounding rural communities through social innovation. Dragon Yunhe forest school, located in the Tibetan cultural area of Sichuan Province, is one of the successful representatives. The participation of tourism communities in nature education projects has explored a social innovation model to solve the problems of multi-party participation, community development, and environmental protection. It has begun to impact the local education system and the management and training system of nature reserves in Western China.

The successful practice is closely related to the training and support provided by YouChange China Social Entrepreneur Foundation (YouChange), one of the most influential non-governmental organisations in China. The founder of Dragon Yunhe forest school—Xuan Liu, was selected to join YouChange's social entrepreneur training and empowerment platform - "Falcon Accelerator Project".

The program has helped define the strategic positioning of the forest school. Moreover, it introduced external resources that social enterprises required in their initial stages, such as publicity, networking, talent sourcing, and Social Enterprise qualification recognition. This
case also lays a solid foundation for further developing future rural tourism entrepreneurs' training with SAU and YouChange Foundation and expanding the social impact of the GCRF Project in the construction of tourism communities in China's nature reserves.

Project objectives and activities

In 1999, the Murdo mountain area was officially established as a provincial natural ecological comprehensive nature reserve in Sichuan Province. Zhonglu Township, Danba County, Ganzi Prefecture was designated within the experimental area of this reserve. It means the local communities in the nature reserve need to abide by the nature reserve's relevant laws and regulations and completely abandon the previous production and lifestyle, which is at the cost of plundering resources and harming the environment. Based on the characteristics of Danba rural tourism resources and the experience of tourism development in the past ten years, the local government found that the former development model of "government + investment company + scenic area management company + community" does not bring sustainable development to the local community. Instead, it has caused a contradiction between the investment company / Scenic Area management company and the local community. Therefore, in 2015, the local government invited Dragon Yunhe team to plan and design the rural tourism development in Zhonglu Township so as to provide a business model of sustainable rural tourism.

After seven months of community survey, Dragon Yunhe team found that community development's bottleneck was mainly about insufficient community capacity, serious brain drain, community lacking awareness of environmental protection, and the local industry structure is relatively homogeneous. Dragon Yunhe team decided to establish a forest school (eco-environmental education and Community Development Centre) given the above problems. Through nature education and experience, local high-quality ecological tourism resources can be transformed into educational tourism products. The villagers in the communities can establish their own professional rural tourism cooperatives. Meanwhile, it ensures the participation and cooperation of various parties forming agreements to promote local communities' sustainable development. The core content of this case includes the following aspects:

1. International participation in ecological education. To improve the local community's environmental awareness, the forest school designed and developed a set of environmental education curriculum system. Through research and study travel, the education system deeply explored the local cultural and natural characteristics with
unique creativity, strong activity experience and good interaction with the local community. By December 2019, forest school courses have attracted more than 700 tourists from 20 countries and regions, such as Britain, France, Canada, and Australia. The time spent in Zhonglu Tibetan village has also increased from two days to seven days. Their average cost has risen from 200 RMB to 5600 RMB (about £22 to £616), which has created considerable income for local villagers. The forest school charges research scholars but is free for local people, which reduces the threshold for local people to participate in environmental education. At the same time, it can guarantee the regular operation of the forest school. Through participation in environmental education, villagers gradually understand the environmental system and ecological protection and realise the harm of logging, quarrying, garbage, wastewater, plastic film, fertiliser, etc. Their cultural confidence has been improved, and they began to protect the environment and culture of their hometown consciously.

2. Ecological architecture with community participation. The construction of the forest school's ecological buildings has become a significant opportunity to attract local people to participate in community development. The forest school and local farmers jointly explore the most suitable ecological building for the local community and try to adapt local skills and employ local artisans instead of inviting cheaper Han workers from outside like other tourism projects. The forest school also invited well-known designers to participate in the forest school's architectural design, it realises the mutual exchange and integration of traditional skills and contemporary design. During the whole construction process, more than 40 excellent designers and 45 local craftsmen were involved. At the same time, the forest school also actively explores the treatment of garbage, sewage and forthputting of new energy. It starts up the local garbage problem research, promotes more land-friendly planting methods, and advocates the convention on tourists and villagers’ environmental-friendly behaviour in Zhonglu Township. The school also excavates the local traditional culture’s ecological knowledge, etc., which provides the villagers with vivid "ecological education courses."

3. Developing ecological industry chain. Danba County is a national critical ecological function County, but also a poverty-stricken area. The local agricultural productions are relatively homogeneous Potatoes, corn, highland barley, and genkwan root are not only rations but also feed livestocks. Economic crops such as vegetables, melons, and fruits are difficult to be cropped due to environmental constraints. After investigating the environment and evaluating the comprehensive conditions such as sunshine, water source, and soil, the forest school suggested an agricultural upgrade plan to improve and enhance the profit of agricultural products in the community. They grew verbena,
lavender, radish, and other crops that could be further processed in the school's experiment field. It would then help the local community turn existing farmland into an agricultural landscape and develop crops that could be viewed and produced for more economic value. In 2019, the forest school helped the local cooperative obtain 1 million RMB (about £110,000) government funds for a poverty alleviation demonstration project. It developed a lavender planting demonstration, which has become a cultural and creative product representing the image of Zhonglu to enter the market.

Social impact pathways

1. **Community development.** Since the establishment of the forest school in 2015, it has provided traditional tourism skills training for nearly 700 villagers from five local villages, including ecotourism, dormitory management, tourist reception, catering skills, garbage disposal, and nature guided Tours, which not only enhanced the competitiveness of the community but also stimulated the vitality of the villagers. Through regular import of domestic and international study tours for the community, the community residents are provided with jobs such as catering services, accommodation services, vehicle services, and community guided Tours, which bring stable and practical economic benefits to the sustainable development of the community. Under the forest School's active promotion, the village where the school is located has established the "Danba Jiarenyi Rural Tourism Professional Cooperative" to develop local agricultural products and rural tourism. Through the farming and tourism cooperatives, the cooperative members and their families signed the "Zhonglu Township Good Neighbour Convention", "Protection and development agreement" and other essential clauses to ensure that the residents do not hunt, do not cut down trees, do not dig rocks and other damage to the environment of the protected area. Local tourist communities' development also attracts more and more college graduates to return home to work and start businesses.

2. **Diffusion of innovation patterns.** Firstly, based on the forest school, the nature education curriculum of the forest school has been integrated into Danba County primary and secondary schools' formal education system and has received a warm response from teachers and students. Such collaboration has laid a solid foundation for cultivating many young people who love their hometown and consciously protect the environment. Secondly, the successful forest school model has been recognised by the management institutions of national nature reserves in many places, and they have invited the cadres and rangers under their jurisdiction to carry out training in community development. In recent years, the School has conducted 12 training sessions for Qilian Mountain National Park, Sanjiangyuan National Park, Geneishan Nature Reserve, and Danba County Cultural And Tourism Bureau, with more than 800 participants.

Thirdly, the Forest School has established collaborations with UoN, YouChange
Foundation, SAU, and other institutions with research and training network. The network aims to develop pilot and demonstration projects centred on the sustainable development of rural tourism in southwest China, the growth of entrepreneurs, and college students' return to start their businesses.

Finally, the Forest School has developed close cooperation with education and environmental protection agencies and organisations in the UK and other European countries. It is ready to mobilise all sectors of society to participate in green ecotourism, ecological protection, and community sustainable development projects under the theme of the World Climate Conference (COP26) to make China's voice heard.

International participation in environmental education

Community capacity development

Light intervention on lavender cultivation

(Xiaomei Liu, Bin Wu)

3.5 Organic Agriculture and Social Innovation in the Poor Areas of Southwest China

Project background

With respect to the rapid development of urbanisation and rise of residents' income in China, the demand for safe and organic food is significantly increasing. Therefore, more and more urban capital and enterprises are encouraged to contract land in rural areas to develop organic agriculture. However, many enterprises or investors have failed miserably in this process. One of the most important reasons is the lack of long-termism and the concept as well as the dimension of the ecosystem, which means the unity of development of enterprise, poverty alleviation of small farmers, and development of local communities is not reached. Therefore, 'organic agriculture' lacks a matching social environment.

To address the problem that restricts the development of organic agriculture in China, this article aims to reveal the necessity of the interdependence and synchronisation of natural ecosystem, commercial ecosystem, and social ecosystem through the analysis of the successful cases of G.F. Tea in Yunnan Province. Also, it highlights the role of non-profit
organisation (NPO) in helping enterprises integrate more effectively into local society and promoting the sustainable development of the communities.

