

Themes of ECR Group Research and Profiles of Mentors

Theme 1: Systematic Innovation for Circular Agriculture

Research background

After more than 40 years of rapid industrialisation and urbanisation, China is facing both challenges and opportunities to transform its agricultural production system towards ecological sustainability. At present, the area of its agricultural land is about 9.682 billion mu (1 hectare=15 mu), or 67% of the total land area, and agricultural sector accounts for 62.4% of the total water consumption. In 2017, the agricultural sector generated only 7.9% of the national GDP but contributed over 50% of non-point source pollution. The amount of chemical fertilizer and pesticide application per unit of arable land is about 2.6 times and 2.5 times respectively of the world's averages.

The challenges facing China's agroecological system are closely related to the predominant style of its agricultural production system featured by the separation between crop production and animal breeding, which is responsible for waste straw and serious pollution of livestock and poultry manure. For example, the annual application of chemical fertilizers in China exceeds 60 million tons, but the utilisation rate is less than 35%, while the amount of livestock and poultry manure is about 3.8 billion tons but less than 60% in utilization rate.

The separation is also responsible for the substantial reduction of agricultural biodiversity. For instance, varieties of rice have declined from over 40,000 in the early 1950s to about 1,000 today, whilst wheat from over 10,000 to 500. The reduction in biodiversity has resulted in the decline of the resilience of its agricultural system to cope with climate change, diseases, pests and weeds.

Approach for Sino-UK research collaboration

The severe challenges facing China's agroecological system have offered a unique opportunity to transform its agricultural production system in order to meet the increasing and strong demand from Chinese customers for healthy, nutritious and high-quality food. Furthermore, the transformation of agricultural production systems is not limited to China but is a common goal for the international community as it is vital to achieve the United Nations' sustainable development goals (SDGs) and global "carbon neutrality".

For the transformation towards sustainable agriculture, there have been numerous

explorations, experiments, and good practices world-wide in the past decades which need to be shared in order to learn from each other. Furthermore, ecological agriculture has been rooted in Chinese traditional culture for thousands of years and it is worthwhile re-evaluating its potential. China has had substantial experience in research, experiment and promotion of ecological agriculture in the past, both success and failure, which needs further analysis.

Based on the above reasons, the aim of this initiative is twofold.

1. To bring together early career researchers (ECRs) from China and the UK to explore the pathways of transforming the agricultural production system from the separation to a combination or circulation between crop production and animal breeding in China and beyond.
2. To create a platform for ECRs to engage with multiple stakeholders (research institutes, agribusiness companies, government agencies, NGOs, and farmers' representatives or organisations) from the two countries for constructive communication and collaboration along the lines of global food security, sustainable agriculture and "carbon neutrality".

The above aim can be further divided into following goals:

- Identify interested stakeholders from China and the UK to participate in the Newton Researcher Links Workshop and subsequent research projects.
- Advertise, screen and select qualified ECR researchers from the two countries who are interested in interdisciplinary and stakeholder engaged research to join a research team co-led by Professor Wenliang Wu from China Agricultural University (CAU) and Dr Mark Taylor from James Hutton Institute (JHI).
- Conduct a systematic collection and analysis of relevant literature, data and cases both in China and in the UK to develop a research agenda for joint publications, funding applications, fieldwork design, etc.
- Develop an action plan with multiple stakeholders for joint research, experiment and demonstration, the roadmap of social impact in China, the UK and beyond.

Scope and focus of research collaboration

Given the nature of the complexity and initiative of research collaboration, we suggest three broad themes below for the consideration of ECR applicants. However, we do not rule out other topics if applicants make a strong case and justification against the theme of this stand described above paragraphs.

- 1) Technological systems or innovation models for circular agriculture by agroecological zones: challenges facing current agricultural production system, good practices/models in circular agriculture, the potential of the model in ecological, economic and social benefits, key factors or constraints behind the transformation, scenarios or projections for the system evolutions, etc.
- 2) Pathways or strategical analysis of the transformation towards circular agriculture in different zones in terms of geographic, ecological and economic conditions: What are challenges and opportunities for the transformation in the defined zone? What are good practices or cases which can be shared by other locations, regions and countries?

What are key factors or conditions behind, and how are they attractive and beneficial to the participation of local farmers?

