

# **Systematic Innovation Approach for Future Rural Studies in the Global South: A Research Report on Building a Platform for UK-China ECR Collaboration**

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## Executive Summary

Achieving sustainable development goals (SDGs) calls for a close collaboration between the UK and China in agricultural and rural studies. With a focus on early career researcher (ECR) collaboration, two projects have been undertaken: a Newton-NSFC ECR Links Workshop-*Systematic innovation for food security and rural sustainability in China*, and a Newton Fund Research Links Grant Research Project-*UK-China Agri/rural research and innovation collaboration*. Above projects were based upon a systematic innovation approach (SIA), referring to a set of systematic principles, methods, and criteria applied for project design and delivery to cope with the complexity and bringing together multiple stakeholders for common interests and innovation cooperations. Accordingly, this report aims to: 1) provide an overview of bilateral research and innovation collaboration since the mid-2010s; 2) present research findings from an online questionnaire survey and the application of SIA to ECR Links project; and 3) report outcomes from these two projects, and building an innovative platform for bilateral ECR collaboration in the future.

This report consists of five chapters, including an introduction. Chapter 2 is based upon a desktop research to provide an overview of UK-China collaboration in agricultural and rural studies. Several research findings and knowledge gaps are identified along lines of common interests to address global challenges in sustainable agriculture and food security; agricultural research and innovation diffusion, leaving a large room for bilateral collaboration in social innovation and bottom-up development, and the creation of innovation platforms for bilateral ECR collaboration.

In focusing on the needs and opportunities for ECR participation in bilateral collaboration, Chapter 3 presents results from a bilingual online questionnaire survey from 93 industrial respondents (e.g. agribusiness companies, research and innovation institutes, membership organisations and non-profit organisations) from two countries. It shows that common interests exist to develop bilateral cooperation from industrial stakeholders and the potential roles that ECRs can play. It also illustrates the distribution and variations among respondents in terms of international experience, motivations, needs, and pathways for ECR engagement.

Chapter 4 concentrates on the application of the systematic innovation approach (SIA) to the design and delivery of UK-China ECR Links Workshop project. Taking into account the severe interruption and uncertainty caused by the global pandemic, a total of 41 ECRs from two countries were organised and trained through a series of online activities, including: The three key elements that are vital for the successful delivery of the project: a strong mentoring team comprised of more than 16 internationally renowned scholars and industrial leaders, a methodological training course for ECRs to learn and share the SIA approach, and participation of multiple stakeholders through roundtable meetings. This project ends at an establishment of a Consortium of Future Rural Studies (CFRS) with three strands: sustainable food and alternative livelihoods; innovation bases for industrial revitalisation; social innovation and entrepreneurship. Results from a feedback questionnaire survey show a high satisfaction rate from participatory ECRs.

Bringing together all of the research and project implementations, Chapter 5 concludes this report by summarising research findings, proposing joint action for future rural studies and policy recommendation. Research findings of this report can be highlighted as:

- 1) Sustainable development goals (SDGs) providing a sound base for the bilateral collaboration to which ECRs can contribute to a better understanding of local challenges and the share of good practices in the global south.
- 2) A novel methodological approach is needed for the ECR collaboration to account for the complexity, social innovation, intrinsic dynamics, pathways and interfaces between top-down intervention and bottom-up development in the developing world.

- 3) The necessity and feasibility of applying the SIA to build an innovation platform for ECRs to learn from and work with multiple stakeholders to address local challenges with constructive solutions.

Based upon the development and application of the SIA, this report proposes a Future Rural Studies (FRS) for bilateral ECR collaboration to: understand the challenges and opportunities in the era of the rural revitalisation of China; share good practices in sustainable food, poverty alleviation, and biodiversity protection in the global south; develop a research focus on the transformation and empowerment of over 500 million smallholder farmers through sustainable (or alternative) livelihood system. The value and potential of FRS are illustrated on CFRS' website ([here](#)).

Policy implications for bilateral ECR collaboration along the lines of FRS include: 1) a bilateral funding programme to support FRS as part of its bilateral commitment and collaboration contributing to SDGs; 2) establishment of a few FRS Hubs in global universities, both the UK and China to facilitate ECR collaboration across boundaries, develop the SIA approach and toolkits, foster pedagogical reform and new curricula development; 3) establishment of a few bilateral FRS Bases for the partnerships between ECRs, mentors and industrial stakeholders; 4) adding FRS elements into Rural Revitalisation Programme of Chinese Scholarship Council (CSC)'s Overseas Visiting Scholarship and UK Chevening scholarship programme.

## 1. Introduction

Global challenges in climate change, rural poverty and food security call for a close research and innovation collaboration between the UK and China, two leading countries representing the global north and south respectively. This is particularly true in the domain of agriculture and rural studies in the global south, in which two countries share a lot of common interests due to the following reasons. Firstly, both countries share commitment and responsibility to United Nations' sustainable development goals (SDGs) to which poverty alleviation and food security (both quantity and quality referring to safety, nutrition, and health) in the developing world should be classed as a top priority. Secondly, eliminating poverty and food security may be difficult to achieve without a transformation of attitudes and behaviours of over 500 million smallholder farmers who feed two-thirds of rural poor and low-income families in the global south. Considering nearly half (230 million) of the world's smallholder farmers live in China, its exploration and experience in cooperative development to empower small farmers since 2007, with the "targeted poverty alleviation" (2015-2020) and ongoing rural revitalisation programmes offer a unique opportunity and valuable insight to the process of rural transition and transformation of smallholder farmers in the global south.

Thanks to the global campaign of SDGs and a "Golden Era" of the bilateral relationship, both effective since 2015, we have witnessed rapid development in joint research and innovation collaboration with numerous achievements in agricultural and food studies. Dominating by technological innovation, however, less attention has been paid to good practices and social innovation in rural China. This might be constrained by both a better understanding of the conditions of sustainable food and rural transition there and the innovation diffusion of bilateral projects beyond the national boundary. Having gone through a tough time caused by the global pandemic, the global south is facing severe challenges in poverty reduction and food security. Now it is the right time for the UK and China to develop and enhance the bilateral research collaboration through a novel methodological approach to tackle the complexity at the local level and share good practices more widely.

This report intends to bring a systematic innovation approach to bilateral early career researcher (ECR) collaboration for agricultural and rural studies. The term *systematic innovation* denotes a process of interconnection and co-development between technological, social and policy systems to address challenges and opportunities facing smallholder farmers and the rural poor (Wu et al. 2020). The term *systematic innovation approach* (SIA) here refers to a set of systematic principles, methods, and criteria applied for project design and delivery to cope with the complexity and to foster innovations by bringing together multiple stakeholders for common interests and cooperations. For this report, the SIA contains two dimensions: interdisciplinary communication and collaboration across natural and social science boundaries; innovative platform building for ECRs and multiple stakeholders to develop common interests and roadmaps for research collaboration to address the challenges and opportunities towards sustainable food, poverty alleviation and rural transition in the global south.

The feasibility of the systematic innovation approach will be examined through two projects, Newton-NSFC ECR Links Workshop with the theme: *Systematic innovation for food security and rural sustainability in China*, and a research project of repurposing the Newton grant with the title: *UK-China Agri/Rural Research and Innovation Collaboration* for ECRs' industrial links. The latter has led to an online questionnaire survey on multiple stakeholders (e.g. industrial companies, investors and traders, research and innovation institutes, farmer associations and non-government organisations, etc) from two countries to express their needs, resources and preferences in bilateral research and joint innovation.

The survey was conducted through the joint effort of two consultancy companies, namely the Agri-EPI Centre, and China Britain Regional Initiative (CBRI). It was associated with several roundtable meetings to bring together ECRs and industrial stakeholders to develop common

interests and roadmaps of research collaboration contributing to the UK-China ECR Links Workshop (8-9 December 2021).

This report aims to: 1) provide an overview of UK-China research and innovation collaboration in agricultural and rural studies since 2015; 2) present research findings from the online questionnaire survey and ECR methodological training; and 3) report outcomes from two projects in terms of an innovative platform building for bilateral ECR collaboration in the future. The report ends at the conclusion and policy recommendations to develop future rural studies (FRS) in the global south.

## **2.UK-China collaboration in agriculture/rural research**

The bilateral cooperation between the UK and China in agriculture/rural research cannot be fully understood without a broad context of sustainable development goals (SDGs). From the lens of the systematic innovation approach (SIA), this chapter aims to examine signs of progresses, achievements, and knowledge gaps in this domain. Based upon desktop research, the relevant information is collected, analysed, and presented through four parts: bilateral strategical cooperation, joint funded programmes, platform building for ECR collaboration and the exploration of the SIA.

### **2.1 Bilateral strategical cooperation in the context of SDGs: An overview**

The success of COP15 (UN Convention on Biological Diversity in Kunming) and COP26 (UN Climate Change Conference in Glasgow) in late 2021 shows the importance of bilateral cooperation between the UK and China, and their contribution to the global campaigns in climate change, poverty alleviation and food security. This is particularly true for bilateral cooperation in agriculture and rural studies not only because China shares nearly a half of the world's smallholder farmers (500 million) whose participation and behaviour change are vital for the success and sustainability in terms of poverty alleviation and food system in the global south. Equally important is the leading role China plays in exploring new pathways of agricultural innovation and professionals' participation through the programme of "targeted poverty alleviation" (2015-2020) and the ongoing national campaign on rural revitalisation. From the perspective of systematic innovation, this session attempts to reveal the position of bilateral strategical cooperation, and its contribution to sustainable food and rural transition in the global south.

Reflecting on the "Golden Era" of the bilateral relationship between the UK and China, the bilateral cooperation in the agriculture and food sector has played an increasingly important role which can be seen by an appointment of an Agriculture Counsellor at the British Embassy in Beijing since 2015. It resulted in a doubling of the UK's food and drink exports to China over the period of 2013-2018 from £260m to £620m<sup>1</sup>.

Coincidentally with the start of the "Golden Era", the global campaign for SDGs was launched in 2015 which have profoundly influenced bilateral relationships in many aspects, and research and innovation collaboration for sustainable agriculture. Such an impact can be seen from a joint innovation strategy announced by UK Department for Business, Energy & Industrial Strategy (BEIS) and Chinese Ministry of Science and Technology (MOST) in 2017, namely "UK-China joint strategy for science, technology and innovation cooperation" (BEIS, 2017). In relation to the theme of this report, the strategy contains the following content:

- Addressing global challenges is listed as one of the most important strategical goals.
- Agriculture and food security is a top priority of bilateral innovation cooperation.
- Global partnerships to engage with third countries or international organisations.

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<sup>1</sup> For the report see <https://www.export.org.uk/news/481415/Food-and-drink-exports-to-China-soar-.htm>

- Flagship challenge programmes, which starts from agricultural technologies.
- Innovation platform building via joint research centres, innovation parks, and virtual communities to accelerate the transition and commercialisation of new technologies.

The UK-China Research Innovation Cooperation Partnership Fund (or Newton Fund thereafter) which has commissioned over £ 200 million, and has supported 460 projects and partnerships across more than 40 funding initiatives, reached 240 institutions across the UK and China (SAIN, 2018). Several programmes have been awarded in the areas of agriculture and food security (Baker, 2021), including: the STFC Newton Agri-tech programme (19 projects), Newton Fund Agri-tech Challenge 2017 (9 projects). In relation to the theme of this project, Newton Early Career Researcher (ECR) Links Workshop grant (British Council, National Science Foundation of China) aims to bring together ECRs from two countries to make international connections and improve the quality of their research (Baker, 2021).

To address global challenges, there are many programmes involving the third countries in the global south (Baker, 2021), including: UK-China-Philippines-Thailand-Vietnam Rice Research (13 projects)<sup>2</sup>; UK-China-Philippines-Thailand Swine and Poultry Research Initiative (4 projects). Not limited to the Newton Fund, furthermore, there are other channels or mechanisms for bilateral collaboration. For example, working in a partnership with Agricultural Technology Transfer (AgriTT) involved a trilateral initiative between the UK Department for International Development (DFID), the Chinese Government and the Governments of Malawi and Uganda and the Forum for Agricultural Research in Africa. An AgriTT Research Challenge Fund was set up to generate new thinking and practice for technology transfer, value-chain enhancement; knowledge sharing and communication (AgriTT, 2017).

Furthermore, the Global Challenges Research Fund (GCRF), a 5-year (2016-2021) £1.5 billion fund was a key component in the delivery of the UK Aid Strategy, and has also engaged with China, the largest developing country in the world. The GCRF aims to tackle key issues affecting developing countries through challenge-led multidisciplinary research; strengthening capability for research, innovation and knowledge exchange; providing an agile response to emergencies. With a focus on the bilateral collaboration to deliver the GCRF programmes in China, it aimed to bring together the best researchers and innovators from the UK and China to support economic development and social welfare, tackle global challenges and develop talent and careers (Baker, 2021). Agriculture and food were listed as one of the priorities alongside climate, energy, health, natural environment, sustainable industry, and cities. Session 2.4 provides a case of a GCRF pilot project in poorer areas of China.

## 2.2 Features of Newton funded programmes

Having provided a broad background of the bilateral research and innovation collaboration in agricultural and rural studies, the following paragraphs intend to highlight a few features of the Newton-funded programmes, including challenge-orientation, multidisciplinary collaboration, social impact, and industrial engagement.

The most salient feature of the Newton-funded programmes is challenge-orientation to address challenging issues facing either China or the global south. The former can be illustrated from awarded projects such as: “Precision crop disease management for farm productivity and food security” focused on potato disease identification and outbreak management; “Precision agriculture for family-farms in China” aimed to improve the use efficiency of nutrients and agri-chemicals in crop production in China. Another good example is the programme of Using Critical Zone Science (CZ) to Understand Sustaining the Ecosystem Service of Soil & Water (CZO), jointly funded by NERC and

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<sup>2</sup> <https://webarchive.nationalarchives.gov.uk/ukgwa/20200930164602/https://bbsrc.ukri.org/news/food-security/2018/180228-n-swine-and-poultry-research-initiative-to-address-microbiological-diseases/>

NSFC, to address the challenges facing China's ecological fragile areas (e.g. erosion, pollutants), and to improve the resilience of soils and water perturbations.