Founded in 2000 in Shunde, Guangdong Province, G.F. Tea Co., Ltd. is mainly engaged in the trade of tea within European and American markets. Owing to its strict quality control, it has become a Chinese supplier of the top British tea brand Twining. On July 1, 2000, the pesticide residue limit was implemented for tea entering the EU market, which made it very difficult for China to export tea to the EU. Therefore, the founder of G.F. Tea - the Huan sisters were determined to find a different tea planting method at its origin and let the brand of “Chinese tea” shine again. At this time, Ping Wang, founder of YouChange Foundation, was on a field research for social enterprises. By chance, the two founders met with each other. Chairwoman Wang explained the concept and practice of social enterprise to the G.F founder. This immediately ignited the dream in the heart of G.F founder, which was to build ecological tea garden and create a good social ecology as a social enterprise.

After 15 years of development, G.F. Tea has not only established the largest contiguous organic tea plantation in remote and poor areas, but also has become a local leading enterprise, its brand “Tea in Trees” of organic tea is also being recognised by the market. The new venture has lifted the local small farmers out of poverty and contributed to the regional economy directly.

**Project objectives: long-termism and ecosystem concept**

The quality of organic tea is highly relied on natural environmental conditions, especially soil, water, air quality and other factors, while the picking and processing of tea depends on the attitudes, techniques and skills of workers. Organic tea entrepreneurs need great patience and empathy to work with local farmers. The founders of G.F. Tea set the vision of the company as: not seeking to be one of the top 500 companies, but seeking to last for 500 years. This vision reflects the company’s strong long-term values: integrity, authenticity and excellency, both for tea-making and personal conduct.

The natural ecological environment is the core of the organic tea garden. Through the establishment of a biological diversity system to control tea plant diseases and pests, and avoiding the use of chemical pesticides and fertilisers to the greatest extent, are the principle to G.T.Tea during site selection. Accordingly, protection strategies of soil, water source, vegetation, animal and rules for tea production are determined.
An ecological tea garden relies on a sustainable business operation model. G.F. Tea abandons any development model that strives for quick success and instant benefits, but takes the time to foster users, consumers and partners.

Another key aspect of this project is the establishment of social ecology. Owing to the conceptual advocacy and professional support of the YouChange Foundation, the founders of G.F. Tea were attracted by the concept of social enterprise from the very beginning. They were committed to build an enterprise that is conducive to the common development of rural communities, employees and stakeholders. In the early days of the establishment of the Tea Garden (2007), G.F. Tea invited YouChange Social Entrepreneur Foundation to visit Mangbai Village and formed the first “Village Advancement” strategic plan on how to balance between enterprise and societal development. The Plan specified the mission ‘to protect the natural ecological environment and effectively develop resources at the same time, and strive for progress in harmony.’ It also emphasized the importance of promoting the wellbeing of tea farmers and tea workers together with producing high quality tea products, such principles are still the guide of the enterprise even today.

**Project activities: establishment of natural, economic and social ecosystem**

In 2006, the scientific site selection took into account both natural and social conditions. Based on the requirement of tea quality and flavour, G.F. Tea conducted field visits and comprehensive regional research in main tea production areas across the country. Finally, MangBaiVillage, Cangyuan Wa Minority Autonomous County in Yunnan Province was selected, located in the "biological eugenics belt" of the Tropic of Cancer.

2007-2008, on the premise of ecological protection, G.F.Tea opened up wasteland to grow tea. The ecological tea farm uses a total of 15,000 acres of wasteland distributed between 1500 and 1820 meters above sea level. With the support from the government, mobilisation and organisation of Wa Minority villagers, the lands were reclaimed. Not only has 160,000 native alder trees preserved, but also stalk grasses have been preserved to prevent soil erosion.

2009-2014, construction of the tea garden with the participation from international community. G.F. Tea is driven by the international market and it follows the international standards to build an ecological tea garden. In 2011, G.F. Tea Mangbai Organic Garden was certified in China, Japan, the United States and the European Union respectively. In 2012 it became the first Chinese enterprise to obtain the international sustainable agriculture Rainforest Alliance ’certification’ In addition, in 2011, G.F. Tea and its international
customers jointly built a community centre – Mangbai Tea Farmers’ Home, which included a clinic, a technical training room, a library, a sports centre, a standard basketball court, etc. The community centre has since provided conditions for villagers' community participation, project training and the cultivation of the concept of sustainable development. Besides, it has also changed local villagers’ concepts and behaviours:

1. villagers' hygiene habits were improved;
2. children from poor families were encouraged and subsidised to study in ‘agricultural schools’, so that they could acquire skills and seize the chance to reinvent their life;
3. it enriched the villager’s spare-time by organising tea farmers' games regularly;
4. Tea farmers’ awareness of environment protection has been greatly enhanced, which leads them to take the initiative to protect the environment in the tea garden.

2015-2016, the brand of ‘Tea in Trees’ was established. Organic tea with a ‘fragrant character’ began to enter the market, which turned out to be very popular among young white-collar workers and consumers with high quality lifestyle. It also earned more recognition from institutional clients, who are with a sense of responsible consumption and advocating the sustainable development of the United Nations.

2017 -2020, the value overflow and social impact of ecological tea garden. While the brand effect of the organic tea market has made progress, G.F. Tea garden has also gradually become a unique ecological landscape in Cangyuan County. It provides a foundation for the development of environmental education and rural tourism industry. With the support of local government, G.F. Tea is planning to turn the organic tea garden into a destination for natural education. It will combine modern agriculture with natural education, tea culture, local folk culture and other elements into a comprehensive modern ecological agricultural tea garden.

It is a process of simultaneous construction and mutual matching between the natural ecosystem, the commercial ecosystem, and the social ecosystem It is based on organic ecological tea gardens, with export and high-end markets as the target. The main results are as follows:

The key factor to the construction of natural biosphere is to form three-dimensional vegetation and biodiversity community. In this way, when tea trees are harmed by different pests, they can attract enough natural enemies to eliminate pests through the production of different plant pheromones without any pesticide’s intervention.
The construction of the business ecosystem is based on the concept of sustainable development of "not seeking to be one of the top 500 companies but seeking to last for 500 years". It plans the corporate development strategy on the time scale of "a sword in ten years". It establishes a variety of cooperation models with impoverished villages to create its own brand, cultivate markets and consumer groups, exert ecological spill over benefits, and create long-tail commercial value.

The social ecology of G.F. Tea is unique to its context. By means of land transfer with farmers in Mangbai Village, G.F. Tea integrates 11280 acres of barren hills and slopes into its garden. It develops a management mode of "company ownership with household contracting". Local farmers would be able to obtain three sources of income: land rent, tea garden management fees and fresh tea sales. In 2016, Mangbai Village was approved as "National Demonstration Site of One Village, One Product" primarily due to the contribution of G.F. Tea Garden. By the end of 2015, the per capita disposable net income of tea farmers in Mangwei Village was 9,072 RMB (the highest income was up to 11,044 RMB), which was
1,173 RMB higher than that of the county level. Besides, villagers love their own villages and tea gardens, while enterprises and communities form a harmonious ecological relationship: G.F. Tea has established a sustainable tea planting, production, processing, and sales industry chain by circulating barren hills and changing land use methods. This makes the villagers naturally integrated into the modern tea industry chain.

Social impact pathways
The G.F. Tea case is a microcosm of entrepreneurs and investors in China in recent years. It is committed to exploring the coordinated development of ecological agriculture, farmers’ poverty alleviation and prosperity, and rural sustainable development. The G.F.tea is one of the successful cases of practicing corporate social responsibility and the United Nations sustainable development goals (SDGs). In terms of Chinese companies participating in the development of organic agriculture within poor areas to form a benign natural and social ecology, the guide from NPO (YouChange Foundation) and the support from international companies are critical.

From the perspective of rural revitalisation how enterprises can generate their own benefits in the process of improving social environment in the post-poverty period, we believe that the G.F.Tea model can expand its social impacts in the following aspects.