- 3) Ecosystem building for the transformation to circular agriculture: What kinds of innovative or support ecosystems are needed for the transformation? What roles can different stakeholders (esp. universities, government agencies, responsible companies or social enterprises) play in building and maintaining the ecosystem? What good practices or lessons can be learnt from local, regional, national or international levels? How could Sino-British collaboration be beneficial to build favourable ecosystems to accelerate the transformation in China and beyond?

Related resources

Professor Wu of CAU established and led a research team on ecological agriculture and nutrition enhancement (EANE) since the 1990s with expertise in ecological recycling, selenium-enriched agriculture and organic agriculture. Comprising of more than 20 university faculties associated with the numbers of young researchers (doctoral and post-doc fellows), the team hosts or takes charge of:

- Five wild observation and test stations for environmental/ecological change.
- A national key Laboratory of Biodiversity and Organic Agriculture
- The Institute of Agricultural Ecology of CAU
- The Sino-US Joint Research Center for Agricultural Ecology and Sustainable Development
- The Sino-Swiss Joint Research Center for Organic Agriculture Research and Education.

As a pioneer in ecological agriculture and biodiversity research in China, the team has been deeply involved with government agencies at central and local government levels by providing consultation services for relevant policies or programmes in the past two decades, and is currently responsible for an annual national report on China Organic Food.

Stakeholders and their roles

The EANE team has developed partnerships with many research institutes across the country which can participate or contribute to this project in various stages. They include: Institute of Geography and Resources and Eco-Environment Research Center, Chinese Academy of Sciences; Rural Development Institute and Ecological Research Institute, Chinese Academy of Social Sciences; General Station of Resources and Ecological Protection of the Ministry of Agriculture and Rural Affairs, among many others.

EANE is a core member or plays leading role in following organisations: China Selenium Agricultural Industrial Technology Innovation Alliance, Chinese Community Support Agriculture Alliance, China Organic Agriculture Industry Alliance, Chinese Ecological Society, Chinese Natural Resources Society, and Chinese Society of Land Economics.

They can play a role as stakeholders in both hosting research and social impact.

Nonetheless, the project has the potential to bring a number of agribusiness companies to play some roles such as field research design and support, experiment and demonstration, entrepreneurship training.

Expected outcomes:

- 1) Two to three high-quality papers targeted at top international journals based on joint collection and analysis of good cases in China and Britain.
- 2) Present a transformation case to the ECR Researcher Links Workshop, facilitate communication and collaboration between ECR researchers and industrial delegates.
- 3) Develop research or pilot project proposals to potential government or industrial funding sources in China and the UK.
- 4) Prepare policy recommendations and blogs based upon the research findings in relevant topics.
- 5) Launch a "China-UK Circular Agriculture Salon" to bring together multiple stakeholders to develop common interests and research collaborations.

Theme 2: Digital Technology and Rural Transformation

Research background

In the past 10 years or so, we have witnessed an acceleration of development and application of digital technology (e.g. big data, e-commerce, smart agriculture), which has created both opportunities and challenges for the transformation of agricultural production and rural society, both in the developing and developed world.

As the largest developing and transitional economy in the world, China is a leading country in e-commerce, currently accounting for more than 42 percent of global e-commerce transactions, compared with 1 percent just 10 years ago. The sales record of China rural e-commerce reached 1.7 trillion Chinese yuan in 2019, or 16.1% of the total domestic e-commerce sales and the agricultural products sales by the rural e-commerce platform was 397.5 billion yuan (1 yuan RBM = 0.11 GBP). The agricultural products online sales have maintained a double-digit growth in the past 5 years.

Despite the great achievements in the digitalisation of agriculture, China is facing many challenges which relate to the disparity in regional development and on-going rural transformation. The regional disparities can be manifested as urban-rural and coastal-inland development gaps. Among the 904 million internet users in China in 2019, the urban users take about 71.8%, while the rural share is only 28.2%. For local government funding on rural information construction, about one quarter of counties invested less than 100,000 yuan in 2018, compared with one fifth of the counties over 5 million yuan (MARA, 2018).

In terms of rural transformation, the major challenge is the mismatch between the number of small-scale farmers (230 million) with low education and poor digital literacy and the demands for professional, networked scaled and digitalised agricultural entities. At present, agricultural digitalisation in China is still at the initial stage which is mainly distributed in the developed regions or high added values of agricultural products or organized farmers (e.g. farmers' cooperatives). As a result, digital agriculture accounts only 7.3% of the total agricultural added value in 2018, which is far below the figures for heavy industry (18.3%) and service industries (35.9%) in China. The third challenge, but not less importantly, is brain drains and shortage of talents in the countryside. Alongside the drop of rural labour force (from 60% in the share of national labour forces in 1991 to 26% in 2018), the share of the rural labour group above 60 years old is expected to reach 80% in next five years.