In terms of challenging issues in the global south, the bilateral collaboration involved third countries through the Newton Fund projects. For instance, a UK-China-Philippines-Thailand Swine and Poultry Research Initiative programme aimed to build on the combined strengths of academic research groups within China, the Philippines, Thailand, and the UK by working collaboratively to develop novel strategies in diagnosing, preventing, managing, or treating microbiological diseases of swine and poultry, to promote safe, healthy, resilient and sustainable food production systems in China and Southeast Asia (Baker, 2021).

The second feature of the Newton-funded programmes is multidisciplinary participation and collaboration to address the complexity behind the challenging issues and offer constructive solutions if possible. For food security in the global south, furthermore, the Newton Fund awarded a programme of UK-China-Philippines-Thailand-Vietnam Rice Research aimed to bring together relevant research groups within those countries to develop interdisciplinary research underpinned the long-term sustainable production of rice.

The third feature of the Newton-funded programmes is the emphasis on the pathway or delivery of social impact, both short and long-term. A good example is the STFC Newton Agri-Tech Programme aimed to make use of the UK's strengths in small satellite technologies and expertise in satellite-derived data products to provide facilities and technologies that could support research-driven, decision-making tools for farmers and policymakers in China and across the globe if possible. Another example is Newton Fund Research and Innovation Bridges Programme aimed to encourage innovative partnerships between the UK and Chinese businesses and research organisations to work on solutions to agri-tech & food, urbanisation, healthcare, and energy. One Agri-tech & food project focusing on sustainable intensification with emphasis on an integrated system approaches to address questions in the broader multidisciplinary, interdisciplinary, or trans-disciplinary contexts; application of agricultural technology (including remote sensing to agriculture) to support sustainable intensification (Baker, 2021).

The fourth feature of the Newton-funded programmes is increasing emphasis on the engagement with industrial stakeholders for joint research design and delivery to enhance the industrialisation or commercialisation of technological advances for economic growth at local, national, or international levels. A good example is Newton Fund Agri-tech Challenge aimed to encourage innovative partnerships between the UK and Chinese businesses and research organisations to work on solutions towards agricultural challenges in China. Nine projects have been awarded across: precision agriculture, agriculture digitisation and decision management tools; improving the efficiency of sustainable agricultural production; agricultural products processing. Launched in 2018, UK-China Agri-tech Flagship Challenge Programme, the first flagship challenge programme between UK and China as set out in the UK-China Science, Technology, and Innovation Strategy, focused on smart farms to develop intelligent technology, equipment, and facilities to make agriculture smarter, more efficient and more sustainable.

## **2.3 Building innovative platforms for bilateral ECR collaboration**

One of the important elements for bilateral collaborative programmes/projects is capacity building with the benefit to the career development of younger researchers. In the context of sustainable food, poverty alleviation and rural transition in the global south, a platform for ECR collaboration is important not merely because the challenge-oriented research needs mutual communication, learning, and interdisciplinary collaboration to understand the complexity facing local communities. Equally important is the participation and contribution of multiple stakeholders to find a pathway for the transformation of the perceptions and behaviours among hundreds of million smallholder farmers there. In this regard, building an innovative platform is vital for ECR's communication and collaboration across disciplinary (esp. natural and social sciences), sector (involving industrial

stakeholders), and national (bilateral or multilateral) boundaries to address the challenges and opportunities in China and the global south. The following paragraphs intend to show the variations of ECR collaborative networks from the perspectives of 1) actual or virtual platform building; 2) package for multiple stakeholders' participation; 3) opportunity for ECRs to communicate with and learn from local farmers directly.

For *platform building*, the UK-China Sustainable Agriculture Innovation Network (SAIN) established in 2008 is perhaps pioneering to promote bilateral collaboration in sustainable agricultural development contributing to global food security (SAIN, 2018). With the support from Prosperity Fund and DEFRA (Department of Environment, Food & Rural Affairs), the SAIN has created a platform, namely UK China Knowledge Sharing and Mutual Learning Platform to: 1) support the implementation of UK China cooperation initiatives in agriculture, food and environment sectors; 2) promote cross-disciplinary collaborations; 3) enhance communication and engagement amongst existing initiatives and stakeholders to maximize synergies and support policy development; and 4) foster new cooperative partnerships (SAIN).

Having been listed as a key outcome in the UK-China Strategic Cooperation, innovation platforms (including joint research centres) have been an important part of Newton-funded programmes. A good example is the Agri-Tech Newton Network (ATCNN)<sup>3</sup> aimed to develop and support new UK-China partnerships to address the challenges facing agricultural modernisation in China. It seeks to “translate UK excellence in satellite imaging, remote sensing, smart sensors, robotics and data-intensive science into new space-enabled solutions for productivity and sustainability in rural China”. The Network brings together business with academia and end-users across the UK and China through the joint development of innovative products, processes, and services to enhance self-sustainability.

Not limited to bilateral partnerships for ECR collaboration, furthermore, AgiTT Research Challenge Fund involved trilateral research teams from China, the UK and a developing country in Africa or Asia working on collaborative projects in agricultural productivity. In practice, it commissioned and supported eleven trilateral projects to test and transfer five technologies from China to low-income country partners and built the capacity of over 40 early career researchers (AgiTT, 2017: 12).

In addition to actual platforms or joint research centres for ECR collaboration, a few virtual ones have been built-up. A good example is the UK-China Virtual Joint Centre for Improved Nitrogen Agronomy with aims to increase the adoption of sustainable nitrogen management practices in China and the UK through the development and application of novel indicators of nitrogen use efficiency (NUE) for intensification (e.g. innovative fertilisers, novel sensors, crop varieties, manure management) and the adoption of farmers (e.g. through guidance documents, decision support systems, phone apps). Linking with other Virtual Joint Centres on agricultural nitrogen in Brazil, China, India and other collaborators across the world, an approach of 'Farm Platforms' has been developed, which encourages researchers “to develop economically and environmentally sustainable farm systems through research at the farm level” (CINAg).

Moving to the constructive solutions from bilateral programmes, the platform building offers opportunities for ECRs to develop their understanding, competencies, and networks across the disciplinary, sector and national boundaries. Three types of platform building can be recognised: crossing disciplinary among academia, single or package of solutions for interested farmers. The first type of platform building can be illustrated from a Newton EAR Links Workshop with the theme, Innovations in agriculture and food for healthy societies (Shanghai 2018), which provided a wonderful environment for ECRs from the UK and China to address challenges in Chinese

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<sup>3</sup> For the details see <https://www.rothamsted.ac.uk/international/china/atcnn>

agriculture and impact health, and to develop multi-disciplinary project proposals with the opportunity to pitch these ideas to a panel of experts<sup>4</sup>.

The second type of platform building is related to the application of advanced technology with the potential of benefits to small farmers. A good example is the project, Utilizing Earth Observation and UAV Technologies. It aimed to deliver pest and disease products and services to end-users in China by combining earth observation and modelling technology to develop pest and disease monitoring, forecasting and management service products for the Chinese Government and service providers who will determine the best areas to spray with pesticides, and to plan flight paths for Unmanned Aerial Vehicles to follow for precise spraying of crops.

The third type of platform is to produce an innovation package for the transformation of small farmers in China. Next Generation Rice Processing is a good example, which aimed to develop novel digital milling processes supported by AI software, a new business model, and an education programme to support technology uptake and changes in work practices. Another good example is Advancing Digital Precision Aquaculture in China (ADPAC) aims to advance digital precision aquaculture in China to address the challenging issues in this sector, especially extremely low production efficiency which is responsible for high labour intensity, high consumption of energy and water, and severe environmental pollution. This project attempts to tackle this challenge by applying Aquaculture 4.0 to initiate a process of the transformation from traditional small-scale to digital industrialised aquaculture in China and aquaculture worldwide.

With a focus on the *opportunity for ECRs to communicate with and learn from Chinese farmers* directly, two different approaches can be recognised. Most of the programmes or projects do not consider the role of farmers or treat them as beneficiaries only, without any contribution to the project design and implementation. By contrast, the second approach views farmers as important stakeholders whose knowledge or expertise cannot be absent from project design and implementation. The latter offers the opportunity for ECRs and farmers to develop mutual trust, respect, and the process to learn from each other. In addition to a detailed case in Section 2.4, below are a few examples along the lines of the second approach.

The PAFiC (precision agriculture for family farms in China) is a STFC-NSFC jointly funded project<sup>5</sup>. It aimed to improve the use efficiency of nutrients and agri-chemicals in crop production in China by addressing key technological, agricultural, and social or economic barriers to the use of precision agriculture methods in *commercial family farms*. Slight differently, the AgriTT programme adopted a *whole value chain approach* to innovation and technology transfer by linking producers, markets, and consumers, and encouraging added-value services around new technologies<sup>6</sup>. It also aimed to link the researchers with the policymakers and end-users, ensuring that the research results and technical innovations move into use.

Along the same vein, “Environmentally benign combination biopesticides: Transforming pest control in Chinese and UK agriculture”<sup>7</sup> creates a formulation combining fungal pathogens with pesticidal plant extracts for effective pest control by *combining field and laboratory studies* through the partnerships between research institutes and agribusiness companies from two countries. This project aimed to stimulate the growth of the UK and Chinese market, associated with safer working conditions, job opportunities and allowing local growers to receive a greater return.

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<sup>4</sup> For the workshop report see <https://blogs.nottingham.ac.uk/futurefood/2018/10/11/innovations-in-agriculture-and-food-for-healthy-societies-workshop-report/>

<sup>5</sup> For the details of this project, see <http://knowledgeshare.sainonline.org/wp-content/uploads/2017/04/Precision-Agriculture-for-Family-farms-in-China.pdf>

<sup>6</sup> For the details, visit the project website at <https://www.landell-mills.com/news/2017/7/13/successful-agritt-programme-generates-lessons-for-future-trilateral-cooperation-and-agriculture-technology-transfer>

<sup>7</sup> For the details see <https://gtr.ukri.org/projects?ref=104911>

## 2.4 Exploring a systematic innovation approach: A GCRF pilot project

The scope of UK-China collaboration is not limited to technology innovation for sustainable agriculture in China, but also social innovation for poverty alleviation, empowerment, and transformation of smallholder farmers. The latter is important for bilateral collaboration considering common interests and commitments to SDGs through different channels to the global south, such as international development aids or Belt and Road Initiative (BRI) programmes. For this purpose, a novel approach, systematic innovation approach (SIA) is vital to bring together all of the knowledge, resources and opportunities for research design and implementation in the marginal areas. This case attempts to shed new light on how bilateral collaborative projects offer an opportunity to develop and test the SIA for rural development studies in marginal areas of the global south.

### 2.4.1 Background

In the context of the SDGs, a salient challenge facing the international community is how to empower 500 million smallholder farmers who feed two-thirds of the population in the global south and the vast majority of them fall into the categories of poor or low-income families. Involving many interwoven factors (“poverty track”), sustainable livelihoods in the poor areas they are largely dependent upon an appropriate intervention from the outside to initiate a process of combining both technology innovation (better use of local resources for higher efficient and quality products/services) and social (or organisational) innovation (bringing together smallholders farmers for the better access and adaption to external markets for high economic return and resilience again various risks/uncertainties). Bearing in mind the domination of the top-down approach in terms of technology transfer and development bids, it is vital for sustainable food and rural development in the poor areas to identify the pathways of international participation and good practices in social innovation to release their intrinsic dynamic and innovative potential within local communities. In this regard, the completion of a UK Global Challenge Research Fund (GCRF) pilot project in China offers insight into the potential of UK-China collaboration to develop common interests in areas such as: biodiversity and cultural diversity protection, sustainable rural development in the global south.

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*. The overall aim of this project is to understand the composition, evolution, types of cooperative ecosystems and their impact on the initiative and development of cooperatives based on the practices of cooperative development in the poor areas of China. The project also intended to facilitate communications and collaborations among multiple stakeholders to develop a roadmap for improving cooperative ecosystems in this region through platform building. Nonetheless, it contributes to research collaboration and talent development in the areas of rural studies between the University of Nottingham and Chinese partners from universities, research institutes and social organisations.

Sichuan is selected for case studies not only because it represented agriculture and rural development in China's underdeveloped regions (Southwest China in particular). Equally important, it was a central battlefield of China's national campaign “targeted poverty alleviation” (2015-2020). Nonetheless, two MoU documents have been signed between the University of Nottingham (UoN) with Sichuan Provincial Government (2017) and Sichuan Agricultural University (SAU, 2018) respectively, in which agricultural research and innovation collaborations were listed as one of the top priority areas.

Starting from September 2019, a research team was jointly established by UoN and SAU with participation and support from China Agricultural University (CAU), University of Nottingham Ningbo Campus (UNNC) and Youchang China Social Entrepreneur Foundation, a leading NGO in China specialised in rural education and entrepreneurship training. The project successfully completed by 2020. (report [here](#))

#### 2.4.2 Research aim, methodology and findings

Bearing in mind the three interwoven aims (research, social impact and capability development), the research aims to develop an understanding of the challenges facing rural communities in poor areas of Sichuan, cooperative ecosystems and impacts on local pillar industries and livelihood security of the rural poor.

The above aim is addressed through a multidisciplinary team from the UoN (Schools of Business and Biosciences), SAU (Schools of Agriculture, Management, Economics and Tourism), CAU (College of International Development and Global Agriculture), UNNC (School of Business). The team is divided into five research groups comprised of over 40 staff and students from SAU:

- Cooperative policies and government intervention
- Pathway of cooperative leadership and entrepreneurship
- Rural finance and cooperative development
- Rural tourism development in ethnic minority areas
- Potato industrialisation and internationalisation in Sichuan

A one-week field research was arranged for core members of five research teams to visit Butuo, one of the poorest counties in Liangshan Yi Ethnic Prefecture<sup>8</sup>. This was a good opportunity for them with multiple disciplinary background to develop a common understanding, methodological approach and standards for group research design and implementation. Despite the interruption of the Covid-19 pandemic, regular online meetings were held afterwards for methodological discussion and project implementation.