From the business side, G.F.Tea need to continue to explore and improve the innovation in its business model, enhance the brand’s influence to be the top China’s organic tea brand, so as to promote a quality life and the concept of responsible consumption among the consumers;

From the government side, relevant national or local government departments and research institutions have joined forces to organise special surveys and policy discussions on the ecological agriculture behind the G.F.Tea model and the construction of the social ecosystem for sustainable rural development. It can help create a system, policy and talent
environment conducive to responsible enterprise growth and investment in ecological agriculture;

From the perspective of social organisations, G.F.Tea’s case should be actively promoted to the practical experience of the United Nations SDGs, and become a benchmark for Chinese companies to participate in the construction of SDGs, so that more countries and regions can not only participate in the realisation of SDGs, and can benefit in the process;

From the academic perspective, the "G.F.Tea case" can be introduced in the national agricultural university system, entrepreneurs/university students return home innovation and entrepreneurship education training courses. So, it can attract more agricultural entrepreneurs and investors to join forces with social organisations to contribute to the cultivation of new talents for rural revitalisation. Systematic summarization and refinement of the “Biliyuan case” can be included in the corporate social responsibility (CSR) and responsible management education (PRME) courses and training materials related to the United Nations Sustainable Development Goals in the global business school/management school system;

Incorporate the "G.F.Tea Case" into the Sino-British Ecological Agriculture Cooperation Pilot Demonstration Project; encourage more British agricultural enterprises, trading companies, and scientific research institutions to participate in the programme; expand the export of characteristic, high-quality, organic agricultural products from underdeveloped areas in western China and establish local brands; and explore the significance of the "G.F.Tea Model" for national assistance and sustainable rural development in the Belt and Road Initiative.

(Research Department of YouChange China Social Entrepreneur Foundation, Bin Wu)
4 Student Capability Development Report

4.1 Student Capability Development Survey Results

An important goal of this project is to help undergraduate and postgraduate students who participated in this project identify and understand challenges affecting local regions, build on interdisciplinary mindsets and develop their capability in research and innovation. 59 students from Sichuan Agricultural University (SAU) and China Agricultural University (CAU) participated in the online survey, of which SAU accounted for 80% (47 students) and CAU 20% (12 students). The majority of students answered the questionnaire are master students (52.5%), followed by PhD candidates (30.5%) and undergraduate students (16.9%).

An outstanding feature of this project is interdisciplinary participation, involving subjects such as agronomy, breeding, botany, agriculture, rural finance, management, finance, sociology, rural tourism, international trade across five schools (agriculture, economics, management, tourism, arts and humanities). Students from the School of Management accounted for 50.8%, followed by 20.3% from School of Arts and Humanities, 11.9% from the School of Agriculture, 8.5% each from the School of Economics and School of Tourism.

55.9% of the students participated as members of the five research groups under this project, and 15.3% of the students (mainly from CAU) participated in thesis mentoring jointly organised by UoN and CAU. 28.8% of students participated in the GCRF academic seminars that were held three times, covering the following topics: ecosystem methodology, research design methodology and field research methodology. Most of the students joined at least two of the following four activities – research group meeting, academic seminars, field research (online and offline), and papers/blogs writing. Students who took part in research group meeting and academic seminars accounted for 71.2% each, followed by 61% in field research and 47.5% in papers/blogs writing.

The questionnaire investigates student’s motivation in joining this project from the following factors: broaden academic horizons, learn about interdisciplinary research methodology, develop field research skills, prepare academic/degree thesis, build on international project experience, establish network and cooperation. Most students chose more than three factors. As is illustrated in Figure 4-1, 84.5% of the interviewees were motivated to participate in this project as it can help ‘broaden academic horizons’, followed by 61% to ‘learn about interdisciplinary research methodology’ and other factors.
The survey also investigates the areas where students have gained or experienced significant improvement. As is shown in Table 4-1, interviewees were asked to rate ten specific goals related to the project on a scale from 1 to 5 (lowest to highest). Survey results show that interviewees gave positive feedbacks on all of the ten goals, with an average score of 3.6. 80% of the interviewees agreed the project significantly improved their skills in ‘question-oriented research and communications’, ranked first with an average score of 4.15. Goals ranked from second to fourth are: ‘Design field research with an open mind’, ‘Ask research questions related to challenges affecting local regions’, ‘Ask research questions related to challenges affecting local regions’, and ‘Importance of local and grassroot innovation’ – over 70% of interviewees agreed on the positive impact of this project on capability development in the above mentioned aspects.

Despite that the impact on ‘cooperative development and the empowerment of small farmers’ and ‘academic/blog writing’ only ranked at 9th and 10th, they were rated over 3.6 (on average) out of 5. In summary, the survey indicates that this project has made achievements in building student capability.
**Table 4-1 Please rate the impact of this project on your skills on a scale of 1 to 5 (lowest to highest)?**

<table>
<thead>
<tr>
<th>Capability Development Goals</th>
<th>Average Score</th>
<th>Percentage</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge-oriented thinking</td>
<td>3.90</td>
<td>71.2%</td>
<td>3</td>
</tr>
<tr>
<td>Cooperative development for empowering small farmers</td>
<td>3.63</td>
<td>54.2%</td>
<td>9</td>
</tr>
<tr>
<td>Importance of ecosystem approach</td>
<td>3.81</td>
<td>66.1%</td>
<td>6</td>
</tr>
<tr>
<td>Build a collaboration platform for stakeholders</td>
<td>3.69</td>
<td>59.3%</td>
<td>7</td>
</tr>
<tr>
<td>Open mind in conducting field research</td>
<td>3.95</td>
<td>74.6%</td>
<td>2</td>
</tr>
<tr>
<td>Importance of local knowledge and grassroot innovation</td>
<td>3.95</td>
<td>69.5%</td>
<td>4</td>
</tr>
<tr>
<td>Question-oriented research and communication skills</td>
<td>4.15</td>
<td>79.7%</td>
<td>1</td>
</tr>
<tr>
<td>Representativeness &amp; procedure in sampling process</td>
<td>3.85</td>
<td>66.1%</td>
<td>5</td>
</tr>
<tr>
<td>Boundary and initial conditions of typical cases</td>
<td>3.65</td>
<td>59.3%</td>
<td>8</td>
</tr>
<tr>
<td>Academic &amp; blog writing skills</td>
<td>3.58</td>
<td>55.9%</td>
<td>10</td>
</tr>
</tbody>
</table>

In order to identify the discrepancy in capability development that may be affected by different ways of participation, we ask the interviewees to determine if a specific way of participation helps develop their skills (divided into four categories): Understand local challenges, Ecosystem approach, Interdisciplinary communication, Research & innovation skills. As is shown in Table 4-2, participating in research group meeting has balanced impact on capability improvement across all four categories, with a slightly stronger influence on ‘Understand local challenges’. Over 50% of all interviewees agreed that participating academic seminars had an outstanding impact on improving ‘Interdisciplinary communication’ skills. For interviewees who took part in field research, they had improved skills ‘Interdisciplinary communication’ the most, as well as skills in the other three categories. Improvements in ‘Research & innovation skills’ was significantly higher than those in other categories for students who participated in writing academic paper or blogs.

**Table 4-2 Which of the following ways of participation significantly helped enhancing your capability development? (%)**

<table>
<thead>
<tr>
<th></th>
<th>Challenge-oriented thinking</th>
<th>Ecosystem approach</th>
<th>Interdisciplinary communication</th>
<th>Research &amp; innovation skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group meeting</td>
<td>32.2</td>
<td>20.3</td>
<td>27.1</td>
<td>20.3</td>
</tr>
<tr>
<td>Academic seminars</td>
<td>13.6</td>
<td>16.9</td>
<td>50.8</td>
<td>18.6</td>
</tr>
<tr>
<td>Field research</td>
<td>16.9</td>
<td>25.4</td>
<td>33.9</td>
<td>23.7</td>
</tr>
<tr>
<td>Academic writing</td>
<td>25.4</td>
<td>10.2</td>
<td>20.3</td>
<td>44.1</td>
</tr>
</tbody>
</table>

Interviewees were asked to review capability development under four categories mentioned earlier as well as the overall project, using the following rating: Hard to say, Pass, Good and Excellent. According to Table 4-3, over 90% of the students rated their capability to
‘Understand challenges affecting local regions’ as Good or Excellent, which also ranked as the greatest improvement, followed by that in ‘Interdisciplinary communication’. Only 3.4% of students were unclear about their capability improvement after joining this project, and over 71.2% rated this project as ‘Excellent’ and 25.4% ‘Good’. This shows that the outcomes in student capability development have exceeded expectations.