Approach and aim of Sino-UK collaboration in digital agriculture research

In the context of the UN sustainable development goals (SDGs), climate change and “carbon neutrality”, good practice and challenges in digital agriculture in China can be shared and addressed through a close research collaboration between NSFC-BC Newton early career researchers from China and the UK.

The central focus of this project is about the impact of digital agriculture on rural transformation referring to the establishment and development of an ecosystem for e-

commerce and digital technology application for agricultural production, sale and farmers' organisations. It involves multiple stakeholders (government agencies, research institutes/universities, public and private agricultural companies, e-commerce platform providers, farmers' organisations and customers representatives) and relationships between them.

Taking into account the ongoing transition from "targeted poverty alleviation" to "rural revitalisation" in China and Brexit in the UK, in particular, common challenges facing rural transformation and good practices or innovation cases will be jointly analysed and compared from an interdisciplinary or systematic perspective. Policy implications for rural reform and China-UK collaboration will be revealed through the participation and engagement with stakeholders from the two countries.

The aim of this project is therefore to bring together ECR researchers from China and UK to explore the pathways for research collaboration in innovation models and ecosystems of digital agriculture contributing to rural transformation, and to create a platform for them to engage with multiple stakeholders from two countries for constructive communication, interaction and collaboration along the line of cross-boundary e-commerce, sustainable agriculture, rural development in China, UK and beyond.

Key questions for ECR researchers' application and collaboration

As the first step of China-UK research collaboration in digital agriculture and rural development, we call for applications from early career researchers with multiple disciplinary backgrounds to address - but not be limited to - the following broad issues:

- 1) Innovation models and impact of digital technology or digital agriculture in the context of poverty alleviation, climate change, rural revitalisation and Brexit.
- 2) Partnerships or ecosystems for the participation and collaboration between stakeholders (governmental agencies, researchers or technical suppliers/transfers, business companies, and rural producers) building to address challenging issues facing producers and rural communities, and to better use resources and opportunities.
- 3) Potential markets (products and services) for Sino-UK digital agricultural collaboration with benefits to farmers (rural poor in particular) and rural transformation/revitalisation.

Research partners and resources

Center for International Agricultural Research at Chinese Academy of Agricultural Sciences

A national hub and international leading player in smart/digital agriculture research, which has carried out four rounds of large scale field research across the country and accumulated a large number of cases in digital entrepreneurship and agricultural supply chains management for poverty alleviation in rural China. Partnerships have been established with international leading companies for digital agriculture platforms including: jd.com, Alibaba.

University of Nottingham (UoN)

UoN is a leading institution in the world in the internalisation of higher education and UK-China research collaboration in sustainable agricultural and rural development. In relation to this project, there have been successful completion of two projects (GCRF project on cooperative ecosystem in poor areas of China, social impact project on UK-China e-commerce). UoN hosts a Haydn Green Institute for Innovation and Entrepreneurship (HGI) and Ingenuity Lab, a world class research centre and incubator for technology and social innovation and entrepreneurship.

University of Surrey

A leading player in facilitating UK-China innovation cooperation and entrepreneurship, including: digital technology, e-commerce.

China-Britain Regional Initiative

A consultant agency with the mission to promote UK-China regional government exchanges and facilitate UK-China technology transfer, investment and trade, economic development including agricultural collaboration at local level.

Anticipated outcomes

- Two to three high-quality papers to be published in international journals
- A Sino-UK Joint Seminar on Cross-border e-Commerce Cooperation
- Joint grant/funding applications for relevant fund schemes from both countries
- A few bases for Sino-UK digital agriculture experiment and demonstration.

Theme 3: Agroecosystem of Non-staple Grains, Agricultural Support & Food Security

Research background

In the context of global food security, climate change, and rural poverty in developing countries, an under researched field is the impact of government support (or intervention). This is particularly true for agricultural subsidy policies on the improvement of agroecological systems, achieving “carbon neutrality” goal, growing supply of healthy and nutritious food, as well as sustainable livelihoods for small farmers and their families. Previous research on food security and agricultural subsidy policies has been mainly focussed on staple food crops. By contrast, less is known about the impact of government support or financial subsidies on non-staple food crops (or underutilised crops, e.g. millet, sorghum, barley, oats, buckwheat, etc.) and small farmers’ livelihoods.