Several research findings can be drawn from this project (Wu et al. 2020):

- 1) There is a significant knowledge gap between the principles of cooperative derived from cooperative development in the western world and the practices in the developing world where government intervention plays a more important role. To fill this gap, this project offers a 'cooperative ecosystem' approach to account for various factors and conditions that affect cooperative development, and to understand the diversity of cooperative development in poor areas in particular.
- 2) This project realises different types of cooperative ecosystems: government-led, NGO-led and university-led, leading to different pathways of cooperative development in poor areas. Adopting a cooperative ecosystem approach could help to understand Chinese experience in "targeted poverty alleviation" (2015-2020). It was led by the government and participated by all sectors in of society while cooperative development was listed as an important goal.
- 3) The scope of this project is featured by a range of coverage in terms of industries (mainly crops, honey, fruit, potato, rural tourism, e-commerce), key issues of cooperative development (land transfer, financial credits, talent shortage, technology supply and service), ethnic minorities (Tibetan and Yi), social groups (women and reverse migrants). More importantly, it shows different ways of external intervention: government intervention directly, skills training led by NGOs, participation of universities and urban volunteers.
- 4) Not limited to poor areas of rural China, this project demonstrates the value of the ecosystem approach by bringing together multidisciplinary scholars to account the voices of different stakeholders, and small farmers, grasping local knowledge and wisdom for innovative solutions in other locations or countries.

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<sup>8</sup> [Pathway for poverty alleviation via potato industrialisation in China? - Entrepreneurship at Nottingham](#)

#### 2.4.3 Social impact

The social impact of this project is to establish a platform facilitating communication and collaboration between researchers and stakeholders to address challenging issues by joint activities, action plans and policy recommendations. It started from the one-week fieldwork and methodological training in Butuo county with a focus on potato production, the main source of food and livelihood security for ethnic minorities in poor and mountainous areas of Sichuan, and the Yi Minority Region in particular. This offered a unique opportunity for the participation and support from multiple stakeholders, including provincial and local government, business companies that involved poverty alleviation projects, potato farmers and cooperatives and James Hutton Ltd, a leading potato seed breeding company in the UK.

For poverty alleviation and sustainable development in this region, this project 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 project offered policy recommendations to provincial and local governments to upgrade the STB's function by adding elements of social innovation and international collaboration for potato industrialisation in Liangshan Yi Ethnic Prefecture and beyond<sup>9</sup>.

Following up the successful model of Butuo Potato STB, the second collaborative platform, Chongxin STB, has been successfully built for beekeeping industrialisation and internationalisation in Aba Tibet Prefecture, another poor region of Sichuan, to promote high-quality honey export.

The following conclusions can be drawn from this project. Firstly, it is confirmed that a challenge-oriented research can attract and engage with multiple stakeholders effectively to build a sound foundation for mutual trust, effective communication in order to develop common interests, new ideas and local solutions. Secondly, challenges in poverty-stricken areas call for building a suitable platform for 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) working together to develop innovative, inclusive, feasible and sustainable solutions. Thirdly, this project demonstrates the importance of social innovation for community development and poverty alleviation through the participation of NGOs or social enterprises in poorer areas of China. Finally, internationalisation is a key element embedded in the project implementation, which sheds new light on the vision and roadmap of UK-China collaboration in sustainable agricultural and rural development.

#### 2.4.4 Capability development

Capability development aims is to support those students who participated in this project to develop their competencies in challenge-oriented thinking, interdisciplinary perspective, communication skills with different stakeholders as well as academic skills.

The above aim was addressed through the following channels or measurements: 1) project workshops, international events, and stakeholder meetings; 2) one-week field research and methodological training in Butuo, 3) participation in project design and implementation as members of five research groups; 4) three methodological salons to address common issues and share good experience among students; 5) joint supervision for student own project design and delivery.

More than one hundred students from SAU and CAU have participated and gained benefits from this project to various extents. A survey was conducted among participatory students about their participation, understanding, impact and satisfaction with this project.

The following conclusions can be drawn from this project. Firstly, it demonstrates the

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<sup>9</sup> [Empowering potato farmers in rural China - Entrepreneurship at Nottingham](#)

feasibility of methodological training online for university students through methodologic salons, joint research design and fieldwork, as well as joint supervision. Secondly, it has identified and tested key elements (challenge-oriented, stakeholder engaged, systematic thinking) for cultivating sustainability competences among university students in China and beyond. Thirdly, it illustrates the necessity of bilateral cooperation to build an innovative platform for multiple stakeholders to participate and contribute to sustainability competences for staff and students to address the challenges and opportunities in poorer areas of China and beyond.

## **2.5 Summary of desktop research findings and knowledge gaps**

Taking a systematic innovation approach (SIA) for agriculture and rural studies, desktop research has been conducted to review bilateral cooperation strategy since 2015, including major funded programmes, innovative platform building for ECRs and a case of GCRF pilot project in poor areas of China. Several research findings can be drawn as follows.

Firstly, it shows common interests and joint efforts have been made through bilateral research and innovation collaboration to address global challenges in rural poverty and food security. From the perspective of sustainable food and eradicating rural poverty in the global south, research gaps for further collaboration are identified to understand challenges, intrinsic dynamics, and good practices in the transformation of hundreds of millions of smallholder farmers, a key to achieving SDGs in the developing world.

Secondly, through multiple funding mechanisms (e.g. bilaterally and trilaterally), significant progress has been made along the lines of multidisciplinary research collaboration to address global challenges or national priority areas in sustainable agriculture, food security and environmental protection. With an emphasis on technological breakthroughs and application of new technology (e.g. digital technology), however, less attention has been paid to rural challenges and good practices at local levels. The latter is equally important, if not more, to understand the complexity facing marginal areas and rural poor in the global south, and to share China's experience or lessons in poverty alleviation and empowerment of smallholder farmers with other countries.

Thirdly, through the flagship challenge fund, it is a good initiative to promote stakeholder-engaged research for industrialised innovation, local economic growth, and the adoption of farmers (especially specialised farmers) in China. Having been predominated by technological innovation and top-down approach, however, good practices in social innovation and bottom-up development have been largely ignored in bilateral funded programmes. In this regard, the UoN GCRF pilot project in poor areas of China demonstrates the necessity and feasibility to bring a social innovation dimension into research design and implementation.

Fourthly, the bilateral collaboration in the past has made valuable exploration and significant achievement in innovative platform building for ECR collaboration across disciplinary, sector and national boundaries. More attention should be paid to the interconnection with, participation from, and benefits to hundred millions of smallholder farmers in the global south directly. Nonetheless, UoN GCRF pilot project offered a test to apply a systematic innovation approach for joint research design and implementation in poorer areas of China. The value and potential of SIA for platform building will be discussed in Chapter 4.

### 3. Needs of industrial stakeholders and opportunities for ECRs

With perspective to the needs and opportunities of the bilateral collaboration for ECR participation in the future, a bilingual questionnaire survey has been designed and conducted online as a part of implementing the repurposing project. This Chapter presents the results from the survey, and highlights research findings and implications for ECR collaboration.

#### 3.1 Online survey and profiles of participatory organisations

The questionnaire was designed to collect information from those organisations which have had experience, or have interests in or involved in, UK-China research and innovation collaboration in the domain of agriculture and/or rural development (see Annex 3 for the details). The targeted participants were those who can fill the questionnaire on behalf of their organisations, such as industrial enterprises, investment and trade firms, research and innovation institutions, government and non-government organisations, farmer cooperatives and/or associations. Given the questionnaire are both voluntary in nature with responses received anonymised for academic research only, a total of 93 organisations expressed their interests, needs and preferences to participate in the bilateral collaboration. Table 1 provides the profile of a sample of these organisations by type and geographic location.

**Table 1 Profiles of participatory organisations**

Type of organisation	No	%	Location-UK	No	%	Location-China	No	%
Industrial company	45	48.4	Scotland	8	34.8	West	25	31.7
R & I institute	34	36.6	South England	7	30.4	Southeast	23	29.1
Membership organisation	6	6.5	North England	4	17.4	North	22	27.8
Non-profit organisation	8	8.6	Others	4	17.4	Centre	9	11.4
<i>Total</i>	<i>93</i>	<i>100</i>	<i>Total</i>	<i>23</i>	<i>100</i>	<i>Total</i>	<i>79</i>	<i>100</i>

Notes: Location-UK: North England includes Northwest and Yorkshire; Others include Midland, Wales, North Ireland. Location-China: West includes Northwest and Southwest. Table 1 shows nearly a half (48.4%) of participatory organisations are industrial companies (agribusiness enterprises, investors and traders), over one third (36.6%) are research and innovation institutes, and the rest (15.2%) are either membership organisation or non-profit organisations (e.g. NGO, government agency).

In terms of locations of participatory organisations, there were 23 UK-based entities, of which 10 (or 43.5%) have branches in China, an indicator of strong business links between the UK and China among British respondents). Regardless of British branches in China, 69 Chinese participants share about three-quarters of respondents in total, while one quarter are British. Focusing on Chinese respondents, nearly one-third (31.7%) are located in the West, including Southwest and Northwest, whose participation might be related to the influence of the GCRF pilot project which focused in poorer areas of China.

In terms of the distribution of samples by country and the type of organisation, Table 2 shows that UK's respondents are dominated by companies (56.7%), followed by other (membership and non-profit organisations, 26.1%). This contrasts with the respondents from China, where there was a more balanced distribution between industrial companies and research institutes.

**Table 2 Distribution of samples by country and type of organisation (%)**

Country	Company	Institute	Other	Total (N)
UK	56.5	17.4	26.1	23
China	46.4	42.0	11.6	69
<i>Total</i>	<b>48.9</b>	<b>35.9</b>	<b>15.2</b>	<b>92</b>

Regarding the speciality of sample companies or organisations, Table 3 shows that most samples involved more than two areas (244.1%); application of new technologies and policy advice are shared by over 40% of the samples, ranked as the top two areas of speciality. Furthermore, significant differences can be found between the UK and Chinese respondents. On the UK side, the top 3 items are: development of new products or technologies (60.9%), application of new technologies (52.2%) and entrepreneurship training (43.5%). This contrasts with policy advice (49.3%), application of new technologies (43.5%) and investment, trade (39.1%) on the China side.

**Table 3 Areas of sample companies or organisations specialised (multiple choices, %)**

Areas of speciality	N	%	UK	China
Application/dissemination of new technologies	42	45.2	<b>52.2</b>	<b>43.5</b>
Policy advice, civil service, public support	40	43.0	21.7	<b>49.3</b>
Development of new products or technologies	35	37.6	<b>60.9</b>	30.4
Investment, trade and service provision	32	34.4	21.7	<b>39.1</b>
Entrepreneurship training, internship, career advice	29	31.2	<b>43.5</b>	27.5
Product design, promotion, branding	29	31.2	34.8	30.4
Voluntary service and support to rural people	20	21.5	13.0	24.6
<i>Total</i>	<b>227</b>	<b>244.1</b>	247.8	244.9

In terms of the distribution by sector, Table 4 shows that multiple sector services (315.1%) are a common pattern among participatory organisations, while the top 3 sectors are cropping (60.2%), environmental protection (55.9%), and animal husbandry (45.2%) respectively. It is noted that farmer's organisation accounts for 41.9%, ranked 4th, while rural services account for only 33.3%. Furthermore, no significant difference is founded between Chinese and British organisations in the sector distribution.

**Table 4 Distribution of samples by sector (multiple choices)**

Sector	N	%
Cropping (including seed breeding)	56	60.2
Environment protection	52	55.9
Animal husbandry	42	45.2
Farmer's organization	39	41.9
Food processing	32	34.4
Rural services (tourism, logistics, banking, credit)	31	33.3
Information system	22	23.7
Welfare and social protection	19	20.4
<i>Total</i>	<b>293</b>	<b>315.1</b>

### 3.2 Experience and interests of respondents for bilateral collaboration

Bearing in mind differences between the UK and Chinese participatory organisations in terms of size, expertise and sector, distinguishing features between the UK and Chinese samples are shown in Table 5. In addition to differences in establishment length and size of employment, the most striking difference between the UK and Chinese counterparts is the scope of business: nearly 80 percent of UK respondents are internationalised while over 70 percent of Chinese respondents are limited to the national or local level. As a result, the vast majority (88.4%) of Chinese respondents have little experience in international business and over half (56.5%) of Chinese respondents do not have any experience in bilateral collaboration. A certain caution may be required in reading the claims of the UK's respondents in terms of the share of international business (60.9%) and experience of growth in bilateral collaboration (40.9%) due to small size of samples.

**Table 5 Distinguished features of samples by country and indicator (%)**

	Item (year)	<3	3-10	11-20	>20
Establishment	UK	26.1	<b>39.1</b>	4.3	30.4
	China	13.0	31.9	14.5	<b>40.6</b>
	<i>Total</i>	16.1	34.4	11.8	37.6
No of Staff	Item (person)	<10	10-30	31-100	>100
	UK	<b>47.8</b>	26.1	13.0	13.0
	China	26.1	15.9	13.0	<b>44.9</b>
	<i>Total</i>	32.3	18.3	12.9	36.6
Scope of business	Item	Local	National	International	
	UK	4.3	17.4	<b>78.3</b>	
	China	<b>31.9</b>	<b>40.6</b>	27.5	
	<i>Total</i>	24.7	34.4	40.9	
Share of international business	Item	<30%	30%-60%	>60%	
	UK	<b>60.9</b>	26.1	13.0	
	China	<b>88.4</b>	5.8	5.8	
	<i>Total</i>	80.6	10.8	8.6	
Experience of UK-China collaboration	Item	None	Beginning	Growth	Stagnation
	UK	22.7	36.4	<b>40.9</b>	0
	China	<b>56.5</b>	34.8	7.2	1.4
	<i>Total</i>	47.8	35.9	15.2	1.1

Looking at the interest and motivation in participating in a bilateral collaboration, Table 6 indicates that research and development, and sustainable development goals are shared by over a half of respondents, ranked as top two motivating factors. Such results show a sound base and interfaces between ECRs and respondents in not only joint research and development between the two countries but also joint effort and contribution to the SDGs in the global south. Nonetheless, three factors: new market opportunity, internationalisation of products or services (including rural tourism), and technology transfer are shared by over 40 percent of respondents. Furthermore, Table 6 shows that respondents have multiple reasons or interests to participate in the bilateral collaboration (354.8%). Again, there is no significant difference between Chinese and UK respondents.

**Table 6 Motivation for UK-China collaboration (multiple choices)**

Motivation	N	%
<b>Research and development</b>	<b>51</b>	<b>54.8</b>
<b>Sustainable development goals (SDGs)</b>	<b>50</b>	<b>53.8</b>
New market opportunity	44	47.3
Internationalisation of products/services	41	44.1
Technology transfer	40	43.0
Investment/joint venture	36	38.7
Environmental/climate change	36	38.7
Import/export	32	34.4
<i>Total</i>	<b>330</b>	<b>354.8</b>

### 3.3 Needs from and pathways for ECR participation

Differentiating from general interest or motivation to participate in the bilateral/multiple collaboration, we asked respondents to provide specific needs listed in Table 7. Advanced technology, higher standards of production and attracting suitable talents or experts are shared by over a half of respondents, ranked top three. It is followed by access to overseas markets (45.2%), entrepreneurship/leadership education (45.2%), and consultancy services (41.9%).