Table 4-3 From the perspective of student capability development, how would you rate this project in general? (%)

<table>
<thead>
<tr>
<th>Way of participation</th>
<th>Hard to say</th>
<th>Pass</th>
<th>Good</th>
<th>Excellent</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge-oriented thinking</td>
<td>--</td>
<td>5.1</td>
<td>30.5</td>
<td>66.4</td>
<td>1</td>
</tr>
<tr>
<td>Ecosystem methodology</td>
<td>3.4</td>
<td>6.8</td>
<td>33.9</td>
<td>55.9</td>
<td>4</td>
</tr>
<tr>
<td>Interdisciplinary communication</td>
<td>--</td>
<td>3.4</td>
<td>30.5</td>
<td>66.1</td>
<td>2</td>
</tr>
<tr>
<td>Research &amp; innovation skills</td>
<td>--</td>
<td>5.1</td>
<td>37.3</td>
<td>57.6</td>
<td>3</td>
</tr>
<tr>
<td><strong>Overall project score</strong></td>
<td><strong>3.4</strong></td>
<td>--</td>
<td><strong>25.4</strong></td>
<td><strong>71.2</strong></td>
<td>--</td>
</tr>
</tbody>
</table>

Against the backdrop that UoN will continue building on its partnership with SAU after this project, the survey listed four suggestions (shown in Table 4-4) on future collaboration for student’s opinions. Results showed these suggestions had positive responses and full support from the students, which in return demonstrates that these proposals can be implemented by the establishment of student volunteer networks that cover different schools and universities.

Table 4-4 Your comments on following suggestions to expand the social impact? (%)

<table>
<thead>
<tr>
<th>Suggestions</th>
<th>Hard to say</th>
<th>Agree</th>
<th>Support</th>
<th>Strongly support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular seminars on ecosystem approach</td>
<td>5.1</td>
<td>25.4</td>
<td>47.5</td>
<td>22.0</td>
</tr>
<tr>
<td>Regular seminars for students to share experience across universities</td>
<td>3.4</td>
<td>23.7</td>
<td>40.7</td>
<td>32.2</td>
</tr>
<tr>
<td>Establish student volunteer network for future collaboration with UoN</td>
<td>1.7</td>
<td>22.0</td>
<td>44.1</td>
<td>32.2</td>
</tr>
<tr>
<td>Tell Chinese stories that address UN SDGs</td>
<td>6.8</td>
<td>27.1</td>
<td>30.5</td>
<td>35.6</td>
</tr>
</tbody>
</table>
4.2 Selection of Student Reflections

Develop problem-oriented research methodology

As a new graduate student, the process of carrying out a literature review, designing a questionnaire for rural households and interviewing the head of a cooperative is full of challenges. The biggest problem is the lack of understanding of the countryside. Through the GCRF project, by participating in either the Liangshan Butuo survey or the Pengzhou survey on the impact of family factor endowments on farmers’ participation in cooperatives, we found that the establishment of cooperatives requires opportunities, platforms, and farmers’ participation. Farmers joining a cooperative need social capital, human resources, and physical capital. For areas where no cooperatives have been established, the village collective economic organisation explores the development of village committees + returning of start-up farmers + cooperatives or enterprises. The development of new cooperatives is changing from small scale, weak operation, scattered investment to organisation integration, business integration, and industrial integration development path. The key to developing industries in impoverished areas or underdeveloped areas is to promote the establishment and development of cooperatives through industrial development.

(Daochuan Yang, First Year Master Student, Rural Cooperative Finance Research Group)

Apply the ecosystem approach to tackle real challenges

I have developed my skills in the following aspects. Firstly, I have established understanding on the ecosystem approach, which helps identify the boundary and initial conditions of different ecosystems so that we can understand the interrelations and interactions of the various factors within the ecosystem from a bigger picture. Secondly, I have trained my problem-oriented thinking. I understand that cooperative development is one of the many ways to achieve poverty alleviation and rural sustainable development. The key to rural sustainable development lies in the development of leading industry that is suitable for and characterised by the region. Thirdly, I pay attention to the social impact of a research. The research team I joined aims to promote the internationalisation of Heishui honey in order to truly address poverty alleviation in the region. I have broadened my view on research as its outcomes can be transferred into tangible projects.

(Rui Chen, PhD student, Pathway of Cooperative Leaders Research Group)
Reflection on Conducting Field Research in Butuo

Three goals have been set out for the field research in Butuo. Firstly, learn from local cadres and do pre-departure background research so as to carry out effective data collection and interviews. Secondly, understand the to lay foundation for subsequent action plans in the future. Thirdly, I planned. However, I was suggested to build. This was a new concept to me and it was useful to understand the needs of the farmers and the cooperative, which also helped future work at the Honey STB. This project provided opportunity to learn from researchers from different schools (Economics and Management), and deepened my knowledge in the ‘STB model – which in general helped promote the model and participation of STB.

(Chi Xu, Master student, Potato Industrialisation and Internationalisation Research Group)

Identify solutions addressing local challenges from field research

During the GCRF field research, we found that the most common way to store potatoes in Liangshan was piling them up, which increased rotting. Moreover, the farmers usually live in the same room as the potatoes, which is harmful to human health. We found that one family use self-made baskets to store potatoes, which enabled neat storage and reduced sprouting and rotting. We then conducted studies in this storage method to tackle the challenge of potato storage in the local region. I learned from this field research that we should not limit ourselves to focus solely on potato breeding. Instead we should also develop communication and marketing skills to become a comprehensive professional in agriculture.

(Jiaxin Zhu, Master student, Potato Industrialisation and Internationalisation Research Group)

Learn to identify local challenges

I met a farmer in my field research who shared his challenge in breeding and selling potato. Potatoes was sold at 0.7 RMB (£0.08)/kg in July but it dropped to 0.4 RMB (£0.04) in August, which suggested selling early could make bigger profits. However, no farmers were willing to do so, because potatoes harvested in July were not mature enough, lacking flavour, and they would rot in just a few months. In contrast, potatoes harvested in August tasted better, having longer storage period. This challenge can be rephrased as follows from an academic perspective: on the one hand, early harvest interrupts potato tuber expansion which results in reduced production; on the other hand, early harvest leads to insufficient accumulation of starch content in potatoes, which in return influences flavour and texture. To address this challenge, we need to bring together small farmers through the cooperative to
carry out planned and large-scale production, and to formulate universal standards to ensure quality.

I also learned knowledge in social science that was different to agriculture. It bridged the gap in theoretical thinking for me, as social science explored the patterns underpinning the success or failure of a specific case.

(Qian Liao, Potato Industrialisation and Internationalisation Research Group)

How to do a good field research

Since participating in the GCRF project, I have been involved in field surveys, conference discussions, report writing, etc. I realised that in the early stage of the survey, it is necessary to make preparations for the selection of research sites that are highly relevant to the research topics. It is also necessary to select innovative and unique research objects for safe and effective research sites.

Taking these factors into account, we finally determined the provincial agricultural demonstration county-Hanyuan County with the development of the "Internet + Cooperative" e-commerce model to carry out the survey; in the middle of the survey, we must focus on the internal and external environment of the cooperative, not limited to government goals; and expand the research content around the characteristics and problems of the growth stage of the cooperative, and completed the investigation of Butuo County through equal interviews and dialogues; in the later stage of the collation and summary, blog writing, online/offline academic seminar. The subject research conference gave me a better understanding of the research topic. In the course of these studies and research, I have gained and improved in the following aspects: treating problems dialectically, raising scientific research questions from realistic and challenging problems, and processing ability to screen and extract scientific evidence information from field survey data. On the basis of refining the ability to summarise the development experience and development model of the cooperative, the ability to write project reports, blogs, summary and other materials.

(Lei Luo, Master Student, Cooperative Policies and Government Engagement Research Group)
Develop research career through social practice

I used to think that scientific research was carried out in labs, and only natural science can be called scientific research. Through participating in this project, I have realised that researchers who made achievements will spend a lot of time in field research, especially for studies in arts and humanities. Research methods usually are combined by surveys, interviews and field visits, which cannot be done in a lab. It requires a large amount of data collection, sampling and interviews; then to design a clear interview structure to communicate with interviewees. Thanks to this project, I have unlocked my potential and determined my intention to carry out further postgraduation studies, hoping to develop a research career.

(Biyi Deng, Undergraduate Student, Rural Tourism and Cooperative Development Research Group)

How to design a thesis focusing on real challenges

I previously tried to find my research topic by identifying gaps in literatures and thereby develop new theoretical frameworks. However, this may result in research questions that were not relevant to reality. Through communicating with the project PI, I have developed a bigger picture of rural revitalisation – to achieve balanced development in urban and rural areas. Two questions emerged from this thinking: How do urban citizens participate in rural development? How does capital reach rural areas? Then I have identified the key topic of my research – rural revitalisation through talent development. Thanks to this project, I was able to connect my research to the real challenges in the society.

Regarding the thesis, my initial idea was to quickly identify research objects for the next step of research and interview. Through the supervision and communications facilitated by this project, I discovered that I focused on the social capital in the start-up stage of returned entrepreneurs, which helped narrowed my research questions. I found it was efficient to have a clear thesis proposal that help ask the right questions.