Limited research shows that non-staple food crops can help achieve sustainable development goals (SDGs) in many ways, including dietary diversity, biodiversity, and income growth of small farmers. The potential for the development of non-staple food supply and income growth among rural poor families, however, has not yet been fully recognised or achieved. This is because non-staple food crops are usually suitable for planting in specific areas, especially in some ecologically fragile and mountainous areas which are more likely to be occupied by small farmers and the rural poor.

For sustainable use of local resources to develop this crops production, it is necessary to initiate a systematic inquiry on business models and subsidy policies against different types of agroecosystems as well as their multiple effects on local environment protection, economic growth, poverty alleviation and the supply of nutritious and healthy food.

With the theme of financial subsidies for non-staple grain crops development and poverty alleviation, China is a good case study. In the past 20 years (and five years in particular), the Chinese government has made a big effort through a national programme (“targeted poverty alleviation”) in its mountainous and poverty-stricken areas where the accelerative development of non-staple grain crops was an important means of the government intervention. Despite a lot of reports of good practice in different locations across the country, there is a lack of systematic investigation and academic reflection in order to share the experience cross regional and national boundaries for the improvement of government intervention and agricultural subsidy policies.

Research aims

Given the complexity and diversity of non-staple food crops, this project takes an interdisciplinary and systematic approach to develop an understanding of the challenges facing the rural poor in non-staple cropping for their livelihood security, and good practices in different zones of agroecosystems and resource endowments related to financial subsidies for poverty alleviation, food security (health and nutritious food) and environment protection.

In particular, this project aims to:

- Explore the development models, successful experiences and cases, and challenging issues of non-staple food grains; analyse resource endowments, technical conditions, market demand and production potential of non-staple food crops; examine the impacts on non-staple grains on food security, farmers' livelihoods and local resource and environment.
- Compare the subsidy policies on non-staple grain crops by different countries and regions; construct an integrated interdisciplinary model of agriculture-economy-resources and environment-nutrition and health and use the model to optimise the subsidy plan to be more conducive to achieving SDGs.
- Propose an optimised reform plan for the subsidy of non-staple grain crops in China based on international cooperation and experiences; help local and central governments in China and other developing countries to reform or implement potential subsidy policies; promote the transformation of China and the global agricultural food system.

Team and resources

The research team is co-led by Professor Shenggen Fan from China Agricultural University and Professor Oliver Morrissey from University of Nottingham, UK.

Research partners include: Academy of Global Food Economics and Policy (AGFEP) at China Agricultural University, Business School and School of Economics at University of Nottingham, Rural Development Institute at Chinese Academy of Social Sciences, James Hutton Institute, Institute of Agricultural Economics and Development at Chinese Academy of Agricultural Science, China Academy for Rural Development at Zhejiang University, and International Food Policy Research Institute (IFPRI).

The research will be supported by two funded projects. One is "Optimising Chinese Agricultural Subsidies to Transform Agri-food Systems under the Global Context", a collaborative research project supported by National Natural Science Foundation of China (NSFC) and Consultative Group on International Agricultural Research (CGIAR). The other is "Systematic Innovation for Food Security in China" supported by this ECR Links Grant.

In addition to public government data and micro-household data released by academic institutions, this research can use the panel household data from National Fixed Point Survey (NFPS) implemented by the Rural Centre for Rural Economy at the Ministry of Agriculture and Rural Affairs of China, the data from "Agricultural and Food System Transformation Survey" by China Agricultural University, and China Agricultural Sector Model (CASM) by Chinese Academy of Agricultural Science.

Expected outcomes

- One or two high quality papers for the NSFC-BC Newton project workshop, and then submit to top international journals.
- One workshop for researchers, policymakers, non-staple food crops producers, and other stakeholders; associated with dissemination via blogs and social media.

- A few of bases for Sino-British collaboration in research, experiment and demonstration, entrepreneurship training for non-staple grain cropping, processing and service.
- One or two grant proposals to relevant funding schemes from two countries, and/or industrial sponsorships, etc.

Theme 4: Financial Inclusion for Improving the Access of Underserved Groups

Research background

Improving credit access to the agricultural sector and mitigating these credit constraints has emerged as a policy concern to address poverty and promote inclusive development for many developing economies. Access to better financial services for underserved communities is usually linked to the financial well-being of vulnerable groups, reducing inequalities as well as boosting economic growth.