**Table 7 Specific needs from the UK-China collaboration (multiple choices, %)**

Needs	No	%	Company	Institute	Other
Advanced technology	61	65.6	<b>64.4</b>	<b>67.6</b>	64.3
Higher standards of production	50	53.8	<b>53.3</b>	44.1	<b>78.6</b>
Suitable talents/experts for development	47	50.5	40.0	<b>55.9</b>	<b>71.4</b>
Access to overseas market	42	45.2	<b>53.3</b>	23.5	<b>71.4</b>
Entrepreneurship/leadership education	42	45.2	35.6	44.1	<b>78.6</b>
Consultancy services	39	41.9	33.3	<b>47.1</b>	57.1
Investment/joint venture	34	36.6	42.2	26.5	42.9
Market brand to promote local products	31	33.3	33.3	23.5	57.1
<i>Total</i>	<b>346</b>	<b>372.0</b>	<b>355.6</b>	<b>332.4</b>	<b>521.4</b>

While no difference can be found by the country of an organisation's base, Table 7 shows significant differences of those members or non-profit organisations (Other in the last column) from companies and research/innovation institutes. The differences can be further summarised from three aspects. Firstly, other respondents show stronger needs and wider interests in bilateral collaboration indicated by the highlighted cells and the total of 521.4 percent, 170 percent to 190 percent higher than Company and Institute groups. Secondly, their demands are higher in almost every item than other groups. Thirdly, higher standards of production and entrepreneurship/ leadership education are shared by nearly 80 percent of this group member followed by talents and access to overseas market, over 70 percent, 30 percent higher than the other two groups. Nonetheless, slight differences can be found between Company and Institute groups: the former gives more weight to a higher standard (53.3%), access to overseas market (53.3%), investment/joint venture (42.2%) while the latter to talents/experts (55.9%), consultancy service (47.1%) and entrepreneurship education (44.1%).

In relation to the potential roles of ECRs participating in bilateral cooperation, we asked respondents to specify what support could help their business from the participation in the bilateral

collaboration. Table 8 shows, generally, opportunities to meet their counterparts are listed as the top, shared by over two-thirds (68.8%) of respondents. It is followed by: information, attending industrial meetings, joint applications for government funding, and joint research opportunities, all of which account for over a half of respondents. Like the distribution patterns shown in Table 7, membership and non-profit organisations show stronger interest to participate and engage in all types of activities, and especially industrial meetings, entrepreneurship training, information provision and joint research. It is worth noting that companies highly value opportunities to meet their counterparts' partners (82.2%), followed by information (62.2%) and industrial meeting (57.8%). This contrasts with the research and innovation group which emphasises on joint applications for government funding (73.5%), followed by meeting partners, joint research and entrepreneurship training, all of which share over half of group members (52.9%)

**Table 8 Pathways of participating in bilateral collaboration (multiple choices, %)**

Support needed	No	%	Company	Institute	Other
Opportunities to meet partners	64	68.8	<b>82.2</b>	52.9	64.3
Information for technology, market, etc.	52	55.9	<b>62.2</b>	41.2	<b>71.4</b>
Attending industrial meetings	51	54.8	<b>57.8</b>	41.2	<b>78.6</b>
Joint application for government funding	50	53.8	35.6	<b>73.5</b>	64.3
Joint research on innovation, product design	49	52.7	46.7	52.9	<b>71.4</b>
Joint entrepreneurship training, internship	40	43.0	24.4	52.9	<b>78.6</b>
Joint research focusing on overseas market	39	41.9	37.8	38.2	64.3
Joint application for industrial funding	33	35.5	22.2	47.1	50.0
<i>Total</i>	378	406.5	<b>368.9</b>	<b>400.0</b>	<b>542.9</b>

At the end of the survey, we asked respondents to express whether they are interested to meet researchers and their counterparts; discussing collaboration with research/innovation institutes, or attending an online UK-China Collaboration Workshop (9/12/2021). Table 9 shows the vast majority (over 80%) were interested or had strong interests for involvement. Bearing in mind the nature of the anonymous survey, two-thirds (67.7%) of respondents provided contract information, of which 23.8 percent are from the UK, and 76.2 percent from China, an indicator of strong interest and desire to participate in platform building.

**Table 9 Interests to initiate or participate in following meetings in the short term (%)**

Channel	Item	No	No at all	A little	Yes	Strongly	N.A.
Online meeting with researchers	92	4.3	18.5	31.5	41.3	4.3	
Online meeting with counterparts	59	5.1	13.6	25.4	52.5	3.4	
Online meeting with institution	60	6.7	13.3	30.0	46.7	3.3	
Online Workshop on 9/12/2021	56	5.4	10.7	35.7	39.3	8.9	

### 3.4 Summary of survey findings

With the intention to identify the needs and opportunities for ECRs to engage industrial stakeholders and to build an innovative platform to contribute to bilateral collaboration, this Chapter has presented the results from the online survey. Based upon the analysis of 93 samples from two countries, survey findings can be summarised as follows.

Firstly, the survey shows a balanced distribution of respondents who are interested to develop bilateral research and innovation collaboration: nearly half of which come from industrial companies (48.4%), followed by research & innovation institutes (36.6%), and membership and non-profit organisations (15.1%). It seems that the demand to develop bilateral collaboration is stronger

on the China side accounting for three quarters of respondents whilst over 40 percent of British respondents have their branches in China, indicating strong bilateral business links.

However, significant differences can be found between British and Chinese companies or organisations in terms of established years, number of staffs, scope of business and international experience. It is noted Chinese participants are less experienced in international business and bilateral collaboration compared with their UK counterparts.

Focusing on the region of Chinese respondents, it is worth noting that around 60 percent of them come from Central and Western Regions, indicating a stronger demand or interest to develop bilateral collaboration from those less developed regions of China.

Secondly, the survey identifies multiple factors or motivations behind the participation of multiple stakeholders, of which research and development, sustainable development goals (SDGs) are ranked as the top two. Considering the geographic distribution of Chinese respondents and the impact of the GCRF pilot project, the above results seem to confirm that the interconnection between bilateral collaboration and SDGs could attract and contribute more to rural development in less developed regions and rural poor, both in China and the global south.

Thirdly, there are some common needs for bilateral collaboration, including: advanced technology (65.6%), high standards of production or service (53.8%), talents or experts (50.5%). Compared with industrial companies and research institutes, however, membership and non-profit organisations show strong interests and multiple needs for bilateral collaboration, including higher standards and entrepreneurship leadership education (78.6%), talents/experts and access to over market (71.4%). All of the items are more than 20 percent higher than participants from companies and institutes.

Finally, the survey shows several opportunities that the ECRs can exploit, including creating opportunities for multiple stakeholders to meet and share information, and develop joint research or funding application, etc. It identifies different ways for ECRs to meet special needs from different stakeholders. For instance, over 80 percent of company respondents show special interests to meet their counterparts, while nearly three-quarters of respondents from research and innovation institutes are keen to find opportunities from government funding programmes. By contrast, membership and non-profit organisations (other in Tables 7 and 8) express strong needs in attending the industrial meeting, joint entrepreneurship training, relevant information and joint research project.

## 4. Systematic innovation approach for bilateral ECR collaboration

Having reported the research findings in Chapters 2 and 3, this chapter aims to summarise the process and outcomes of applying the systematic innovation approach (SIA) for an innovative platform building which allows ECRs to develop collaboration across disciplinary, sector and national boundaries. It contains four parts: background and process of the ECR Links project, key elements of platform building, outcomes from this project, feedback and evaluation from ECRs.

### 4.1 Background, aims and process of UK-China ECR Links project

For sustainable food, poverty alleviation and rural transition in the global south, a common dilemma facing ECRs is the lack of experience, opportunity and competencies to undertake effective communication across disciplinary (esp. between natural and social sciences), sector (outside the world of academia), national/cultural boundaries to better understand challenges and opportunities. To cope with this challenge, the systematic innovation approach (SIA) offers an effective means to build up an innovation platform for ECRs to develop their academic career and competencies for interdisciplinary and stakeholders' engaged research design and implementation. The term *SIA* refers to a set of systematic principles, methods, and criteria applied for project design and delivery to cope with the complexity and bring together multiple stakeholders for common interests and innovation cooperations. The exploration and application of SIA can be tracked back to a number of

research focused on rural transition and sustainability in China (Wu, 2003; Wu, 2014; Wu and Pretty, 2004; Wu and Zhang, 2013; Zhang and Wu, 2018).

The value and feasibility of the SIA for ECR collaboration can be illustrated from the exploration in the past decade, including: “Farmer innovation system in the Loess Plateau of China: An international research and training network” (2009-2010, project webpage), a part of UK’s ESPA Programme (Ecosystem Services and Poverty Alleviation); International Workshop for Global-local Knowledge System for Rural Innovation and Entrepreneurship in the developing world in May 2019<sup>10</sup> and GCRF Pilot Project in the Poor Areas of China in Session 2.4.

The above achievements have provided a sound base for the design and successful application to Newton Fund ECR Links Workshop project with the title: “*Systematic innovation for food security and rural sustainability in China*”. The project is jointly hosted by Nottingham University Business School (NUBS) and Rural Development Institute of the Chinese Academy of Social Sciences (CASS) with participation and support from James Hutton Institute (JHI), Centre for International Agriculture Research of the Chinese Academy of Social Sciences (CAAS), China Agricultural University (CAU), University of Nottingham Ningbo China (UNNC) and Sichuan Agricultural University (SAU). This project has two interwoven aims:

- To facilitate interdisciplinary research collaboration for ECRs from China and the UK to address challenges and opportunities related to sustainable food, agricultural and rural transition in China and the global south.
- To create a platform for ECRs, mentors and multiple stakeholders from two countries to develop common interests and roadmaps for joint research, collaboration and innovation in sustainable agriculture and rural development.

This project has successfully attracted 41 ECRs from 30 universities or research institutions to participate. Among the registered scholars, 23 (56.1%) from China, 15 (36.6%) from the UK, and 3 (7.3%) from other countries (Germany, USA and Canada). In terms of gender balance, 19 (46.3%) are female and 22 (53.7%) are males.

Bearing in mind the interruption caused by the Covid-19 pandemic, all activities of the project implementation were arranged online, which can be divided into five stages:

- 1) ECR group meetings with mentors to present their academic papers or ideas for bilateral collaboration, constructive comments from mentors and identifying common interests to develop research collaboration in the future.
- 2) Methodological salons to address common needs or limitations among ECRs, sharing of experience and advice from mentors and other ECRs.
- 3) Roundtable meetings between ECRs and multiple stakeholders from two countries to develop common interests and roadmaps for follow-up collaboration.
- 4) Two-day online workshop to bring together all ECRs, internationally renowned scholars, representatives of key stakeholders and other interests to present achievements from ECRs networking activities, share advice and good experience from invited panellists, and develop roadmaps for future collaborations between ECRs, mentors and stakeholders;
- 5) Post-event meetings to consolidate the achievements from the Workshop and developing a charter for bilateral ECR collaboration in sustainable agricultural and rural studies.

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<sup>10</sup> [Global-local knowledge systems for innovation and entrepreneurship in the developing world: An international workshop in Nottingham, 2-3 May 2019 - Future Food](#)

## 4.2 Key elements of preparing UK-China ECR Links Workshop

This project has three core elements to attract ECRs' participation and the delivery of the project aims: mentoring team, methodological training, and of stakeholders' participation.

### 4.2.1 Mentoring team: Established researchers and industrial leaders

The most distinguishing feature of this project is a strong mentoring team comprised of both internationally renowned scholars and industrial leaders whose expertise covers almost all fields related to sustainable agriculture and rural development. The geographic coverage of their expertise is not limited to China, but all of Continents of the global south. Table 10 provides a list of those who have made a significant contribution to this project in various stages.

**Table 10 List of mentors, titles and affiliations**

No.	Name	Title and Affiliation
1	Prof. Shenggen Fan	Dean of Academy of Global Food Economics and Policy, CAU, former Director General of the International Food Policy Research Institute between 2009 and 2019.
2	Prof. Xiaoyun Li	Founder and Honorary Dean of College of International Development and Global Agriculture (CIDGA), CAU.
3	Prof. Fengying Nie	Deputy Director, Centre for International Agriculture Research, Chinese Academy of Agricultural Sciences (CAAS).
4	Prof. Peter Ho	Chairman of ICARDC (International Conference on Agricultural and Rural Development in China) Network and Editor of the Cambridge University Press on Global Development Series.
5	Prof. Wenliang Wu	Former Dean of Academic Affairs and College of Resources and Environmental Sciences, CAU.
6	Prof. Gubo Qi	Professor of CIDGA of CAU with expertise in rural sustainability, innovation diffusion, and social innovation in China and Africa.
7	Prof. Xiyao Wang	Professor at Sichuan Agricultural University (SAU), chief scientist in potato innovation for poverty alleviation in Sichuan. She is the founder of Potato S & T Backyard in Liangshan.
8	Prof. Songliang Wang	Expertise in agroecological approach for project design, experiment and demonstration, and application to curriculum and ECR training courses based upon Fujian Agriculture and Forestry University (FAFU).
9	Dr. Yan Shi	Founder of Shared Harvest Agriculture Development Ltd; Chair of China's Community-Supported Agriculture (CSA) Network; Co-President of International CSA Network (URGECI).
10	Prof. Jules Pretty (OBE)	Director of Centre for Public and Policy Engagement at Essex University, Former Deputy-Chair of UK government's Advisory Committee, Editor of Int'l Journal of Agricultural Sustainability.
11	Prof. Oliver Morrissey	Director of Centre for Research on International Trade and Economic Development at UoN, Managing Editor of Journal of Development Studies.
12	Dr. Mark Taylor	Group leader at James Hutton Institute (JHI), and a plant molecular physiologist with extensive experience in potato research and innovation diffusion in Sub-Saharan Africa.
13	Prof. Meryem Duygun	Co-Director of the Global Centre for Banking and Financial Innovation at Nottingham University Business School (NUBS).
14	Prof. Jef Jia	Director of Sustainability and Resilience Theme at University of York Management School.
15	Dr. Jonathan Snape	Head of James Hutton Ltd (JHL), a subsidiary company of JHI responsible for managing JHI's IP Portfolio and licenced.
16	Dr. Bin Wu	Senior Research Fellow of Nottingham University Business School and PI of the project.