(Lu Liao, Master Student, Rural Tourism and Cooperative Development Research Group)
Reflection on field research on rural tourism

My initial thought of thesis writing was to identify research questions from the gap in existing literature review. By taking part in this project, I learned how to develop critical logic, and identify research questions that I was really interested in. In this way, I was able to discover the value of my research questions and motivated to conduct further researches, offering solutions to the real challenges in the region.

By attending several seminars of this project, I learned that I can start from a real challenge and develop a problem-oriented research topic. My concern in conducting interview was how to identify interviewees and how to motivate them to participate in the interview. These were answered during the seminars: Firstly, find a topic that you and your interviewees were both interested in to build trust. In this way, you were able to meet the objectives of the interview and may obtain unexpected outcomes. Secondly, during the interview, you must explain your intentions in a measured manner and then raise questions around the subject, following the interviewee’s ideas. When it went off-topic, pull the ideas back and investigate thoroughly the background and experience of the interviewee.

(Xinyi Lin, Master Student, Rural Tourism and Cooperative Development Research Group)

5 Conclusion and Policy Recommendations

As a UoN-GCRF pilot project, the overall aim of this project is: to understand the composition and impact of cooperative ecosystem based on the explorations and practices of cooperative development in the poor areas of China; to build a stakeholders platform to facilitate ideas, pathways and policy recommendations to improve cooperative ecosystems for industrial revitalisation and rural sustainability; to strengthen research and talent training cooperation between UoN and HEIs, research institutes and organisations in China.

Previous chapters have summarised the outcomes of this project based upon the collection of extensive abstracts, social impact reports, student survey report and reflection respectively. This conclusion chapter is to summarise research findings, pathways of social impact and policy recommendations.
5.1 Research Findings and Social Impact

A number of conclusions can be drawn from research findings from eleven academic paper based on field researches and case studies:

1. There is a significant knowledge gap between the principles of cooperative derived from successful experiences of cooperative development in the developed world and practices cooperative development in underdeveloped areas in the developing world where government intervention plays an important role. This report suggests fill in this gap by adopting a wider perspective – take into account factors and conditions that affect local industrial revitalisation, cooperative development and the participation of small farmers in the wider context of poverty alleviation and rural sustainable development – to objectively scrutinise the impact of external intervention (including government intervention). Thus, this report reaches such conclusion that cooperative development in the poor areas should be treated as a mean of rural development, focusing on the inseparable link between cooperative development and dominant/advantageous industries (or products) in the region. This could help to understand the necessity and successful conditions of government intervention, and explore the driving mechanism and pathway for sustainable development through the combination of top-down and bottom-up perspectives.

2. In light of the complexity and diversity of geographic, ecological, economic, social and cultural contexts in poor areas, it is necessary to introduce a concept of “cooperative ecosystem” into the domain of cooperative research in order to fully consider various factors, conditions and constraints, and to reveal different pathways and driving mechanisms of cooperative development. Applying cooperative ecosystem approach, all of eleven papers illustrate elements, structure and process to construct different cooperative ecosystems for the purpose of field research design and data analysis in different fields of agricultural production and rural economic development. Hopefully, it provides a methodological reference for cooperative research to account for the complexity of cooperative development in the developing world.

3. The theoretical value of the cooperative ecosystem approach is to provide methodological foundation for the comprehensive, objective and in-depth scrutiny of the successful experience and lessons learned from the cooperative development in the poor areas. The ecosystem approach can be applied to uncover the underlying factors/conditions of a successful model of cooperative – the boundary and initial
conditions for its development and dissemination. The findings of this report help understand the construction and characteristics of the ecosystems that are conducive to cooperative development, clarify the role and status of different stakeholders during the construction and maintenance of such ecosystems, and thus provide theoretical foundation for the diffusion of innovative models of cooperatives and the promotion of sustainable development.

4. External intervention plays a key role in overcoming the lack of key resources such as shortage in talent, technology and funding when it comes to the cooperative development and industrial revitalisation in the poor areas. As a key element of cooperative ecosystem, external intervention determines the nature of that ecosystem, as well as the boundary and initial condition of cooperative development. Considering the Chinese context and the fact that NGOs in China is still underdeveloped, it is reasonable that government-led cooperative ecosystem has emerged in poor areas, but it is not the only ecosystem that works. Other effective ecosystems that are led by NPO (YouChange case), HEIs (CAU, SAU) and urban volunteers have been studied. The cooperative ecosystem perspective is helpful in reviewing rural development in poverty-stricken areas in China, especially the Chinese experience over the past five years in targeted poverty alleviation, the participation of all social sector and the empowerment of small farmers, providing theoretical foundation for future researches on rural revitalisation and sustainable development.

5. This report contributes to the scholarly debate on the need and the extent for government intervention in cooperative development through various case studies. For instance, a cooperative was directly established by the government in one case, while in another case the government only assisted other organisations or individual to develop cooperatives. At macro level, the government provided macro policy support and financial aid. At micro level, the government directly appointed an individual to establish a cooperative. The various case studies all lead to the conclusion that the government in poverty-stricken areas plays a key role in the development of cooperatives. From an ecosystem perspective, researches on the patterns of cooperative development in poverty-stricken areas will have methodological flaws if they ignore the factor of government intervention or excessively exaggerate impact of government intervention.

6. This report reviews the latest development, findings and experience in cooperative development and industrial revitalisation within Sichuan province and other poverty-stricken areas. It covers different industries, including main crop production, honey, fruit, potato, rural tourism, e-commerce, etc.; key challenges in cooperative development, including: land transfer, financial credits, talent development, technology supply and
service; different regions covering Tibetan, Yi and Yao ethnic groups; different groups of people (rural women and reverse migrants, i.e. university student entrepreneurs); different ways of external intervention, such as direct government intervention, skills training led by NGOs, participation of urban volunteers, and participation of HEIs. These case studies provide valuable insights in cooperative ecosystem and contribute to the studies on cooperative development.

7. Findings of this report may be applied to address the challenges in other developing countries or regions, from the perspective of interdisciplinary research design and stakeholders’ engaged implementation to address local challenges. In particular, this report demonstrates the value of ecosystem approach in bringing together multidisciplinary scholars to account the voices of different stakeholders, and small farmers in particular, grasp local knowledge and wisdom for innovative solutions to cope with the challenges they are facing.

8. Due to the experimental nature of this pilot and the impact of the COVID-19, gaps in research design, field research, literature review and theoretical overview can be identified by the publication of this report to further refine the concept of cooperative ecosystem.

For social impact of this project, the following conclusions can be drawn as follows:

1. It is confirmed that challenge-oriented research project can attract and engage with multiple stakeholders (effectively, a sound foundation to build an innovative platform for mutual trust, effective communication and close cooperation, and to identify common interests and develop new ideas and local solutions. This project focuses on dominant industries and local cultures in Sichuan and beyond (potatoes in Liangshan, honey in Aba, rural tourism in Tibetan and Yao Minorities areas, and organic agriculture in Yunnan), and starts from local challenges such as industrialisation, talent shortage, conservative mindsets and lacking of initiative resources, ends at the innovative platform and pathways for multiple stakeholders working together, and for UK and UoN to address above challenges.

2. Challenges facing poverty-stricken areas call for building a suitable platform for the participation and contribution from multiple disciplines (arts, humanities, natural and engineering science, social and management science), and multiple stakeholders (e.g. governmental agencies, non-government organisations, business entrepreneurs,
cooperative leaders and small farmers) to develop innovative, inclusive, feasible and sustainable solutions and roadmaps. Accordingly, the outcomes of this project can be summarised as follows:

1) upgrading existing Potato Science and Technology Backyard (STB) into ‘STB Plus’ model to bring together industrial and social entrepreneurs, humanities/social/management scientists, international companies and UoN for agricultural industrialisation and internationalisation in marginal areas of Sichuan and beyond;

2) established a Honey STB by adopting the ‘STB Plus’ model, disseminating this model to the initiation and establishment of other eight STBs in other fields of agricultural production and locations of Sichuan including marginal areas;

3) organised interdisciplinary field visits and roundtable dialogues with stakeholders to address challenging issues related to local pillar or advantageous industries (potato, honey, tourism), clarified vision/pathway/roadmap;

4) submitted investigation report, joint funding application and cooperation pitch to Sichuan Provincial Government and other relevant organisations.