The rapid rise of fintech innovations, such as mobile payments, online financial products, the digitization of financial services has transformed financial landscapes, shaped the processes of financial access, and promoted the development of inclusive digital finance. The development of fintech allows farmers and small and micro enterprises (SMEs) who are typically excluded from the formal financial system for most developing countries to obtain fast and affordable financial services and credits.

Agricultural insurance can act as a catalyst to for enhanced productivity via transferring the uncertainty of expected income and/or the value of collateral from farmers to insurers. This in turn reduces the probability of incident default on loans and increase farmers' credit access. Credit-linked insurance encourages farmers to borrow loans to invest in new projects. When a farmer's project fails, the farmer has the option of either paying the loan out of the indemnity funds received or default and use the funds for consumption or other purposes. Such risk transferring-and-managing mechanism would reduce the barriers for agricultural finance, allowing farm households to take advantage of lower costs of external finance.

In addition, agricultural value chain finance can effectively promote the connection between small farmers and agriculture and food systems. This can then help to mitigate uncertainty and risk and reduce the imbalance between supply and demand in rural financial markets. Value chain finance also has considerable information advantages over formal financial institutions to provide finance for farmers who could find it challenging to obtain credit at a lower cost. These can facilitate the development of different financial products for the needs of farmers and SMEs.

Our project aims at identifying barriers (e.g. financial illiteracy) to farmers and other small and micro enterprises in China and other countries obtaining loans and other forms of credit and understanding whether fintech innovations, agricultural insurance, guarantee scheme and agricultural value chain finance could be a solution for farmers and small and micro enterprises (SMEs) when they need access to finance.

Furthermore, our project will identify specific policy/regulatory changes that would be required to improve financial inclusion to address credit barriers to farmers and SMEs. We will outline the advantages and disadvantages of different ways to achieve the suggested changes (for example, legislative change or regulatory change). This will also guide the policy design to remove regulatory barriers to credit access and create an effective regulatory framework to provide more financial support for vulnerable populations and firms, e.g. female farmers, the elderly/young adults, the disabled, and farmers without financial knowledge. The project aims to offer not only insights for China, but also provide evidence to be learned by other countries.

Research aims

Little is known about barriers faced by farmers and small and micro enterprises (SMEs), access financial services and the social and economic benefits of inclusive finance. The aim of this project is to conduct rigorous research that will tackle a series of topics pertaining to financial inclusion, with emphasis on rural areas. To this end, this project will explore:

- 1) To what extent do fintech innovations promote credit access for underserved communities in rural areas, such as farmers, small and micro enterprises.
- 2) To what extent do agricultural insurance e.g. the credit-linked insurance, guarantee scheme and agricultural value chain finance relax financial constraints and improve financial inclusion in rural areas.
- 3) To what extent do financial literacy and financial capacity play a role in financial inclusion in rural areas.
- 4) The international experiences of removing regulatory barriers to credit access and solving financial difficulties for poor population groups.

Research partners and resources

- The Rural Development Institute (RDI) of Chinese Academy of Social Sciences (CASS) is one of top research institutions and thinking tanks specialised in rural development theory and policy in China. The Finance Group of RDI is pioneering in carrying out research, experiment and demonstration on micro-finance and credit for poverty alleviation and rural development in China since the mid-1990s. The group had successful experience in cooperation with the World Bank, Citigroup Foundation and other institutions/organizations to establish the "China Microfinance Center", "China Microfinance Development Promotion Association" and joint training courses for over 5000 microcredit talents alongside academic publications, research reports and policy recommendations to relevant stakeholders in China and abroad since 2000.
- Nottingham University Business School (NUBS) hosts a Global Centre for Banking and Financial Innovation (GCBFI), a leader in bridging theory and practice through cross-disciplinary research collaboration. As a recognised think-tank, the Centre uses its expertise to establish further strategic partnerships with world-leading business schools, financial institutions and the business community. GCBFI supports, enhances and facilitates cohesive research activities led by a group of highly motivated academics along with practitioners in the area of banking and finance.
- Centre for Research into Accounting and Finance in Context (CRAFIC) from the University of Sheffield and Centre for Global Finance (CGF) from SOAS University of London

Expected Outcomes

- Frontier knowledge in rural and agricultural finance will be exchanged, with high quality papers and ideas being presented and discussed, and the participation of practitioners.
- The academic linkage between ECRs will be established for their career development.