A strong mentoring team is an important factor attracting the participation of ECRs from China and the UK. Based upon their interests and themes of submitted papers or proposals, registered ECRs were divided into 6 groups to meet relevant mentors: normally one from China and one from the UK. The themes and mentors of ECR groups are shown in Table 11.

**Table 11 Theme and attendees of the first ECR group meeting**

	Theme	ECRs	Mentors	Date of meeting
1	Agroecology: environment-society-agriculture	7	G Qi, B Wu	18/10/2021
2	Food system: nutrition-health-consumption	8	S Fan, O Morrissey	21/10/2021
3	Eco-agriculture: technology & management	6	W Wu, M Taylor	23/10/2021
4	Digital transition: smart agriculture	6	F Nie, J Jia	19/10/2021
5	Rural transition: sociology & politics	9	P Ho, M Duygun	22/10/2021
6	Potato STB case for poverty alleviation	5	X Wang, J Snape	20/10/2021

#### 4.2.2 Methodological training for challenge-oriented and SIA perspective

The overall aim to build an innovative platform for ECRs, mentors and stakeholders may be difficult to achieve without a methodological training course for ECRs to understand and adopt two interconnected perspectives: challenge-orientation and SIA. The former is differentiated from a theoretic orientated perspective which often ignores both realistic challenges and good practices at grassroots communities in the global south. The latter is to tackle the complexity in the reality and importance of local knowledge, which is often ignored by top-down perspective. So, a methodological training course is vital for ECRs to overcome disciplinary or academic biases, and to share a value system and methodological approach featured by challenge-oriented, global-local knowledge system to design and develop their research collaboration. For this purpose, the methodological training course was designed and delivered through the following channels and mechanisms: three methodological salons, two sessions of keynote speeches, a share of ECR experiences, comments and advice from industrial mentors. Table 12 provides the details of methodological training.

**Table 12 Contents and delivery of methodological training**

No.	Title of presentation	Contributor	Type of speech	Date
1	Global challenges & stakeholder engaged research design: A case of the top 100 questions to address global agriculture in future	SL Wang	Knowledge share	15/11/2021
2	Global-local knowledge system building for local challenges: my experience in field research design and delivery	B Wu	Knowledge share	15/11/2021
3	Adjustment of research focus to reflect dynamics of ecological agriculture	Z Si	ECR experience	15/11/2021
4	Understanding geographic complexity and science-policy-practice interfaces in rural China: My field research experience	Y Zheng	ECR experience	15/11/2021
5	Rethinking empirical data: my experience in challenge-oriented research approach	Y Jin	ECR experience	15/11/2021
6	Citizen sciences for food system research in the UK	C Renolds	Knowledge share	19/11/2021
7	Planning high-quality papers to address challenges in the Global South	Y Li	Knowledge share	19/11/2021
8	China strategy on food security	H Wei	Keynote speech	8/12/2021
9	Global food system in transition: challenges & research opportunities for ECRs	S Fan	Keynote speech	8/12/2021
10	Future Food Beacon across disciplinary & campus boundaries	D Salt	Keynote speech	8/12/2021
11	UK-China collaboration for sustainable development in the global south: Overview of Newton funded projects	D Baker	Keynote speech	9/12/2021
12	Building an STB ecosystem for rural sustainability in Liangshan of Sichuan	X Wang & G Qi	Good case	9/12/2021

#### 4.2.3 Multiple stakeholders' participation and roundtable meetings

The successful completion of the GCRF Pilot project in 2020 shows the necessity and feasibility for researchers and stakeholders working together to address challenges with local solutions in poorer areas of China (see project report). The participation of multiple stakeholders is not merely beneficial to ECRs for better understanding of the challenges facing local communities, but also of the complexity and multidimensional dynamics in the global south. Equally important is the potential or direct contribution to local communities in terms of a new approach, pathway and opportunity along the line of industrialisation (standardisation, commercialisation, scaling up, an extension of value chains) and internationalisation of local characterised or high-quality products or services (e.g. rural tourism).

The mutual benefits between researchers and stakeholders can be illustrated by the establishment of partnerships between UoN, SAU, CAU, Sichuan provincial and local governments, James Hutton Ltd (the largest potato seed breeding company in the UK) and local companies in Sichuan during the implementation of the GCRF Pilot project in Sichuan. With the participation of the stakeholders, the successful field research in Liangshan Yi Ethnic Minority Prefecture, has resulted in a roadmap for the industrialisation and internationalisation of potato seed production in Liangshan in general, and policy recommendations for upgrading Butuo Potato STB to facilitate interdisciplinary research, social innovation and entrepreneurship training in particular (see Blogs).

To facilitate and support ECRs to engage with industrial stakeholders for joint research and social impact, industrial partnerships have been further developed through this Newton ECR Links project to cover different sectors (e.g. rural tourism, smart farm, ecological agriculture) and large scales (e.g. regional such as Southwest China, national or international). Through intensive communication and discussion with interested stakeholders, four roundtable meetings were organised as an important part of the joint preparation of the Workshop programme.

- Community participation for food system transition (19/11/2021): this meeting was jointly organised with a new partner, China Community-Supported Agriculture (CSA) Network with the mission to promote organic agriculture practices through return or reverse migration, entrepreneurship and participation/partnership with urban customers/groups. Currently, CSA Newton has over 1000 return/reverse entrepreneurial members. The goals of the meeting were to identify mutual interests between ECRs and the CSA members and to explore the pathway for joint research and entrepreneurship training in the future.
- Rural tourism collaboration (29/11/2021): this meeting was jointly initiated with the British Consulate General in Chongqing and UNNC to develop the partnership between ECRs and stakeholders including universities, companies, and social enterprises to promote research and industrial development through tourism for poverty alleviation, biodiversity and cultural protection across China. It has resulted in a roadmap for ECR collaboration (see Session 4.3).
- Pathways of ECR participation in Butuo Potato STB for rural revitalisation in Liangshan (1/12/2021): Based upon the roadmap of potato industrialisation and internationalisation from the GCRF pilot project (Wu, et al, 2020) and the success of the first ECR group meeting (20/10/2021), a series of meetings between individual ECRs and industrial partners were arranged by JHL to develop common interests and possible pathways for bilateral collaboration. The second group meeting led by JHL was organised for interested ECRs, including those who did not attend the first group meeting, to report on the results from their communication with industrial collaborators, and to identify pathways and interfaces among interested ECRs to engage with industrial stakeholders in the near future.
- Smart farmer innovation collaboration (6/12/2021): A partnership has been established with Agricultural Engineering Precision Innovation (Agri-EPI) Centre, a UK leading Agri-Tech Centre bridging the gap between industry and academia through its over 200 members organisations across the agri-food sector in the UK and globally. This meeting aimed to

develop common interests between ECRs and members of the Agri-EPI Centre and to explore the pathway for joint research and entrepreneurship in the smart farms.

The results and outcomes from methodological salons and roundtable meetings have been reported by ECRs to the UK-China ECR Links Workshop to gain comments and suggestions from invited panellists and the wider audience (see Annex 1).

### **4.3 CFRS: innovation platform building for ECR collaboration**

Having introduced key elements in designing and delivering the workshop project, this Section provides several roadmaps to illustrate the outcomes from this project in general, and pathways of bilateral ECR collaboration in a few of the selected areas of participation. Bearing in mind the nature of the ongoing progress in platform building, consent roadmaps for ECR cooperation across disciplinary, sector and national boundaries can be summarised through three strands: sustainable food and alternative livelihoods, innovation bases for industrial revitalisation, social innovation and entrepreneurship.

#### **1) Sustainable food and alternative livelihoods**

Global challenges in climate change, food security and rural sustainability call for a transition of food and agricultural system which involves the interconnection and coordination of technological, social, and institutional (or policy) innovations. With an emphasis on the transformation of 500 million smallholders around the globe, the SIA is vital to understand multidimensional challenges, opportunities, and good practices at the grassroot of China and the global south to find new pathways for sustainable food and agricultural transition.

A few research themes have been identified by ECRs with support from mentoring team for further development, including:

- Alternative livelihood system for sustainable rural transition in marginal zones
- Non-staple crops for sustainable food and livelihood security in marginal areas
- Classification and innovation strategy for rural revitalisation in China

#### **2) Innovation Base for Industrial Revitalisation**

Sustainable food and agricultural transition in the global south requires a reshaping of agricultural research and innovation systems to facilitate industrial revitalisation for poverty alleviation and sustainable livelihoods at local and regional levels. On reflecting on the challenges and good practices in professional participation and contribution to “targeted poverty alleviation” and rural revitalisation in different agroecological zones of China, this strand aims to shed new light on the pathways of ECRs to engage multiple stakeholders for a better understanding of the needs, dynamics, resources, and opportunities for the innovation diffusion towards scaling up, standarisation, and marketisation of local pillar products or services.

Based upon established partnerships between participatory institutions and industrial stakeholders we support, but are not be limited to, research related to the following themes:

- Potato STB (S & T Backyard) and Rural Revitalisation in Liangshan of Sichuan through partnerships between SAU, CAU, JHI, UoN, UNNC;
- Community participation in food and rural studies via the partnership with China Community-Supported Agriculture (CSA) Network for joint research and entrepreneurship training; and
- Interconnection and transformation of small farmers through dragon enterprises: A partnership with Dabeinong Group (DBN, the largest agribusiness company in China)

### 3) Social Innovation and Entrepreneurship

In the context of urbanisation, brain drains and rural decline in the global south, both human and social capital are important for the success of external participation or intervention for sustainable poverty alleviation and rural transition. While overwhelming attention is paid to top-down intervention and technological innovation, less is known about social innovation, a process of changing attitudes, perceptions, behaviours among rural people towards common interests, identities, and collaborative activities for the better usage of various resources and opportunities, internally and externally. In this regard, the national programmes of "Targeted Poverty Alleviation" and "Rural Revitalisation" in China offer rich information and good cases to develop our understanding of social innovation, entrepreneurship, and bottom-up development for better interfaces with external intervention. Along this line of thinking, two projects have been identified by ECRs, mentors and key stakeholders:

- Partnerships for rural revitalisation through tourism in China; and
- Transformation and ecological-social effect of community forestry in China.

Bringing together the above strands and proposals, a UK-China ECR Consortium of Future Rural Studies (CFRS) has been established as a key outcome from those two projects. For details of CFRS background, vision and mission, partnership and roadmaps of above project delivery, please visit CFRS' website ([here](#)).

#### 4.4 Feedback and evaluation from participatory ECRs

Following the guidance of the British Council, a feedback questionnaire was designed and disseminated to all registered ECRs just one week after the completion of the Workshop (See Annex 3 for the details). The purpose of the questionnaire were twofold: to collect information related to personal characters, academic background, preference to intercultural communication, assessment on ECR Links Workshop (questions 1-6 in Part IV), to gain their evaluation on the quality of and outcomes from this project (Questions 7 and 8 in Part IV) as well as to gauge their attitude, willingness and specific needs to participate in the proposed platform in future (Questions 1 to 3 in Part V). Bearing in mind the background of project implementation as described in Session 4.1, we have received 36 filled questionnaires and the response rate is 87.8%.

Table 13 shows the profiles of respondents which are matched with the information of registered ECRs in terms of gender and country of their institutions. Most (97%) of them fall into the age bands of between 25 to 44 years old. Furthermore, the majority (63.9%) of ECRs have a social sciences background.

**Table 13 Profiles of ECR respondents (N=36)**

Age			Gender			Country			Profession		
Item	N	%	Item	N	%	Item	No	%	Item	N	%
25-34	17	47.2	Male	20	55.6	China	21	58.3	N/E Sciences	11	30.6
35-44	18	50.0	Female	16	44.4	UK	12	33.3	S Sciences	23	63.9
45+	1	2.8	--	--	--	Other	3	8.3	Other	2	5.6

Note: N/E Science—Natural Science or Engineering; S Science—Social Sciences

From the perspective of intercultural competencies, Table 14 shows that three-quarters of respondents view international collaboration as an important part of their career development, and they express confidence in terms of ability and skills to collaborate with other people across cultural and disciplinary boundaries. Furthermore, two-thirds of respondents have confidence in the understanding of UK and China research strengths although half of the respondents had a few academic contacts or collaborations with UK counterparts before this project. The strong demand and confidence in intercultural interests and competencies are particularly important for this project aimed to build an innovation platform for ECRs to develop interdisciplinary and stakeholder-engaged research in the global south.

**Table 14 Self-score following question from 1 to 5 (1=lowest and 5=highest)**

Question	N	Score	1/2	3	4/5
1. Importance of your work collaborating with people from other countries	35	4.11	2.9	22.9	<b>74.3</b>
2. How much contact do you have with counterparts from the UK	32	<b>2.59</b>	<b>50.0</b>	25.0	25.0
3. Confidence in your ability to collaborate across cultural, disciplinary boundaries	36	3.86	8.3	22.2	<b>69.4</b>
4. How strong do you feel intercultural skills	36	4.00	2.8	22.2	<b>75.0</b>
5. Confidence in your understanding of UK/China research strengths	36	3.78	5.6	27.8	<b>66.7</b>

Table 15 illustrates the distribution of research experience in terms of the coverage of disciplines and sectors among ECRs. Typically, an ECR registered in this project has had research experience across 3 to 4 different dominations listed in Table 15. Furthermore, it is common interest or experience related to agriculture which is shared by over 70 percent of respondents, followed by climate and environmental protection (58.3%) and economics (44.4%).

**Table 15 Coverage of your research across disciplinary and sector boundaries**

Areas	No	%	Areas	No	%
Agriculture	<b>26</b>	<b>72.2</b>	Energy	8	22.2
Climate & Environ.	<b>21</b>	<b>58.3</b>	Education	6	16.7
Economics	<b>16</b>	<b>44.4</b>	Water Sanitation	5	13.9
Health	11	30.6	Humanities	3	8.3
Governance	11	30.6	Infrastructure	2	5.6
Data collection	11	30.6	Other	3	8.3
Urbanisation	9	25.0	----	--	--
Total				<b>132</b>	<b>366.7</b>

Considering the methodological training courses and the intensive activities for the preparation of this Workshop (see Section 4.1), the feedback questionnaire provided opportunities for ECRs to reflect on what they have learned from this project. The results are assembled in Table 16. Generally, respondents are satisfied with the outcomes of this project, which can be illustrated by the high scores on all items. It is noted that the top three items: new contacts, more collaboration with other people and being more open to new ideas received a high score over 4. In general, organising this Workshop received the highest score at 4.69 while 68.8 percent of respondents gave a top score of 5.