3. A key contribution of this project is that it clearly points out the important role of social innovation in community development and rural sustainability as well as the impact of NPOs or social enterprises in tackling those challenges. The biggest challenge facing sustainable development in rural China is the lack of voice from small farmers, a gap which can be filled by strengthening the participation of social innovation and social entrepreneurs to connect top-down intervention with bottom-up development. It is equally important for NPOs to play a vital role in empowering small farmers and the disadvantaged such as rural women, which was demonstrated in the cases of e-commercial entrepreneurship training and mentoring programme and organic farm. This project has developed partnerships with NPOs such as YouChange, social enterprises such as Yunhe Forest School, Qionglai Beekeeping Cooperative and Biliyuan Organic Farm, providing innovative platform for multiple stakeholders including UoN’s academia and student entrepreneurs to develop and test new ideas for rural innovation and industrial development in the marginal areas of China and other developing countries.

4. Internationalisation is embedded in all of social impact cases recorded in this project across different sectors, which sets out clear vision and roadmap for UK-China collaboration in trade, investment and technological collaboration in fields such as potato seed breeding, high quality honey export, rural tourism and organic agriculture to boost domestic and international markets and contribute to poverty alleviation in the marginal
areas. This project has created a number of innovative platforms which allow British industrial players, governmental and non-governmental agencies to participate in and contribute to industrial revitalisation and rural sustainability in marginal areas of Southwest China, and to Sustainable Development Goals (SDGs) and Belt and Road Initiative (BRI) strategies for the UK-China cooperation in common interesting areas such as organic agriculture, food safety standards and climate change.

5. Finally, this project establishes a platform for student entrepreneurship education and training in UoN, UNNC, CAU, SAU and others, in the field of environmental protection, community development and rural sustainability in marginal areas of China and developing world. With support from YouChange Foundation and Yunhe Forest School, a collaborative consent has been reached to develop rural tourism in poverty-stricken communities in panda reserves in Sichuan. We look forward to the implementation of this plan once the COVID-19 pandemic come to an end.

In terms of student capability development goal, this project draws the following conclusions:

Firstly, this project has provided opportunities to take part in academic research and social practice for hundreds of UG and PG students from different subjects across different schools of SAU and CAU, through regular group discussions, methodological salons, online and offline field research, as well as joint thesis supervision. It enhances the existing partnerships between Sichuan and UoN, between UoN and SAU/CAU.

Secondly, the student survey results show that the four goals of student capability development (challenge-oriented, interdisciplinary thinking, cross-sectoral communication, research and innovation skills) are fulfilled through the different ways of student participation in this project. The survey also indicates that students generally agree their skills set have improved through their participation in this project, which in return suggests the project is successful and the goals are feasible, which can be used as evidences and references for research design alone the line of the SDGs and GCRF programme in the near future.

Thirdly, challenge-oriented research and ecosystem approach have had a big impact on participatory students, which helps them identify challenges in the reality, listen to and understand the constraints from small farmers. Through communicating with stakeholders, students discover the value and contribution of local knowledge and grassroot innovation in
tackling real challenges, and consequently broaden student’s vision and knowledge base. This provides new ideas and cases for educational reforms in agriculture in HEIs.

Lastly, the platform established by this project has offered opportunities for students to develop their interdisciplinary skills and thus gained their high praises. In general, this project sheds new light on high education reform to enhance the links between HEIs and society, and encourage students to participate in and contribute to community development (especially in poverty-stricken areas).

5.2 Policy Recommendations

Based on our research findings, this report proposes the following policy recommendations for the reference for relevant stakeholders, including: relevant departments of Chinese governments at all levels, agribusiness enterprises and investors, universities and research institutes, NGOs and civil societies, mainstream and non-mainstream media, etc.; international organisations, governmental and non-governmental agencies that are interested in rural sustainability and cooperative development in the developing world, as well as poverty alleviation in rural China and the impact of the Belt and Road Initiative (BRI) on the developing world; GCRF management agency, HEIs and research institutions, etc.

Following recommendations may be relevant to some of governmental agencies, agribusiness companies, relevant organisations, public and social medias in China:

1. Efforts should be made to build a platform for multiple stakeholders’ participation and contribution to cooperative development and local pillar industrial revitalisation;
2. Local governments should focus on initiating, creating and improving cooperative ecosystem in the region, which determines the conditions, boundaries and extents of government intervention. A good example is the governmental intervention in Beekeeping Cooperative in Aba Tibetan Prefecture, where the county government introduced a star cooperative from the outside to facilitate cooperative development.
3. Apply the framework of cooperative ecosystem to reveal and summarise successful cases in poverty alleviation and cooperative development in the past five years in order to understand conditions underpinning success and lessons learnt, and develop an indicator system and management software for government intervention;
4. Provide policy and financial support to vigorously encourage NGOs, HEIs and research institutes and urban volunteer groups to participate in rural revitalisation and cooperative development.

This report also calls for an unbiased view on the experience of the poverty alleviation campaign led by the government and participated by all sectors across China in the past five years, which is understudied because it does not follow the conventional principles of cooperative based upon the experience of cooperative development in the west. More than 10 cases presented in this report shows the value of cooperative ecosystem approach for understanding the cooperative development and rural sustainability in the context of the developing world. Nonetheless, this project offers following recommendations for UK-China cooperation in relevant areas such as trade, technology, education, arts and humanity, culture, communication, etc.:

1. Create a UK-China hub on rural innovation and entrepreneurship research to promote international research collaboration along the line of SDGs, BRI and poverty alleviation in the marginal areas of the developing world. By an international comparison on external participation or intervention (including government intervention), the hub could facilitate innovative and creative researches for better understandings on food security/safety, organic agriculture, rural tourism, cooperative development in China, and other countries of the developing world.

2. Establish several pilot demonstration zones for UK-China cooperation on organic agriculture and rural tourism in Southwest China, to explore pathways and mechanism for the co-development of cooperatives and the industrialisation and internationalisation of ecological agriculture, and facilitate leadership and entrepreneurship training for cooperative development and rural sustainability in the developing world.

3. Emphasis on challenge-oriented, interdisciplinary and stakeholder engaged methodology in research design and application to the Newton Fund or other joint funding schemes in the near future based on successful experience and formatting of the GCRF programme.
6 Appendix

6.1 UoN-SAU GCRF Team

Dr Bin Wu, PI of GCRF Project, Senior Research Fellow of HGI, UoN

Dr Bin Wu is a Senior Research Fellow in the Haydn Green Institute for Innovation and Entrepreneurship (HGI) and coordinator of China Research Group (CGR), part of Nottingham University of Business School. He owned a Bachelor degree in Physics, a Master Degree in Philosophy of Science, and his PhD in Human Geography was focused on rural sustainability and farmer innovation in marginal areas of China. His research interests include: rural sustainability and farmer innovation; internal and international migration, global labour market for seafarers, Chinese diasporas and community cohesion. Since his first English monography on Sustainable Development in Rural China: Farmer innovation and self-organisation in marginal areas published in 2003 (Routledge), he has published five edited volumes, four special issues and more 50 journal articles. His papers appeared in international journals such as: Agriculture and Human Values, Business and Society, Journal of Cleaner Production, Journal of Contemporary China, Ethnic and Racial Studies, Asian and Pacific Migration Journal. Currently, his research is focused on return migration and entrepreneurship in the context of urbanisation and rural revitalisation in China.

In the past ten years or so, Dr Wu has successfully designed and received research grants from international organisations (ILO, IOM), European Commission, UK and Italian government including Farmer innovation system in China’s Loess Plateau, under the ESPA (Ecosystem Services and Poverty Alleviation) programme jointly funded by NERC, ESRC and DFID (2009 to 2011). With a context of sustainable development goals (SDGs), Bin is initiating and coordinating a UoN-China research partnership in rural innovation and sustainability, involving: Chinese Academy of Social Sciences, Chinese Academy of Agricultural Sciences, YouChange China Social Entrepreneur Foundation, and Sichuan Agricultural University. He is a PI of UoN-SAU GCRF Pilot Project: Cooperative Ecosystem to empower small farmers in China: case studies of Sichuan.

Prof Xinhong Fu, Dean of Management School, SAU

Dr Xinhong Fu is a professor and the Dean of the School of Management of Sichuan Agricultural University (SAU). She is the State-Council Allowance obtained expert, the academic and technical leader of Sichuan Province, the consultant expert working for
Prof Fu is engaged in the teaching and researching work in the field of agricultural economic theory and policy, rural cooperative economy. She has led over more than 80 national, provincial and international projects. She has published more than 160 academic papers, including more than 60 journal papers indexed by SSCI, SCI, CSSCI and EI journals, and more than 70 core publications. She published 11 books. She also worked as the chief editor and deputy chief editor publishing nine set of textbooks. She won 21 research awards, two of them were Second Prize at provincial and ministerial level and 6 of them were third prize. Five of her achievements were adopted by the leaders of Sichuan Province. She has supervised 10 doctors and 82 masters.