- Develop a "China-UK Financial Inclusion Salon" to bring together multiple stakeholders to develop common interests/research collaborations in the near future.

Theme 5: Pathways of sustainable tourism development and entrepreneurship

Research Context

Achieving the United Nations Sustainable Development Goals (SDGs) and the goal of 'carbon neutrality' calls for innovation models for sustainable rural tourism based on the protection of ecological and cultural diversity, urban-rural integration and knowledge share. It can hardly be addressed without an inclusive development to bring the participation from and share benefits with local smallholder farmers, and also balance/harmony development of organic (or circular) agriculture, food processing and service industries. In this regard, the developments in rural China over the past decade, especially the strong external interventions led by the government through its "targeted poverty alleviation" and "green development" in the past five years, has provided a lot of valuable cases to be shared and further investigated from multidisciplinary perspective. Meanwhile, it also raises a number of unresolved or new challenging issues to be addressed from the perspectives of methodological innovation and international experience. In relation to sustainable poverty alleviation, green development and smallholder empowerment, the challenging issues can be summarized as follows.

- **Industry matching model for sustainable rural tourism under different types of ecological and cultural conditions.** In the past, China's rural tourism models or relevant policies were concentrated on local tourism resources and market perspectives, lacking of a systematic view for the interconnection and interaction between ecological diversity conservation, integrated/harmony development between three industries (cropping, processing and service), cultural diversity protection and promotion, and reduction of carbon dioxide emission, etc. Such issues are important for the government's strategic planning of rural revitalization for next five years (the "14th Five-Year Plan") at all levels.
- **Inclusive development (or social innovation) model for sustainable rural tourism.** In the past, the initiation of rural tourism projects in the poor areas mostly relied on top-down government intervention or external capital investment in which local farmers and communities lacked opportunities to participate in decision-making or express their voices. As a result, they can do nothing but provided their land and labour, and many had a sense of being marginalised or a bystander mentality. For the sustainable rural tourism development in the new era, a salient question arises: how can local farmers be motivated to participate in and share benefits from rural tourism projects to better learn relevant knowledge and skills, improve service quality and standards, and develop a new pattern of win-win cooperation with local governments and foreign investors?
- **Pathways for sustainable rural tourism development.** In the past 10-20 years, there have been many successful cases in industrial and social innovation for sustainable rural tourism development, in China and other countries. It raises questions about the

pathways of learning, sharing and disseminating those cases, which cannot be done without a proper understanding of an ecosystem for sustainable rural tourism development, involving multiple actors (government, enterprises, universities, farmers' representatives and NGOs, etc.) working together to ensure smallholder farmers' participation and empowerment, and deal with the bottleneck problems such as the shortage of rural talents/entrepreneurs.

Project approach and aims

Based on the successful completion of the University of Nottingham's Global Challenge Research Fund project (Empowering small farmers in China) and established partnerships, the overall aims of this project are to:

1. develop a systematic innovation model for sustainable rural tourism by bringing together industrial innovation models, social innovation models and their ecosystems in order to address the challenges facing farmers' participation, sustainable agriculture and rural development in less developed areas of western China.
2. create a platform for UK-China collaboration in rural tourism through joint research, experiment and demonstration, talent exchange and entrepreneurial training. It will be carried out by a research team comprised by a number of ECR researchers with multidisciplinary background from China and the UK who will collect and jointly analyse good practices and cases, and engage with multiple stakeholders to build an ecosystem for long-term research collaboration and social impact.

Especially, this project aims to achieve the following objectives:

- 1) Summarise and refine several sustainable tourism development models that combine rural tourism and complementary industries in different ecological and cultural zones, including main elements, characteristics, scope of application, development conditions and potential, ecological and poverty reduction effects.
- 2) Develop several social innovation models for sustainable rural tourism, pathways and their impact on the local economic and social development, and ecological environment protection through analysing and comparing the structures and mechanisms of farmers' participation, community development, capital involvement and benefit distribution of different development models.
- 3) Explore the possibility and pathways to establish a few UK-China experiment and demonstration bases for the share and exchange of good practices, participation and collaboration of multiple stakeholders from the two countries, joint research and project design, talent and entrepreneurship training along the line of sustainable tourism development.