**Table 16 Assessment on the impact of this project and organisation of this event (%)**

Question	N	Mean Score	3	4	5
1. More collaboration with other people	34	<b>4.21</b>	14.7	41.2	41.2
2. Improved my research skills	34	3.71	29.4	41.2	20.6
3. Make new contacts	34	<b>4.41</b>	2.9	52.9	44.1
4. More open to new ideas	34	<b>4.09</b>	23.5	35.3	38.2
5. Prospects of career advancement	34	3.50	38.2	35.3	14.7
<b>6. Score the organisation of this Event</b>	<b>32</b>	<b>4.69</b>	<b>0</b>	<b>31.3</b>	<b>68.8</b>

Notes: for questions 1 to 5: 1=strongly disagree and 5 =strongly agree; for question 6: 1=very bad and 5 =very good.

Table 17 breaks down the organisation of the Workshop into six sessions for respondents to offer their assessment. It is noted that day one session received higher scores than day two, and respondents gave the highest scores to ECR Presentation (4.28) and keynote speech (4.21).

**Table 17 Please score the Sessions you attended by ticking box below (%)**

Session	N	Mean Score	3	4	5
1) Opening & Keynotes (1)	33	4.21	6.1	36.4	51.5
<b>2) ECR Presentations</b>	<b>32</b>	<b>4.28</b>	<b>15.6</b>	<b>25.0</b>	<b>56.3</b>
3) Group Reports & Roundtable	33	4.06	9.1	45.5	39.4
4) VIP opening address	33	3.70	12.1	30.3	42.4
5) Keynote Speeches (2)	33	3.91	9.1	30.3	48.5
6) Group reports & Roundtable	33	3.52	18.2	36.4	30.3

Note: Score: 1=very bad and 5 =very good.

It is not least important that the questionnaire survey provided a good opportunity to collect perception and evaluation of ECRs on expected outcomes from this project. Table 18 shows common and strong needs from all of the respondents to build the platform for their collaboration and run similar events and activities in the future, both of which receive over 4 scores on the average, ranked as top two. Nonetheless, partnerships with stakeholders for community engagement are also confirmed by 79 percent of respondents, ranked at third place. It is noted that the other two methodological elements: systematic approach and challenge-oriented research design, have been confirmed by over 70 percent of respondents. Bearing in mind the division of ECRs in research themes, unsurprisingly, not all of them share the same interest in three specific research fields, resulting in lower scores than the other outcomes. While near two-thirds (64.7%) of respondents highly appreciated the outcomes from food system transition, nevertheless, overlapping interests among ECRs can be found across three themes as at least half of respondents expressed their satisfaction with each item.

**Table 18 Please score your interests in key messages/outcomes of this project (%)**

Outcome	N	Mean Score	1/2	3	4/5	Rank
<b>UK-China ECR Networking</b>	<b>34</b>	<b>4.21</b>	<b>0</b>	<b>23.5</b>	<b>76.5</b>	<b>1</b>
<b>Interests to attend similar Event</b>	<b>33</b>	<b>4.15</b>	<b>0</b>	<b>9.1</b>	<b>87.9</b>	<b>2</b>
<b>Stakeholders/community engagement</b>	<b>34</b>	<b>3.94</b>	<b>5.9</b>	<b>11.8</b>	<b>79.5</b>	<b>3</b>
Systematic/interdisciplinary perspective	34	3.88	2.9	11.8	76.5	4
Challenge oriented research design	33	3.79	6.1	12.1	72.7	5
Food system transition	34	3.53	14.7	8.8	64.7	6
Rural tourism & entrepreneurship	34	3.38	20.6	5.9	61.8	7
Potato STB & ECR participation	33	3.00	21.2	12.1	51.5	8

Notes: Score: 1=very bad and 5 =very good; no figure presented for N.A. here so that the total of the distribution of scores may be less than 100 precepts.

It is worth mentioning that one in five respondents left a message to express their appreciation for the project in general, and an opportunity for joint publications and funding applications. Many offered their suggestions for building the platform. Here are some quotes from these respondents: "I hope to conduct regular observations in selected communities in different regions of China to develop social impact" (Z Wang)....."Thanks for organising this great event. I am very interested in any collaboration work (esp. writing joint academic papers and project applications)" (K Alskaf)....."The network should continue expanding its new ECR members and mentors as well." (F Azam).

## 5. Future Rural Studies: conclusion, platform and policy Implication

With a theme of building an innovation platform for UK-China ECR collaboration to contribute to sustainable food and rural transition in China and the global south, a systematic innovation approach (SIA) has been developed and applied through designing and delivering two projects: a ECR Links Workshop and Newton Fund research project. The necessity and feasibility of the SIA have been examined through combining desktop research, online survey, and delivery of the Workshop. This Chapter aims to draw a few of research findings from above projects; report on the establishment of a novel innovative platform, Consortium of Future Rural Studies (CFRS), as a foundation for ECR collaboration for rural transition and sustainability in the global south; propose a few of policy implications to relevant governments and organisations in the UK, China and beyond.

### 5.1 Conclusion and summary of research findings

With a focus on the needs, resources, and opportunities for ECRs to participate in bilateral collaboration in the near future, a number of conclusions can be drawn from research findings presented in Chapters 2 to 4.

Firstly, sustainable development goals (SDGs) in the global south have provided a sound base for the UK and China to develop long term research and innovation collaboration, in which ECR collaboration can contribute to a better understanding of local challenges in sustainable food and rural transition in China, and to share good practices with other developing countries about its targeted poverty alleviation and rural revitalisation.

Secondly, a novel methodological approach is needed to develop and apply bilateral ECR collaboration to account for the complexity in the global south and the necessity of social innovation through external intervention and professional participation. In this sense, mutual trust and cooperation between ECRs and stakeholders are vital to understand the intrinsic dynamics within rural communities, pathways of bottom-up development and interfaces with top-down intervention in China and the global south.

Thirdly, this report shows the necessity of a systematic innovation approach (SIA) to account for the voices of multiple stakeholders, identify common interests and pathways for them to work together in order to address challenging issues with constructive solutions.

Finally, this report demonstrates the feasibility of the SIA application in building an innovation platform for both university students through the GCRF pilot project highlighted in Section 2.4 and this ECR Links project through methodological training, roadmaps of group projects and feedback of registered ECRs.

### 5.2 Platform: Consortium of Future Rural Studies (CFRS)

Based upon the development and application of SIA to both GCRF pilot project and this ECR Links one, a UK-China ECR Consortium of Future Rural Studies (CFRS) has been established for ECR collaboration bilaterally (i.e. UK and China) or trilaterally (i.e. UK-China-other developing countries) for the purposes of understanding the challenges and research opportunities in the era of rural revitalisation in China; sharing good practices in sustainable food, poverty alleviation, biodiversity protection in the global south; and the transformation and empowerment of over 500 million smallholder farmers through the development of sustainable or alternative livelihood system.

This report does not intend to give a rigorous definition of Future Rural Studies (FRS) but provides an outline of FRS by listing a few of the features that are differentiated from convenient research approach. In particular, the FRS contains the following elements:

- Interconnection between global and local challenges to avoid abstract, subjective, and academic bias at the beginning of the research process. In other words, it requests a

statement through plain language to explain why the theme of the research is important for multiple stakeholders locally (outside of academia), and how it is related to common issues and knowledge gaps in the global south.

- *Links between technological system, social innovation, and policy factors* to account for the complexity and multi-dimension of research objectives before any simplification process is taken place. In other words, a more rigorous procedure is needed to ensure the participation or consultancy from multidisciplinary scholars across natural and social science boundaries.
- *Focus on empowerment and transformation of smallholder farmers* behind sustainable food, ecological/circular/digital agriculture, return/reverse migration and entrepreneurship, and community development or reconstruction.
- *Global-local knowledge system building* to include local/indigenous knowledge, ensure the voices from multiple stakeholders, develop common interests and collective decision in research theme and methodological pathways.
- *Participation of multiple stakeholders* to match with the research theme and to address local challenges, resources, and opportunities with the potential to offer constructive solutions.

For the detailed principles of FRS, resources and potential of the CFRS platform, please visit CFRS website ([here](#)).

### 5.3 Policy implications

Based upon above research findings and practices of CFRS platform building, several policy implications can be drawn for bilateral ECR collaboration in the near future.

Firstly, it calls for a joint funding programme from British and Chinese governments to support FRS for: 1) a better understanding of local challenges and good practices in the global south; 2) developing theoretic ground and methodological approach of FRS to fill knowledge gaps in development studies; and 3) conducting international comparison in sustainable food, poverty alleviation and rural transition in the context of urbanisation and marginalisation. It can be started from initial funding for a few pilot projects outlined in Section 4.3 or an international conference to discuss the necessity, feasibility, and roadmap for the funding programme which may be interfaced with the bilateral and trilateral programmes with the relevant themes (e.g. sustainable food and livelihoods, social innovation and entrepreneurship).

Secondly, it recommends establishing a few FRS Hubs in some of global universities, both in the UK and China, with the missions to: 1) facilitate ECR collaboration across disciplinary, faculty, sector and national boundaries to address some common challenges facing local communities in the global south; 2) develop the SIA approach and toolkits for multiple stakeholders' participation, joint research design, data collection and analysis, decision making and project evaluation; 3) apply the SIA approach and good cases into pedagogical reform and curricular development for both domestic and international students for better understanding of challenges and opportunities in the global south, developing their competencies and contributing to the SDGs.

Thirdly, reflecting on the strong demand from multiple stakeholders for the participation in bilateral research and innovation collaboration (described in Chapter 3) and the initial experience of CFRS innovation bases ([here](#)), it is recommended to establish a few bilateral FRS Bases in both countries for ECRs to work together with multiple stakeholders for joint research design and field research, experiment and demonstration, entrepreneurship education and training.

Finally, given the fact that both the UK and the Chinese governments share interests, commitment, and responsibility to promote SDGs in the global south, it is suggested to adjust relevant overseas scholarship schemes by adding FRS elements. For the Rural Revitalisation Programme funded Chinese Scholarship Council, for instance, it is suggested to initiate a pilot project through the participation of FRS Hub universities from both the UK and China for joint design and implementation of visiting scholarship programme. For the implementation of the UK's

Chevening Programme in China, the FRS can be added into its recruitment programme to encourage and attract Chinese talent to join this domain.

### [End of the report]

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## Annex 1: Programme of UK-China ECR Links Workshop

(8-9/12/2021)

UK-China Early Career Researcher Links Workshop

中英青年学者合作网络研讨会

### Systematic Innovation for Food Security and Rural Sustainability in China 中国食物安全保障和农村可持续发展的系统创新

Online International Workshop 线上国际研讨会

**09:00 – 12:00 (GMT) 8 – 9 December 2021**

**(Microsoft Teams, 微软 Teams)**

**2021 年 12 月 8 至 9 日每晚 17:00 至 20:00 (北京时间)**



Nottingham University  
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RURAL DEVELOPMENT INSTITUTE CHINESE ACADEMY OF SOCIAL SCIENCES

## Background 会议背景

Global challenges in rural poverty, food security, climate change call for international research collaboration in sustainable agriculture and rural transformation. A UK and Chinese early career researcher (ECR) Links Workshop is jointly funded by the Newton Fund and Natural Science Foundation of China (Newton-NSFC) with aims to establish a network for researchers from two countries to develop interdisciplinary and stakeholder engaged research collaboration to address challenges and opportunities related to ecological agriculture, food system and rural transition. With the support from internationally renowned scholars and industrial leaders, 41 ECRs from 30 research institutions (universities) across natural and social sciences have been gathered online for sharing their experience and research findings and developing common interests and roadmaps in collaborative research and engagement with industrial stakeholders.

This workshop is jointly organised by Nottingham University Business School and Rural Development Institute of Chinese Academy of Social Sciences (RDI of CASS), in partnership with James Hutton Institute (JHI) and Centre for International Agricultural Research of the Chinese Academy of Agricultural Sciences (CIAR of CAAS). It is supported by China Agricultural University (CAU), University of Nottingham Ningbo China (UNNC), Agricultural Engineering Precision Innovation (Agri-EPI) Centre, China Britain Regional Initiative (CBRI) and Asia Business Centre of University of Nottingham (ABC).