Prof Xiyao Wang, Deputy Dean of Agricultural School, SAU

Dr Xiyao Wang is Professor of SAU, the State Council Special Allowance obtained expert. Prof Wang is national science and technology power precision advanced individual for poverty alleviation. She is academic and technical leaders of Sichuan province and chief expert of Potato Scientific & Technology Backyard in Butuo County. She was also a visiting scholar of University of Idaho. Prof Wang was awarded the first prize for scientific and technological progress of Sichuan province, the prize for scientific and technological progress of Ministry of Agriculture and Rural Affairs of China. She guided the "Xiaoping Science and Technology Innovation Team" and other students’ innovation and entrepreneurship teams, and won one international award, three national awards, and 14 provincial awards. Dr Wang is also Vice President of Sichuan Agricultural Technical Association, executive director of National Potato Industry Technology Innovation Alliance. Deputy Secretary of the Party Committee and Associate Dean of School of Agriculture.

Prof Shemei Zhang, Director of Farmers' Cooperative Research Centre, SAU

Prof Shemei Zhang is the candidate of Sichuan Tianfu Ten-thousand Person Plan, the reserve candidate of Sichuan Academic and Technical Leaders, the expert of "Agricultural and Rural Economic Reform and Development Research Think tank", which is the first
batch of new think tank of Sichuan Provincial Party Committee, the Vice Chairman of China Apiculture Economic Professional Committee, etc.

Prof Shemei Zhang has been engaged in scientific research and teaching work for more than 10 years and is committed to the development of agricultural industrial organisation, agricultural technical economy and other related fields. She has successively led more than 30 provincial-level and ministerial-level projects such as the National Natural Science Foundation of China and the sub-project of the National Bee Industry Technology System. She has won four provincial prizes, published six books and over 100 papers (48 of which are SSCI, CSSCI, CSCD indexed). Prof Zhang has been invited to present at over 30 national and international conferences. Five of her policy reports were approved by provincial leaders. She has supervised more than 20 master and PhD students.

Prof Gubo Qi, CIDGA of CAU

Prof Gubo Qi received her PhD degree in Agricultural Economics and had been visiting scholar in International Centre for development-oriented Research in Agriculture and the London School of Economics and Political Science. Her main research interests are: resource management and sustainable development, institutional and technological innovation in rural development, gender and development, international development cooperation, and comparative study on agricultural development in China and Africa. The regions of her research work cover more than 20 provinces in China and several countries in Asia and Africa, e.g. Cambodia, Ethiopia, Laos', Mali, Mongolia, Philippines, Tanzania, Thailand, Vietnam, and Zambia. Supported by the Ministry of Agriculture and Rural Affairs of the P.R. China, IDRC, UNDP, IFAD, SDC, IIED and etc., the research programs include farmer-cantered agriculture technology development, community-based natural resource management, agricultural adaptation to climate change, and circular agriculture. Supported by the Ministry of Science and Technology of the P.R. China and International Poverty Reduction Centre in China, she has worked together with research institutes from the UK, Brazil, and African countries, to conduct comparative study on agricultural cooperation, action research on Sino- Tanzania agricultural innovation cooperation, and study on international communication and cooperation mechanism in Poverty Alleviation of BRI.
Dr Baojiang Geng, Associate Professor of School of Tourism, SAU

Dr Baojiang Geng is Associate Professor and Head of Division of Tourism Management at School of Tourism, SAU; Entrepreneurship and innovation tutor of Sichuan Talent Exchange Center. His research focuses on rural tourism and community development. He has published three books, more than 10 papers, and hosted or participated in more than 30 research projects such as rural tourism planning, forest park planning and rural revitalization planning.

Dr Zhao Ding, Lecturer at the School of Economics, SAU

Dr Zhao Ding graduated with Bachelor of Economics and Master of Management from SAU and received his Ph.D. degree from the University of Kiel, Germany in 2018. He is currently a Lecturer at School of Economics of SAU, a member of the International Association of Agricultural Economists (IAAE), the American Association of Agricultural and Applied Economics (AAEA), and a member of the Sichuan Finance Association. He is a reviewer of Agricultural Economics, China Agricultural Economic Review, International Food and Agribusiness Management Review Research fields: financial inclusion, behavioral economy and finance. Research involves multiple disciplines such as development economics, finance, welfare economics, behavioral economics, and consumer economics. He has participated in a number of national and provincial scientific research projects, and published many SSCI and SCI academic papers.

Member list of UoN-SAU GCRF Team

<table>
<thead>
<tr>
<th>UoN, UNNC, CAU</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bin Wu</td>
</tr>
<tr>
<td>2</td>
<td>Scott McCabe</td>
</tr>
<tr>
<td>3</td>
<td>Kim Hua Tan</td>
</tr>
<tr>
<td>4</td>
<td>Nicole Yang</td>
</tr>
<tr>
<td>5</td>
<td>Yi Wang</td>
</tr>
<tr>
<td>6</td>
<td>Gubo Qi</td>
</tr>
<tr>
<td>7</td>
<td>Demei Niu</td>
</tr>
<tr>
<td>8</td>
<td>Wei Ye</td>
</tr>
<tr>
<td></td>
<td>Cooperative Policies and Government Engagement Research Group, SAU</td>
</tr>
<tr>
<td>9</td>
<td>Xinhong Fu</td>
</tr>
<tr>
<td></td>
<td>Name</td>
</tr>
<tr>
<td>---</td>
<td>---------------------</td>
</tr>
<tr>
<td>10</td>
<td>Yuying Liu</td>
</tr>
<tr>
<td>11</td>
<td>Guoqiang Liu</td>
</tr>
<tr>
<td>12</td>
<td>Ruixin Zhang</td>
</tr>
<tr>
<td>13</td>
<td>Jiping Chen</td>
</tr>
<tr>
<td>14</td>
<td>Wenyun Xiang</td>
</tr>
<tr>
<td>15</td>
<td>Lei Luo</td>
</tr>
<tr>
<td>16</td>
<td>Yuying Liu</td>
</tr>
<tr>
<td>17</td>
<td>Dakuan Qiao</td>
</tr>
<tr>
<td>18</td>
<td>Jiao Fan</td>
</tr>
<tr>
<td>19</td>
<td>Yushi Chen</td>
</tr>
<tr>
<td>20</td>
<td>Ziqi Liu</td>
</tr>
<tr>
<td>21</td>
<td>Shemei Zhang</td>
</tr>
<tr>
<td>22</td>
<td>Rui Chen</td>
</tr>
<tr>
<td>23</td>
<td>Jingmei Mo</td>
</tr>
<tr>
<td>24</td>
<td>Keyu Fang</td>
</tr>
<tr>
<td>25</td>
<td>Ya Luo</td>
</tr>
<tr>
<td>26</td>
<td>Jingzhi Liang</td>
</tr>
<tr>
<td>27</td>
<td>Yue Huang</td>
</tr>
<tr>
<td>28</td>
<td>Yanping Zhang</td>
</tr>
<tr>
<td>29</td>
<td>Qian Gong</td>
</tr>
<tr>
<td>30</td>
<td>Han Zou</td>
</tr>
<tr>
<td>31</td>
<td>Lanxin Li</td>
</tr>
<tr>
<td>32</td>
<td>Xinyu Chen</td>
</tr>
<tr>
<td>33</td>
<td>Zhuoying Fu</td>
</tr>
<tr>
<td>34</td>
<td>Zhao Ding</td>
</tr>
<tr>
<td>35</td>
<td>Yun Shen</td>
</tr>
<tr>
<td>36</td>
<td>Daochuan Yang</td>
</tr>
<tr>
<td>37</td>
<td>Jingye Zhang</td>
</tr>
<tr>
<td>38</td>
<td>Yuanyuan Liu</td>
</tr>
<tr>
<td>39</td>
<td>Chengcheng Hong</td>
</tr>
<tr>
<td>40</td>
<td>Yingwen Chen</td>
</tr>
<tr>
<td>41</td>
<td>Yuqing Lou</td>
</tr>
<tr>
<td>42</td>
<td>Liwen Yang</td>
</tr>
<tr>
<td>43</td>
<td>Ran You</td>
</tr>
<tr>
<td>44</td>
<td>Hongxi Guo</td>
</tr>
<tr>
<td>45</td>
<td>Xiaoying Duan</td>
</tr>
<tr>
<td>46</td>
<td>Xiaoli Chen</td>
</tr>
<tr>
<td>No.</td>
<td>Name</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------</td>
</tr>
<tr>
<td>47</td>
<td>Xiang He</td>
</tr>
<tr>
<td>48</td>
<td>Yuting Gao</td>
</tr>
<tr>
<td>49</td>
<td>Yixi Chen</td>
</tr>
<tr>
<td>50</td>
<td>Tingxiu Long</td>
</tr>
<tr>
<td>51</td>
<td>Xia Liu</td>
</tr>
<tr>
<td>52</td>
<td>Baojiang Geng</td>
</tr>
<tr>
<td>53</td>
<td>Jia Liang</td>
</tr>
<tr>
<td>54</td>
<td>Shenggang Peng</td>
</tr>
<tr>
<td>55</td>
<td>Lu Liao</td>
</tr>
<tr>
<td>56</td>
<td>Liping Zeng</td>
</tr>
<tr>
<td>57</td>
<td>Dandan Guo</td>
</tr>
<tr>
<td>58</td>
<td>Zhenlin Qi</td>
</tr>
<tr>
<td>59</td>
<td>Jing Huang</td>
</tr>
<tr>
<td>60</td>
<td>Biyi Deng</td>
</tr>
<tr>
<td>61</td>
<td>Xinyi Lin</td>
</tr>
<tr>
<td>62</td>
<td>Shimin Fan</td>
</tr>
<tr>
<td>63</td>
<td>Wanya Zhang</td>
</tr>
<tr>
<td>64</td>
<td>Jingzhen Li</td>
</tr>
<tr>
<td>65</td>
<td>Jingyi Yang</td>
</tr>
<tr>
<td>66</td>
<td>Yuanyuan Chen</td>
</tr>
<tr>
<td>67</td>
<td>Jie Huang</td>
</tr>
<tr>
<td>68</td>
<td>Xiyao Wang</td>
</tr>
<tr>
<td>69</td>
<td>Jie Peng</td>
</tr>
<tr>
<td>70</td>
<td>Yisheng Liu</td>
</tr>
<tr>
<td>71</td>
<td>Cuiqin Yang</td>
</tr>
<tr>
<td>72</td>
<td>Liping Yu</td>
</tr>
<tr>
<td>73</td>
<td>Mengsheng Deng</td>
</tr>
<tr>
<td>74</td>
<td>Chengcheng Cai</td>
</tr>
<tr>
<td>75</td>
<td>Yong Yang</td>
</tr>
<tr>
<td>76</td>
<td>Chi Xu</td>
</tr>
<tr>
<td>77</td>
<td>Shuang Ran</td>
</tr>
<tr>
<td>78</td>
<td>Qian Liao</td>
</tr>
<tr>
<td>79</td>
<td>Jiaxin Zhu</td>
</tr>
<tr>
<td>80</td>
<td>Mengxue Tang</td>
</tr>
<tr>
<td>81</td>
<td>Zhiwei Zhang</td>
</tr>
</tbody>
</table>
6.2 Summary of A Report of Joint Investigation and Collaboration Suggestion on Potato Industrialisation in Butuo