Participatory institutions, resources and roles

- 1) University of Nottingham Business School (Tourism Management, Haydn Green Institute for Innovation and Entrepreneurship): successful completion of GCRF project on tourism community development in Sichuan, responsible for design and coordination of the whole project.

- 2) University of Nottingham Ningbo China (Business, Economics), core member of completed GCRF project on rural tourism in Sichuan, responsible for hosting early career researchers' visit, entrepreneurship training and coordination of local exp & demo bases.
- 3) Sichuan Agricultural University (School of Business and Tourism), expertise in tourism development ethnic in minority areas and core member of the completed GCRF project, responsible for the coordination with local exp & demo bases.
- 4) Youcheng Social Entrepreneurs Poverty Alleviation Foundation, a charity dedicated to rural education, women's empowerment and entrepreneurship training, contributing to social innovation in the project design and implementation in exp & demo bases.
- 5) Yunhe Forest School, Ganzi, Sichuan, a social enterprise dedicated to environmental education and community development in ethnic minority areas, responsible for the selection and coordination of local participation.
- 6) China-Britain Regional Initiative, an advisory body dedicated to promoting exchanges between local governments, businesses and the private sector in China and the UK, responsible for liaising with relevant businesses and organisations in the UK and building a platform for cooperation and exchange between China and the UK on rural tourism.

Expected outcomes

- Two high quality academic papers
- Collection of ten cases of rural tourism as posters for the NSFC-BC Newton one event
- Organisation of regular online salons on Sino-British rural tourism cooperation

Profiles of Mentors/Advisors

Professor Wenliang Wu is the Professor of Ecology, Former Dean of Academic Affairs and College of Resources and Environmental Sciences of China Agricultural University, Director of Agroecology Institute of CAU, Director of the Beijing Key Laboratory of Biodiversity and Organic Agriculture. Professor Wu devotes himself to the carbon and nitrogen regulation of agroecosystem, interdisciplinary strategic research on organic agriculture, ecological agriculture, selenium-enriched agriculture, regional development and rural revitalization, and the study of compound and innovative talents in agricultural higher education. (Theme 1)



Professor Fengying Nie is Deputy Director of Agricultural Information Institute and Centre for International Agricultural Research, Chinese Academy of Agricultural Sciences (CAAS). She has led over 100 research projects funded by ministries of Chinese government and international organisations (FAO, WFP, IFAD, UNDP, IFPRI, World Bank, ADB, Ford Foundation). She has extensive research experience in food supply chains, e-commerce, empowerment of women, and agricultural research collaboration between China and Africa. (Theme: 2)



Professor Shenggen Fan is Dean of the Academy of Global Food Economics and Policies at China Agricultural University, and former Director of International Food Policy Research Institute. He has engaged widely on issues related to agriculture, food, health, climate change, natural resource management and information technologies. He is a member of the CGIAR System Board, the Global Panel on Agriculture and Food Systems for Nutrition; the Advisory Council of the Oxford Martin School at the University of Oxford; the Board of the Syngenta Foundation for Sustainable Agriculture; and the Council of Advisers of the World Food Prize. (Theme: 3)



Professor Tongquan Sun is Senior Research Fellow and the Head of Rural Finance Division in Rural Development Institute of Chinese Academy of Social Sciences (CASS). Before joined CASS, he had worked at the China International Centre for Economic and Technical Exchanges, a counterpart of UNDP, for more than 10 years in charge of planning and organising many international projects. (Theme: 4)



Professor Martin Lockett is Dean of Nottingham University Business School China, part of Nottingham Ningbo Campus (UNNC). He has over 40 years' experience in China with research experience in Chinese management and culture, economic reform and development, international trade and investment, and innovation. He has worked on consulting and executive education in mainland China, Hong Kong/ Macau, Malaysia and Singapore. (Theme 5)



Dr Mark Taylor is a group leader at the James Hutton Institute (JHI) based in Scotland. He is a plant molecular physiologist with extensive experience in potato research and potato innovation diffusion in Sub-Saharan African countries. He involves James Hutton Ltd (the largest potato seed breeding company in the UK/EU)'s overseas projects (including China, Central Asia and Africa) focusing on potato industrialisation and international trade. (Theme 1)



Professor Yu Xiong is Associate Dean International of the University of Surrey and Director of Innovation and Commercialization. His research focuses on technology development, sustainable and technological issues in global supply chains. He has published in and guest editors to many leading international journals. He has helped the growth of more than 100 companies and has brought in more than 26 million pounds investment to the UK's innovation projects. His webpage is at <https://www.surrey.ac.uk/people/yu-xiong>. (Theme 2)



Professor Oliver Morrissey is Director of the Centre for Research on International Trade and Economic Development of UoN and Managing Editor of the Journal of Development Studies since 2005. He has substantial research experience related to economic development policies in the developing world, especially Africa. Oliver maintains primary research interests in the economic analysis of aid, taxation and trade performance and policy, especially in Africa, and analysis of African household surveys. (Theme 3)



Professor Meryem Duygun is a Professor of Banking and Finance at Nottingham University Business School in the UK. She holds Aviva chair in Risk and Insurance. She co-directs the Global Centre for Banking and Financial Innovation. Professor Duygun is the Founding President of IFABS-International Finance and Banking Society and she directs the University of Nottingham Fintech Research Network. Her expertise is in the areas of risk, financial technologies (FinTech) and Insurtech, and her research attracted funding from UK Research and Innovation ESRC and the British Academy. She has been named on the "Women in FinTech Powerlist 2020" by UK Innovate Finance and has published numerous studies in leading journals. (Theme 4)



Professor Simon Mosey is Director of Haydn Green Institute for Innovation and Entrepreneurship at Nottingham University Business School and editor of the Journal of Technology Transfer. His research interests address technology entrepreneurship, entrepreneurship education and innovation management. His publications appear in leading academic journals such as *Entrepreneurship Theory & Practice*, *Research Policy*, *Journal of Management Studies*. He is Chair of the Young Entrepreneurs Scheme for entrepreneurial skills of over 5,500 academic researchers. (Theme 5)



Professor Dave Ross is CEO of Agri-EPI Centre Ltd, a UK Centre of Agricultural Innovation, growing the business and network globally. With over 100 industrial partners, Agri-EPI supports and delivers research, development, demonstration and training on precision agriculture and engineering to maximise the agri-tech sector's contribution to sustainable food production and supply. It is currently developing a UK-China SmartFarm partnership. The Profile of Agri_EPI at <https://agri-epicentre.com/> (Industrial Innovation Advisor)



Dr Jonathan Snape is CEO of James Hutton Ltd (JHL), a subsidiary company of James Hutton Institute. He is responsible for managing the Institute's IP Portfolio including an extensive list of plant variety rights which are licenced in more than 25 countries around the world (including China). He has more than 25 years' experience working at the interface between academia and industry. (Industrial Innovation Advisor)



Dr Tang Min is State Counsellor of the State Council of China and Deputy Chairperson of YouChange Social Entrepreneur Foundation. As a senior economist of Asian Development Bank (ADB), he had provided consultant services to Bangladesh and Pakistan' government for many years, later on was appointed to Resident Mission of ADB in China. He is a pioneer in China's social innovation with a focus on rural education, women empowerment and digital entrepreneurship training. (Social Innovation Advisor)



Mr Tiedong Yang is partner of China Britain Regional Initiative (CBRI) – a consultancy company based in Nottingham UK, and Shanghai China, specialising in UK-China region-to-region civic, people-to-people and economic projects. With established track records and comprehensive experiences since 2011, CBRI is currently focusing on geographical midlands in both countries with a strategic pathway to expand to the wider context. In 2010, he is awarded the Irish President's Award - Gaisce Gold Award by the Irish President for his achievements in Ireland. (UK-China Partnership Advisor)



Ms Min Rose is Deputy Director of Knowledge Exchange Asia, the University of Nottingham. Min has 23 years' professional experience of promoting UK-China collaboration across innovation, education, trade and investment, civic and cultural collaboration. She was the China Business Advisor for Leicestershire and then the East Midlands Development Agency between 2004 and 2011, when she supported over 500 companies and institutions in the East Midlands region to develop business links with China. (University-Industrial Partnership Advisor).

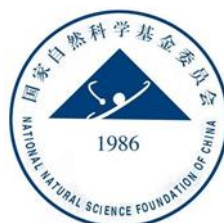


Dr Bin Wu is Senior Research Fellow of Haydn Green Institute for Innovation and Entrepreneurship, University of Nottingham. He has substantial experience in designing and delivering international and interdisciplinary projects in international shipping, internal and international migration, rural innovation and sustainability. Recently, he completed a GCRF project focusing on cooperative ecosystem in rural China. He is a coordinator of a UoN-China programme in rural entrepreneurship and sustainability.



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