应对全球农村贫困、食物安全、气候变化等挑战性问题，需要强化在可持续农业和乡村转型方面的国际研究合作。中英青年学者合作网络项目由英国牛顿基金及中国国家自然科学基金委员会联合资助，旨在为中英两国青年学者搭建交流合作平台，推进跨学科及利益相关者参与的研究合作，在生态农业、食物系统、乡村转型等领域，共同应对挑战、抓住机遇。在多名国际知名学者及企业家的指导下，来自中英等国 30 所研究机构及院校的 41 名多学科（自然科学和社会科学）青年学者，通过线上会议方式，分享了跨学科研究的经历和成果，并就合作研究的兴趣点及其同中英两国农业领域产学研合作路径展开了建设性的研讨。本次线上国际会议由英国诺丁汉大学商学院（Nottingham University Business School）和中国社会科学院农村发展研究所（RDI CASS）联合主办，协办单位为英国詹姆斯·赫顿研究院（JHI）、中国农业科学院海外农业研究中心（CIAR CAAS）；支持单位为中国农业大学（CAU）、宁波诺丁汉大学（UNNC）、英国精准农业工程创新中心（Agri-EPI）、中英区域协会（CBRI）及诺丁汉大学亚洲商务中心（ABC）。

## Aims/Objectives 会议目标

1. Facilitate academic exchange along the line of challenge-oriented and systematic perspective researches for food security and rural sustainability in China and global south 在中国及第三世界国家食物安全、农村可持续发展领域，围绕挑战性问题，就如何发展系统思考与研究方法论创新，进行学术交流和分享。
2. Share research findings, methodological innovation and resources for interdisciplinary research collaboration among ECRs between UK and China 中英两国青年学者分享学术研究发现、方法论探索、跨学科合作研究资源
3. Identify opportunities and pathways for research and innovation collaboration between ECRs and industrial stakeholders from two countries in agriculture and rural development. 探讨中英两国青年学者同利益相关者在农业及农村领域开展合作研究及创新的机会及路径

## Expected Outcomes 会议成果

1. Three ECR Collaboration Groups in social innovation, food system transition, sustainable agriculture 形成中英青年学者合作研究网络：社会创新、食物系统转型及可持续农业
2. Industrial links for ECR engagement in smart farm, community-supported agriculture, rural tourism 中英青年学者参与产业合作：智慧农场、社区支持农业及乡村旅游
3. Showcases of challenge-oriented, interdisciplinary, stakeholder engaged research design and delivery

挑战性问题导向的、利益相关者参与的跨学科研究案例展示

4. A number of high-quality publications to address local challenges and good practices in global south 数篇高质量文章聚焦于第三世界国家挑战问题及其成功经验
5. Roadmaps and partnerships for UK-China collaboration in smart agriculture, potato industrialisation, rural tourism 在智慧农业、马铃薯产业化、乡村旅游等领域, 发展中英合作的路线图
6. A research report with policy recommendations for UK-China agricultural/rural research & innovation collaboration 发表关于中英农业/农村领域合作研究及创新方面的调研报告, 提出政策建议

#### **Who May Benefit from this Event? 谁应参加?**

- Young researchers and doctoral students who are interested in systematic thinking and innovation for food system transition, rural innovation and sustainability, challenge-oriented and stakeholder engaged research 在以下领域对系统性思考及创新感兴趣的青年学者及博士生: 食物系统转型、乡村创新及可持续发展、挑战性问题导向的及利益相关者参与的研究
- Representatives from government agencies, industrial companies, farmers or community-support organisations who are interested in the UK-China collaboration in agricultural/rural research and innovation 对中英两国在农业及农村领域发展研究创新开展合作感兴趣的政府部门、业界公司、农民组织、社区支持组织

## Agenda 日程安排

### Day 1 (Wed 8 December) Systematic Methodology for Food / Rural Studies

第一天 (12月 08 日星期三) 食物系统与农村研究的系统方法论

Section 1 Opening Remarks & Keynote Speeches (1) 开幕致辞及主旨发言,	
Chair: Professor Patrick Chau, Vice-Provost, UNNC 主持人: Patrick Chau 教授, 宁波诺丁汉大学副校长	
09:00-09:20 GMT 17:00-17:20 CST	Welcome, China strategy on food security Professor Houkai Wei, Director, Rural Development Institute (RDI), CASS 欢迎致辞, 中国的粮食安全战略, 魏后凯教授, 中国社会科学院农村发展研究所所长
09:20-09:40 GMT 17:20-17:40 CST	Global food system in transition: Challenges & research opportunities for ECRs Professor Shenggen Fan, Dean, Academy of Global Food Economics and Policies, CAU 全球食物系统转型: 挑战及青年学者的研究机遇, 樊胜根教授, 中国农业大学全球食物经济与政策研究院院长
09:40-10:00 GMT 17:40-18:00 CST	Future Food Beacon across disciplinary and campus boundaries Professor David Salt, Director, Future Food Beacon, University of Nottingham University of Nottingham 跨学科、跨校园的未来食品研究卓越灯塔项目 David Salt 教授, 英国诺丁汉大学未来食品研究卓越灯塔项目主任
Section 2 ECR's Research Findings and Methodological Exploration	
Chair: Professor Fengjing Nie, Deputy Director, Centre for International Agriculture Research of CAAS 青年学者的研究发现与方法论探索, 主持人: 聂凤英教授, 中国农业科学院海外农业研究中心副主任	
10:00-10:10 GMT 18:00-18:10 CST	Citizen sciences for food system research in the UK & China 中英食物系统研究中的社区参与, Dr Christian Reynolds, City University of London (伦敦城市大学)
10:10-11:00 GMT 18:10-19:00 CST	<i>Network analysis of food-water-economy nexus for supporting robust agriculture,</i> Lirong Liu, Surrey University <i>Sustainable development of onshore aquaculture in China and its offshore environmental impacts,</i> Xun Yu, Sun Yat-sen University <i>Co-operative waste management and valorisation for circular agriculture</i> Victoria Outram, University of Nottingham <i>Non staple food crops development in China,</i> Wenjin Long, China Agricultural University <i>Alternative livelihoods in BRI countries: Chinese agricultural investment in Lao</i> Yan Jin, Yunnan Agriculture University <i>From socialist cooperation to joint research: The historical transitions of seed breeding in China,</i> Siyuan Xu, Northwest Agricultural & Forestry University <i>Knowledge exchange and science-policy-practice interfaces</i> Weikai Wang and Ying Zheng, Glasgow University <i>Cross-cultural exploration of consumer opinions on food sustainability,</i> Qian Yang, UoN <i>Impact of reducing food loss on food consumption inequality,</i> Xin Yang, CASS
Section 3 ECR Group Reflections and Roundtable Discussion with Panellists	
Chair: Professor Oliver Morrissey, University of Nottingham, CI of the project 青年学者分组报告及圆桌会议讨论, 主持人: Oliver Morrissey 教授, 诺丁汉大学, 本项目联合申请人	

Group Report 分组报告 11:05-11:20 GMT 19:05-19:20 CST	1 Challenge-oriented research & fieldwork 问题导向的研究设计(Weikai Wang) 2 Citizen sciences for food system studies 食物系统研究的社区参与(Shuru Zhong) 3 Publications to address challenges 围绕挑战性问题撰写学术文章 (Punita Bhatt)
Roundtable Discussion 圆桌会议讨论  11:20-11:55 GMT 19:20-19:55 CST	Why is challenge-oriented research important for rural studies in global south 为什么挑战性问题导向的学术研究对第三世界国家农村发展具有重要意义? How can systematic perspective contribute to food security/rural sustainability 系统性思考如何贡献于食物安全和农村可持续发展? By what mechanism can ECR links be developed and enhanced 通过何种方式或机制 有助于发展和加强中英两国青年学者间的合作研究网络? <b>Panellists</b> 讨论成员 Professor Mark Talyor, James Hutton Institute 英国詹姆斯·赫顿研究院研究员 Professor Songliang Wang, Fujian Agri & Forestry University 福建农林大学王松良教授 Professor Meryem Duygun, NUBS 诺丁汉大学商学院教授 Mr Jason Feehily, Knowledge Exchange Asia, UoN 诺丁汉大学亚洲知识交流中心主任杰森·菲利先生,
11:55-12:00 GMT	Concluding remarks by Bin Wu, PI of the project 会议总结, 武斌博士, 项目主持人

## Day 2 (Thu 9 December ) UK-China Collaboration in Agri & Rural Development

第二天 (12月 09 日星期四) 中英农业及乡村发展合作

### Section 4 Opening Ceremony and VIP address: Global Challenges & Policy Responses:

Chair: Professor Tongquan Sun, Co-PI of the project, Research Fellow of the RDI of CASS

国际会议开幕式及 VIP 致辞 主持人: 孙同全教授, 中国社科院农发所研究员, 本项目联合主持人

09:00-09:40 GMT 17:00-17:40 CST  5 minutes for each speaker 每人 5 分钟	Scene setting and summary from Day 1 背景简介及第一天会议总结 Dr Bin Wu, PI of the project 武斌博士, 本项目主持人 <b>Opening Address</b> 开幕致辞 Professor Zoe Wilson, Pro-Vice Chancellor for Faculty of Science, University of Nottingham 佐伊·威尔逊教授, 诺丁汉大学科学学部副校长 Mr Tim Standbrook, Deputy Consul General, British Consulate General Chongqing 施博荣先生, 英国驻重庆总领事馆副总领事 Professor Colin Campbell, CEO of James Hutton Institute 柯林·坎贝尔教授, 英国詹姆斯·赫顿农业科学院总裁 Professor Xiaoyun Li, China Agricultural University 中国农业大学李小云教授, Professor Martin Lockett, NUBS China 马丁·洛克特教授, 宁波诺丁汉大学商学院院长 Professor Peter Ho, Zhejiang University 何佩生教授, 浙江大学公共管理学院教授 Professor Yu Xiong, Associate Dean of International, Surrey University 熊榆教授, 英国萨里大学助理副校长(国际化)
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### Section 5 Keynote Speeches (2)

Chair: Professor Simon Mosey, Director, HGI for Innovation & Entrepreneurship, University of Nottingham  
主旨发言及研究报告, 主持人: Simon Mosey 教授, 诺丁汉大学海顿·格林创新创业中心主任

09:40-10:00 GMT 17:40-18:00 CST	Key point of poverty reduction in China: Capital intensive mechanism and its real experience, 中国脱贫的重资产投入机制及其影响, Professor Tiejun Wen, Renmin University 温铁军教授, 中国人民大学
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10:00-10:20 GMT 18:00-18:20 CST	UK-China collaboration for sustainable development in global south: Overview of Newton funded projects 中英两国在第三世界国家可持续发展领域的合作前景：牛顿项目概述, Mr Richard Baker, Newton Fund Strategic Manager (牛顿项目总负责人)
10:20-10:40 GMT 18:20-18:40 CST	Experience & prospect to UK-China agricultural innovation collaboration 中英农业创新合作：经验及展望, Professor Dave Ross, Agri-EPI (英国精准农业工程中心总裁)
10:40-11:00 GMT 18:40-19:00 CST	Building a STB ecosystem for rural sustainability in Liangshan, Sichuan Professor Xiyao Wang (SAU) & Professor Gubo Qi (CAU) 四川凉山农村可持续发展与科技小院生态系统的建设, 王西瑶教授(四川农业大学), 齐顾波教授(中国农业大学)
<b>Section 6 Roadmaps for UK-China Collaboration: ECR Reports &amp; Roundtable Discussion</b>	
<b>中英合作路线图：青年学者分组报告及圆桌会议讨论</b>	
Chairs (主持人):	
Dr Robert Wapshott, Associate Dean of Nottingham University Business School 诺丁汉大学商学院副院长 Ms Min Rose, Deputy Director of RKE, UNNC 何敏女士, 宁波诺丁汉大学研究与知识交流中心副主任	
Group report 分组报告 11:00-11:15 GMT 19:00-19:15 CST	1 ECRs engagement with Potato STB 青年学者参与马铃薯科技小院 (Qian Yang) 2 Platform for UK-China rural tourism research 中英乡村旅游研究合作平台 (FS Azam) 3 Bilateral collaboration in digitalisation 中英智慧农业/乡村合作路线图 (T Holloway)
Roundtable Discussion 圆桌会议讨论 11:15-11:55 GMT 19:15-19:55 CST	What are resources & opportunities for the bilateral collaboration 双边合作的资源及机遇有哪些? By what mechanisms can ECRs participate & contribute to it 青年学者通过何种机制如何参与、贡献? How can ECRs & stakeholders work together in the near future 青年学者同利益相关者近期如何开展合作? <b>Panelists</b> 讨论成员 Professor Xiuli Xu, Dean of CIDGA, China Agricultural University 徐秀丽教授, 中国农业大学国际发展与全球农业学院院长 Dr Hannah Noke, HGI, Nottingham University Business School 诺丁汉大学商学院海顿·格林创新创业中心副主任 Dr Jonathan Snape, Head of JHL 英国詹姆斯·赫顿公司总经理 Ms Lisa William, Agri-EPI Centre 英国精准农业工程中心经理 Ms Xiaomei Liu, Yunhe Centre 刘晓梅女士, 丹巴登龙云合森林学校执行校长
11:55-12:00 GMT 19:55-20:00 CST	Concluding remarks by Bin Wu, PI of this project 会议总结致辞: 武斌博士, 本项目主持人

## Annex 2: Questionnaire for industrial participation in UK-China agriculture and rural Innovation Collaboration

In the context of sustainable development goals, climate change and various uncertainties at globe, this project aims to identify needs, resources and opportunities for UK and China's innovation collaboration in sustainable agriculture and rural revitalisation. With a support from the UK government, this project is designed to collect information from interested organisations, industrial enterprises, investment and trade firms, research and innovation institutions, farmers' associations, etc. about their needs and preferences in participation. The analysis of survey data will result in policy recommendations to government agencies and relevant stakeholders for improving and enhancing bilateral collaboration. This is a voluntary based and anonymous survey for academic research only. The results will be published as a research report in a scheduled UK-China Academia Links Workshop this December and online available afterwards. We appreciate for your support by spending 10 minutes on questionnaire, and disseminating it to those who may be interested in participation.