Background and Executive Summary

Promoting potato industrialization in the poor areas of Sichuan Province is an important outcome of University of Nottingham (UoN)'s Global Challenge Research Fund (GCRF) project on the theme of empowering small farmers through cooperatives development in China. In relation to the on-going national campaign of poverty alleviation, potato industrialisation in Liangshan Yi Minority Region, one of the poorest areas in China, has been listed as a top-priority of Sichuan-UoN cooperation. This was agreed at a high-level meeting between Sichuan provincial government and University of Nottingham in November 2019. Thanks to the support from Sichuan Provincial Government and Sichuan Agricultural University (SAU), a joint UoN-SAU investigation team was established and led Dr Bin Wu (PI of the GCRF Project), Professor Xinhong Fu (GCRF Project Coordinator) and Professor Xiyao Wang (Head of Potato Innovation Team of SAU) with the participation of 17 staff and students from SAU. The mission of the investigation team is to explore potential driving force, pathway and the role of UoN in potato industrialization in Liangshan.

Butuo County of Liangshan was selected to host this investigation due to two factors:

1. its representativeness to other poor counties in Liangshan in terms of geographic location, agricultural structure and economic development;
2. the existence of Butuo Potato Science and Technology Backyard (STB), a potato research and innovation diffusion station established by SAU set-up in 2019.

From 5 - 8 January 2020, the investigation team has had an intensive visit to Butuo County, covering a range of locations engaged in potato breeding, production, processing, circulation and sale, including relevant organisations, demonstrative projects, farmers’ cooperatives and village collective organizations. Through a series of formal and informal meetings, furthermore, team members had opportunities to contact and communicate with a wide range of people, including: government officers at different ranks, businessmen and women, external aid cadres who stay in villages for poverty alleviation project, village collective and cooperative leaders, and the number of Yi farmers’ representatives.

Professor Gubo Qi from China Agricultural University and Mr. Zonghong Wang, Director of Agricultural Department of Liangshan Prefecture Government, were invited to participate in and make contribution to this visit. All team members are satisfied with the results from this
field trip in Butuo and would like to express their sincere thanks to Sichuan Province and Butuo County Government for their support and coordination which contribute to the success of the visit.

This report is to summarise preliminary findings from group observation, communication with grassroots officials and Yi farmers in Butuo. It is also an opportunity for us to present opinions and comments from an interdisciplinary perspective as our team members have a range of disciplinary backgrounds (e.g. agronomy, agricultural economics, regional economics, finance, geography, management, sociology and anthropology, etc.). The executive summary highlights research findings, ideas and pathways for potato industrialisation, and suggestions for UoN-Sichuan cooperation.

It seems that potato industrialization in Butuo is not an easy process due to following factors or challenges. Firstly, the majority of Yi farmers can be characterised as traditional, small-scale, with low commodity rate, resistant to land transfer. Secondly, the attitude of Yi farmers to new technology is rather conservative, passive and heavily dependent upon government subsidies. Thirdly, there are many problems in potato supply chains, including: broken links, lack of processing technology, underdevelopment of industrial organisation and weak connections with the market. Fourthly, shortage of Yi talent is very large.

In response to the above challenges, this report proposes a new approach to potato industrialisation in Butuo County. It calls for a novel model of "Science and Technology Backyard (STB)", which contains two interwoven dimensions:

1. upgrading the function of current Butuo Potato STB as a new cooperation platform for external aid cadres working together to share information, good practices and external resources and opportunities for the development of village collective economy and professional cooperatives;

2. engaging with the University of Nottingham to bring together British potato company (James Hutton Ltd), Sichuan Xima Agricultural Bioengineering Ltd and other stakeholders for an international cooperation aimed at the development and promotion of high-quality Butuo seed potatoes in international markets.

The proposed model, which can be described as "Science and Technology Backyard Plus (STB+)", contains four major pathways (or projects) to achieve its goals:
1. Functional upgrading of Butuo Potato STB: introducing a new model of "supporting system for external aid cadres + Butuo Potato STB + international cooperation + village/cooperative development";

2. Functional optimization for better use of external aid cadres’ resources: Butuo Potato STB can be used as a hub for facilitating and coordinating external aid cadres’ activities horizontally for better sharing and use of information, good practices, and external resources/opportunities;

3. Potato supply chain development: extending potato supply chains from planning, organization, policy and other aspects to improve the connectedness with external markets;


We identified the following areas for developing Sichuan-UoN cooperation:

1. Technology cooperation: potato flavour science, processing and storage, new varieties and establishment of a cascade breeding system from Chengdu to Lijiang of Yunnan

2. Management science: extension of potato supply/block chains, international brand creation for Butuo potato, functional optimization of Butuo Potato STB and supporting system for external aid cadres;

3. Leadership and entrepreneurship training courses for village/cooperative leaders and returned migrants: it calls for a joint training programme to accelerate the inflow of talents and intelligence and "go out" (outreach) of cooperative leaders and local talents to lean from their counterparts and customers in the UK and Europe.

(Bin Wu, Xinhong Fu, Xiyao Wang, Shemei Zhang, Gubo Qi, Zhao Ding, Yun Shen)

6.3 List and links to blogs of the project

- [Connecting small farmers to big markets](#)
- [Pathway for poverty alleviation via potato industrialisation in China?](#)
- [Rural Revitalisation in China – Dr Bin Wu](#)
- [Empowering potato farmers in rural China](#)