Dr. Bin Wu, Senior Research Fellow of NUBS and PI of this Project

### 1 Nature of your company/organisation (single):

- |                                                               |                                                                 |
|---------------------------------------------------------------|-----------------------------------------------------------------|
| <input type="checkbox"/> 1. Industrial/commercial company     | <input type="checkbox"/> 2. Non-profit consultancy service firm |
| <input type="checkbox"/> 3. Research and Innovation Institute | <input type="checkbox"/> 4. Government agency                   |
| <input type="checkbox"/> 5. Membership organisation           | <input type="checkbox"/> 6. NGO and rural support group         |
| <input type="checkbox"/> 7. Others (Please specific): _____   |                                                                 |

### 2 Areas of your company/organisation specialised (multiple)

- |                                                                                                                           |  |
|---------------------------------------------------------------------------------------------------------------------------|--|
| <input type="checkbox"/> 1. Development of new production/management technologies (methods, software, know-how)           |  |
| <input type="checkbox"/> 2. Directly application or dissemination of new/matured technologies widely                      |  |
| <input type="checkbox"/> 3. Support production/technology/product (or service) design, promotion, branding, etc.          |  |
| <input type="checkbox"/> 4. Investment, trade, service provision                                                          |  |
| <input type="checkbox"/> 5. Policy advice, civil service, public support to sustainable agriculture and rural development |  |
| <input type="checkbox"/> 6. Voluntary service and support to rural producers or vulnerable groups                         |  |
| <input type="checkbox"/> 7. Entrepreneurship or leadership training, internship, career development advice                |  |
| <input type="checkbox"/> 8. Others (Please specific): _____                                                               |  |

### 3 Sector of your company/organisation involved (Multiple)

- |                                                                                   |                                                                  |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------|
| <input type="checkbox"/> 1. Cropping (including seed breeding)                    | <input type="checkbox"/> 2. Animal husbandry                     |
| <input type="checkbox"/> 3. Food processing                                       | <input type="checkbox"/> 4. Information system                   |
| <input type="checkbox"/> 5. Rural services ( tourism, logistics, banking, credit) | <input type="checkbox"/> 6. Environment protection               |
| <input type="checkbox"/> 7. Welfare and social protection                         | <input type="checkbox"/> 8. Farmer's organisation (cooperatives) |
| <input type="checkbox"/> 9. Others (Please specific): _____                       |                                                                  |

### 4 Statue of your company/organisation (Single)

- |                                       |                                    |                                                      |                                    |                                        |                                    |
|---------------------------------------|------------------------------------|------------------------------------------------------|------------------------------------|----------------------------------------|------------------------------------|
| Establishment (years):                | <input type="checkbox"/> <3        | <input type="checkbox"/> 3-10                        | <input type="checkbox"/> 11-20     | <input type="checkbox"/> >20           |                                    |
| Staff (persons):                      | <input type="checkbox"/> <10       | <input type="checkbox"/> 10-30                       | <input type="checkbox"/> 31-100    | <input type="checkbox"/> >100          |                                    |
| Location: UK                          | <input type="checkbox"/> Scotland  | <input type="checkbox"/> North (Northwest Yorkshire) | <input type="checkbox"/> Midland   |                                        |                                    |
|                                       | <input type="checkbox"/> South     | <input type="checkbox"/> Wales                       | <input type="checkbox"/> N Ireland |                                        |                                    |
| China                                 | <input type="checkbox"/> Northwest | <input type="checkbox"/> North                       | <input type="checkbox"/> Centre    | <input type="checkbox"/> Southeast     | <input type="checkbox"/> Southwest |
| Scope of the business:                |                                    | <input type="checkbox"/> Local                       | <input type="checkbox"/> National  | <input type="checkbox"/> International |                                    |
| Percentage of international business: | <input type="checkbox"/> <30%      | <input type="checkbox"/> 30%-60%                     | <input type="checkbox"/> >60%      |                                        |                                    |
| Experience in UK-China collaboration: | <input type="checkbox"/> None      | <input type="checkbox"/> Beginning                   | <input type="checkbox"/> Growth    | <input type="checkbox"/> stagnation    | <input type="checkbox"/> Decline   |

### 5 Motivation for UK-China collaboration (Multiple)

- |                                                    |                                                 |
|----------------------------------------------------|-------------------------------------------------|
| <input type="checkbox"/> 1. Research & development | <input type="checkbox"/> 2. Technology transfer |
|----------------------------------------------------|-------------------------------------------------|

3. Import/export  
 5. New market opportunity  
 7. Environment/climate change  
 9. Others (Please specific): \_\_\_\_\_
4. Investment/joint venue  
 6. Internationalisation of products/services  
 8. Sustainable development goals

#### 6 Specific needs from the UK-China collaboration (Multiple)

1. Advanced technology  
 3. Consultancy services  
 5. Market brand to promote local products/services  
 7. Entrepreneurship/leadership education/training  
 9. Others (Please specific): \_\_\_\_\_
2. Higher standards of production and management  
 4. Access to overseas market for products/services  
 6. Talents/experts for development  
 8. Investment or joint venture

#### 7 Specific support needed for the UK-China collaboration (Multiple)

1. Information for relevant technology, market, enterprises, policies  
 2. Opportunities to meet suitable partners for collaborative opportunities  
 3. Opportunities to attend relevant industrial associations for regular meeting and information  
 4. Joint research to explore the opportunities/feasibility in overseas market  
 5. Joint research for technology innovation, product/service design, market networking  
 6. Joint entrepreneurship/leadership training, internship, people exchange programme  
 7. Joint application for government research, innovation funding sources  
 8. Joint application for industrial funding sources  
 9. Others (Please specific): \_\_\_\_\_

#### 8 Pathways to initiate/participate relevant actions in the short terms

Item Interest	No interest	A little	Interest	Strong interest	No comment
Online meeting with relevant researchers for joint research	<input type="checkbox"/>				
Online meeting with relevant counterparts for collaboration	<input type="checkbox"/>				
Online meeting with research institutions for partnerships	<input type="checkbox"/>				
Online Workshop for UK-China collaboration 9/12/2021	<input type="checkbox"/>				

#### 9 If you select "interest" above, feel free to provide information below for further contact later

1. Full name of organisation: \_\_\_\_\_
2. Website (if applicable) or Brochure (English or Chinese): \_\_\_\_\_
3. Contact person's name, email and phone (if applicable): \_\_\_\_\_

#### 10 Should you have any comments or suggestions, please write down below.

MANY Thanks FOR YOUR PARTICIPATION!

# 中英农业农村创新合作——产业参与意向咨询

在可持续发展目标、气候变化及多种不确定性的全球大背景下，本项目受英国政府资助，旨在发现中英两国在可持续农业、乡村振兴领域开展创新合作的需求、资源和机会，了解相关企事业单位、研究创新机构、投资贸易公司、农民组织等的参与意向，并以此为依据进行学术分析、形成政策建议，供政府相关部门、行业组织和对发展中英农业创新合作的企业家和研究机构参考，共同努力推进双边合作。

本着自愿、匿名的原则，我们诚邀贵单位填写本问卷（不超过 10 分钟），并帮助散发本项目信息至其他有意向参与的单位或个人。本项目成果将会在 2021 年 12 月 9 日举办的中英农业合作的线会议上发布，正式研究报告也将会在互联网上发表。非常感谢贵单位在百忙中参与、支持！

武斌博士（诺丁汉大学商学院高级研究员、本项目主持人）

## 1 贵单位性质（单选）

- 1. 企业、商业公司
- 2. 非营利性咨询服务公司
- 3. 研究院所、创新机构
- 4. 政府部门
- 5. 会员组织
- 6. 非政府组织、助农社团
- 7. 其他（请说明）\_\_\_\_\_

## 2 贵单位业务类型（多选）

- 1. 开发新型产品/管理技术（方法、软件、技能）
- 2. 新技术的推广应用
- 3. 协助生产/技术/产品（或服务）的设计、推广、品牌建设等
- 4. 农业投资、贸易、服务
- 5. 为农业/农村发展提供政策建议、支持服务
- 6. 为农业生产者或弱势群体提供志愿服务
- 7. 为创业者或领导人提供培训、实习、职业发展辅导
- 8. 其他（请说明）\_\_\_\_\_

## 3 贵单位业务领域（多选）

- 1. 种植（含育种）
- 2. 畜牧业
- 3. 食品加工
- 4. 信息系统
- 5. 农村服务业（含旅游、物流、银行、信用）
- 6. 生态环境保护
- 7. 农村福利、社保
- 8. 农民组织（合作社、协会）
- 9. 其他（请说明）\_\_\_\_\_

## 4 贵单位基本情况（单选）

成立时间	<input type="checkbox"/> <3 年	<input type="checkbox"/> 3-10 年	<input type="checkbox"/> 11-20 年	<input type="checkbox"/> >20 年
职工数量	<input type="checkbox"/> <10 人	<input type="checkbox"/> 10-30 人	<input type="checkbox"/> 31-100 人	<input type="checkbox"/> >100 人
所属区域	英国	<input type="checkbox"/> 苏格兰	<input type="checkbox"/> 英格兰北部（西北、约克郡）	<input type="checkbox"/> 英格兰中部
		<input type="checkbox"/> 英格兰南部	<input type="checkbox"/> 威尔士	<input type="checkbox"/> 北爱尔兰
经营区域	中国	<input type="checkbox"/> 西北	<input type="checkbox"/> 北方	<input type="checkbox"/> 中部
			<input type="checkbox"/> 区域	<input type="checkbox"/> 全国
国际业务占比		<input type="checkbox"/> <30%	<input type="checkbox"/> 30%-60%	<input type="checkbox"/> >60%
中英合作经验		<input type="checkbox"/> 无	<input type="checkbox"/> 起步	<input type="checkbox"/> 增长
				<input type="checkbox"/> 停滞
				<input type="checkbox"/> 下滑

**5 贵单位参与中英合作的理由 (多选)**

1. 新技术研发       2. 技术转化  
 3. 进出口业务       4. 投资/合资  
 5. 国际市场机会       6. 产品/服务国际化  
 7. 环境/气候变化       8. 联合国可持续发展目标  
 9. 其他 (请说明) \_\_\_\_\_

**6 贵单位开展中英合作的需求 (多选)**

1. 学习引进先进技术       2. 提高产品、服务、管理标准  
 3. 拓展咨询服务业务       4. 为本土产品/服务拓展海外市场  
 5. 发展市场品牌       6. 吸引相关的专家、人才  
 7. 发展创新创业、管理人才培训       8. 投资/合资机会  
 9. 其他 (请说明) \_\_\_\_\_

**7 贵单位在开展中英合作方面所亟需的帮助是什么? (多选)**

1. 相关技术、市场、企业、政策的信息       2. 有机会结识商业伙伴、探讨合作可能性  
 3. 加入相关行业网络, 参加会议、了解信息       4. 合作研究/探索海外市场机会、可行性  
 5. 在新技术、产品/服务、市场方面开展研究合作  
 6. 在创新创业培训、实习生、人员交流等方面开展合作  
 7. 联合申请研究、创新领域的政府资助项目  
 9. 其他 (请说明) \_\_\_\_\_

8. 联合申请非政府或产业、行业资助项目

**8 贵单位近期是否有意向参与以下活动**

活动	意向	不感兴趣	略感兴趣	感兴趣	很感兴趣	不便评论
与中英相关领域的学者进行线上会议, 发展合作兴趣	<input type="checkbox"/>					
与中英相关同行进行线上会议, 探索合作路径	<input type="checkbox"/>					
与中英相关研究机构进行线上会议, 探索合作项目	<input type="checkbox"/>					
2021 年 12 月 9 日中英合作研讨会 (线上)	<input type="checkbox"/>					

**9 如贵单位有意向, 敬请提供以下信息, 以便我们与贵单位联系跟进**

1. 贵单位全称 \_\_\_\_\_  
2. 贵单位网站或宣传册 (中英文均可) \_\_\_\_\_  
3. 贵单位联系人姓名、电子邮件和电话 \_\_\_\_\_

**10 如有其它意见、建议, 欢迎填入下面空白处**

**感谢参与!!**

## Annex 3: Q'aire for ECR evaluation on UK-China Link project

Dear all, I am grateful for your participation and contribution, leading to successful Workshop (8-9/12). Following the guideline of the funder, all of ECRs are requested to fill this questionnaire. Your cooperation and prompt response are highly appreciated. Dr. Bin Wu, PI of this Project

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### PART I: About you and your work

First name: .....

Last name: .....

Age group:  20-24

25-34

35-44

45+

Your gender:  Male

Female

Your main country of residence/work:

China  UK  Other

Your professional field:

Nature sciences  Engineering  Social Sciences  Humanities  Other

**Please score your answer to the following questions from 1 to 5 (where 1 = lowest and 5 = highest).**

1. How important to you & your work is collaborating with people from other countries/ cultures?\_\_\_\_\_

2. How much contact do you currently have with counterparts from the UK and across the world?

a. Contact with UK\_\_\_\_\_; b. Contact with other countries:\_\_\_\_\_

3. How confident are you in your ability to collaborate actively with people from different countries, cultures, sectors and disciplines?\_\_\_\_\_

4. How strong do you feel your intercultural skills are? (i.e. your ability to understand, relate to, communicate fully with, and work effectively with people from cultures other than your own)\_\_\_\_\_

5. How confident are you in your understanding of UK/China's research strengths?\_\_\_\_\_

### PART II: Your research

1. Does your research deal with development issues? Yes  No

2. If yes, please circle the area(s) that your research relates to.

Agriculture  Climate & Env.  Energy  Education  Economics  
 Health  Water & Sanita.  Urbanisation  Infrastructure  Humanities  
 Governance  Data collection  Other (please specify) .....

### PART III: About the UK (only applicable to researchers from China)

**Please score your answer to the following questions from 1 to 5 (where 1 = strongly disagree and 5 = strongly agree).**

1. The UK is a leading player in the field of research and innovation:\_\_\_\_\_

2. My research can benefit through collaboration with UK researchers:\_\_\_\_\_

#### **PART IV: This Workshop**

*Please score your answer to the following questions from 1 to 5 (where 1 = strongly disagree and 5 = strongly agree).*

1. Taking part in this event has made me more interested in collaborating with people with backgrounds different from my own: \_\_\_\_\_
2. This event has improved my research skills: \_\_\_\_\_
3. This event allowed me to make new contact(s) that will be useful to me in the future: \_\_\_\_\_
4. This event has made me more open to new ideas: \_\_\_\_\_
5. This event has improved my prospects of career advancement: \_\_\_\_\_
6. Please score the organisation of this event from 1 to 5 (1 = very bad and 5 = very good): \_\_\_\_\_

7 Please score the Sessions you attended by ticking box below

Session	1	2	3	4	5	N.A.
1) Opening & Keynotes (1)	<input type="checkbox"/>					
2) ECR Presentations	<input type="checkbox"/>					
3) Group Reports & Roundtable	<input type="checkbox"/>					
4) Opening & VIP address	<input type="checkbox"/>					
5) Keynote Speeches (2)	<input type="checkbox"/>					
6) Group reports & Roundtable	<input type="checkbox"/>					

8 Please score your interests in key messages/outcomes of this Workshop

Key message or outcome	1	2	3	4	5	N.A.
1) Challenge oriented research design	<input type="checkbox"/>					
2) Systematic/interdisciplinary perspective	<input type="checkbox"/>					
3) Stakeholders/community engagement	<input type="checkbox"/>					
4) UK-China ECR Networking	<input type="checkbox"/>					
5) Food system transition	<input type="checkbox"/>					
6) Potato STB & ECR participation	<input type="checkbox"/>					
7) Rural tourism & entrepreneurship	<input type="checkbox"/>					
8) Interests to attend similar Event	<input type="checkbox"/>					

#### **PART V: Follow-up action and your comments/suggestion**

1. Are you interested to become a member of UK-China Food and Rural Research Consortium (tentative title)?  
Yes  No
2. If yes, which group below are you interested to join? Food system  Potato base  Community empowerment  All of them  Other (specific): \_\_\_\_\_
3. What action do you want to follow-up in short term? Joint academic paper  project blog  funding application  stakeholder engagement  Other (specific): \_\_\_\_\_
4. Please feel free to write your comments or suggestions below: