# 2023 Youth Hackathon for Green Low-Carbon Agriculture

*"New Technology, New Pattern, New Service"*

## I.  *About 2023 Youth Hackathon*

### (i)  Background

The current global population is persistently increasing, with an estimated projection of 9.7 billion by 2050. This necessitates the production of more food and other agricultural products on limited land and water resources, which, therefore, poses significant challenges to agricultural production and resource management. Additionally, climate change has had a profound impact on global agriculture. Countries around the world are actively seeking ways to reduce carbon emissions and promote green low-carbon development.

The United Nations Sustainable Development Goals (SDGs) outline 17 specific goals, including "Zero Hunger", "Quality Education", "Clean Water and Sanitation", and "Climate Action" which closely related to agricultural and rural development. Actions have been taken by governments and institutions around the world to strengthen investment and support for agriculture industry and rural areas, encouraging innovatively green low-carbon agricultural development in response to these goals.

Green low-carbon agriculture seeks to achieve agricultural and rural carbon emissions reduction and carbon sequestration, together with sustainable development in both the agriculture industry and rural areas. To this end, techniques such as improving agricultural production efficiency, optimizing resource utilization, reducing emissions and pollution, and promoting ecosystem protection and restoration should be utilized. Currently, given that the level of agricultural development varies among different countries, which is caused by distinctions in multiple aspects, including

productivity, population, resources and mindset of labors and consumers, achieving green low-carbon agricultural production has become a global challenge that urgently requires countries to strengthen cooperation to support the dual carbon goals, promoting high-quality development of agriculture and rural areas through green and low-carbon means, and exploring the formation of country-specific strategies for agricultural green development.

**(ii)    What is a Hackathon?**

Hackathon is an innovative event where teams of creativity and expertise explore solutions for specific issues and challenges in a collaborative environment. Typically, a hackathon lasts for several days, and possible outcomes include ICT tools, software, apps, sustainable products, business models, or other solutions, which may lead to the inception of a start-up business or project. With the assembly of people from all walks of life who do not normally work together, this environment comprising of hackers can explore solutions both practically and innovatively to address food and agricultural problems.

This 2023 Youth Hackathon for Green Low-Carbon Agriculture aims to evoke the creativity and problem-solving nature of young people to provide solutions for global agricultural green development, as well as agricultural carbon emissions reduction and carbon sequestration by adopting innovative and inclusive methods with the sense of "New Technology, New Pattern, and New Service".

**Key Initiatives Include:**

- Conduct cooperation with stakeholders, industry professionals, and experts to establish a global network of relationships related to the entire green low-carbon agricultural value chain, and explore innovative opportunities and create a favorable environment by working in collaboration with both public and private sectors.

- Share cutting-edge information, theoretical achievements, and best-case examples related to technologies, innovations, and business models in the field of emission reduction and carbon sequestration in agriculture.

- Through the efforts of the Food and Agriculture Organization, the Chinese Academy of Agricultural Sciences, and other partners, support will be continuously provided for young makers between and after the events, empowering them to better address problems.

## *II.    Goals*

1.  ***United Nations Food Systems Summit initiatives*** to be undertaken, while promoting and advocating sustainable and green agriculture.

2.  Enhancing youth's enthusiasm for participating in agriculture activities, so as to promote agricultural and rural carbon emissions reduction and carbon sequestration, as well as advancing sustainable agriculture development.

3.  Exploring innovative approaches complimenting the slogan ***"New Technology, New Pattern, New Service"***.

4.  Building an international exchange platform in green low-carbon agriculture，cultivating young talents .

## *III.    Instructions for Participation*

### (i)    Topics, Tracks and References

Globally speaking, high consumption of agricultural resources in developing countries remains hard to be fundamentally changed, as the green production and low-carbon processing technologies in the planting and breeding industry are relatively backward. This also renders severe agricultural non-point source pollution in several regions, and so are air pollution and carbon emissions caused by bulk coal used both in production and daily life. Youth Hackathon 2023 places stress on the following three dimensions, namely the "environmental protection technology, green market and ecological society", encouraging young people, from three tracks of "New Technology, New Pattern, and New Service", to focus on the potentiality of energy conservation and emission reduction, as well as the decrease of carbon and the enhancement of sink in the whole agricultural value chain of forestation, herding, fishing and comprehensive third industries, so as to promote emission and carbon reduction both in agricultural production and rural areas based on strengthening food security supportabilities.

**Track of "New Technology" (Low-Carbon Technology):** This track focuses on the combination of agriculture and intelligent technologies. Participants should find out how to reduce greenhouse gas and carbon emissions in the process of agricultural production while improving efficiency and sustainability. Here are some case studies and solutions:

- Energy saving and emission reduction in crop production (e.g. optimizing rice field water management and using green cultivation technology). Emission reduction and carbon reduction in animal husbandry (e.g. scientific and technological means to monitor and manage the breeding process, reduce the emission of feces and ammonia, and improve breeding efficiency). Emission reduction and carbon sink enhancement in fisheries (e.g. adopting ecologically

healthy breeding mode and promoting energy conservation and emission reduction).

- Expanding carbon sequestration in farmland (e.g. protective tillage and organic fertilizer application to improve soil quality)
- Intelligent irrigation system (e.g. utilizing sensors and automation technology to monitor soil moisture and climate change, and precise watering to reduce water consumption and improve crop yield)
- Energy-saving agricultural machinery (e.g. using novel and low-energy consumption agricultural machinery such as electric tractors and solar powered harvesters to reduce the usage of fossil fuels and accelerate the popularization of green and intelligent agricultural machinery technology)
- Wind or solar power generation (e.g. setting up wind turbines or solar panels in agricultural areas, using renewable energy to provide electricity for agriculture to reduce carbon emissions)

**Track of "New Pattern" (Green Market):** This track focuses on agricultural product trade and market innovation. Participants may consider how to innovatively develop agricultural products and services into green brands, and achieve emission reduction and sustainable development through market mechanisms. Here are some case studies and solutions:

- Traceability System of Agricultural Products: Establish a full traceability mechanism from the farmland to the table to ensure the quality and security of agricultural products and improve consumer trust and satisfaction.
- Low-Carbon Logistics: Use low-carbon distribution methods such as electric vehicles and bicycles to reduce traffic pollution and carbon emissions.
- Ecological Agriculture Tourism：Combine agricultural products with tourism to create a green ecological agriculture tourism brand, attracting more tourists and augmenting farmers' income.

- Green Finance: Establish a green finance mechanism to provide loans and funding support for green agricultural enterprises, helping them to develop and grow.

**Track of "New Services" (Ecological Society):** This track focuses on proposals regarding rural development and social responsibility, which may include promoting agricultural and rural economic development, solving rural social problems, and improving the ecological environment through social innovation and community participation. Here are some case studies and solutions:

- Environmental Education: Raise public awareness and attention to agricultural environmental protection through community education and publicity, as well as promoting green planting and production methods.
- Ecological Compensation for Agriculture: Encourage farmers to adopt eco-friendly planting and breeding methods, and provide them with economic or other incentives to promote the restoration and protection of the ecosystem.
- Rural Waste Classification: Advocate rural waste classification and recycling, reducing environmental pollution and carbon emissions caused by waste incineration and landfill.
- Community Agriculture: Establish community farms in peri-urban areas, enabling citizens to grow their own food, so as to enhance awareness and participation in agriculture and environmental protection.
- Zero-Carbon Villages and Towns: By adopting low-carbon and zero-emission methods, such as using renewable energy, constructing energy-efficient buildings, and promoting low-carbon agriculture, the carbon emissions of rural communities or parks can be reduced to a minimum.

**(ii)    Tournament Rules**

2023 Youth Hackathon is open to all creators that can contribute towards a reduction in food loss and waste. Team members would ideally be between 18 and 40 years old, of any nationality, with participating economies across the world. Current students may have their mentors as part of the project team. However, the application form must highlight their mentor's role in the project. Please be noted that all proposals and presentations shall be conducted in English.

This Hackathon will be divided into three stages to achieve practical and feasible innovative solutions: preliminary selection, training session, and final competition.

1.  **Preliminary Selection**

    a)  Participating teams set their topics, build their teams, and submit all application materials.

    b)  The committee will evaluate the applications and shortlist them in accordance with the theme of *"New Technology (Low-Carbon Technology), New Pattern (Green Market), New Service (Ecological Society)"* , followed by a public announcement.

2.  **Training Session**

    The organizers will provide training to shortlisted teams, including:

    a)  Public training: recommendations of relevant experts to each team according to the technology/core product involved in the project.

    b)  Customized training: training on PowerPoint production and presentation skills to each team so they may conduct presentations more professionally.

3.  **Final Competition**

    The Final competition will be conducted online and offline due to the epidemic prevention measures. Each team should have a complete and refined presentation and be able to defend their proposal, to participate in the final competition.

**(iii)    Timeline and Key Points**

- ➤ 10 April – 20 July: Application phase
- ➤ 20 July – 20 August: Preliminary selection
- ➤ 20 August: Public shortlisting
- ➤ Late August – Early September: Training Session (Online)
- ➤ The 3rd Week of October: Final Competition (Online)
- ➤ The 4th Week of October: Award Ceremony (Onsite, China)

Note: These dates are subject to change due to a number of factors. All participants are requested to seek current information released by the organizers through the platform or contact details provided.

**(iv)    Entry Requirements**

1. Participants will form teams of 2-5 people depending on the needs of their projects.
2. The team lead must be below 40 years old.
3. Awards are given on a project and team basis. An ideal team should have the following professional background or competencies:
   - ➤ Practice/experience related to sustainable agriculture especially carbon mitigation.
   - ➤ Information technology/software engineering/data engineering.
   - ➤ Project management.
   - ➤ Marketing/New Media Communications.

We encourage teams to be inclusive and create equal opportunities for all, including women, to take key roles in the team. We support interdisciplinary teams to take advantage of their knowledge and skills to offer innovative solutions grounded in practicality.

## (v)    Application Materials

Please complete the application as a team, and send the requested materials to ciar@caas.cn and CC ypardchina@outlook.com.

**Application deadline: 20 July 2023, 23:59 (GMT+8, Beijing Time)**

1. **Application form** (scan the QR code below for access)
2. **Innovative solution** for green low-carbon agriculture with materials and templates (scan the QR code below for access).
   a) **Project proposal in** Word format, not exceeding 15 pages, with the main text in Times New Roman, font size 12, double-spaced, and demonstrative pictures, information, guide, and tables.
   b) **PowerPoint presentation** based on the above proposal, which should not exceed 20 slides.
   c) The innovative solution shall cover:
      ➢ Summary of the solution (Introduce the team's ideas and what contributions will they make on reducing food losses and waste? Up to 250 words)
      ➢ Problem identification (Analysis of challenges relating to carbon mitigation)
      ➢ Vision, Mission and Values of the program (describing the agricultural and rural activities/sub-fields it targets)
      ➢ Elaboration on the program's impact on carbon reduction in the agricultural and rural sectors (achieving a target of XX tons of carbon reduction or carbon sequestration)
      ➢ Societal and economic methodology and technical models (explaining how the target carbon reduction and sequestration is calculated and how it will be achieved)

> ➤ Financial situation (capital raised, capital needed, revenue analysis)

> ➤ Phased development planning (what is the potential contribution of your project 3 years later? How do you plan to achieve? What are the milestones?)

3. **Video presentation** (5 minutes)

    a. Introduce your team (1 minute). *Name, role in the team, education, experience, and qualities or skills.*

    b. Specify why your team should be selected by presenting the solution chosen by the team, ensuring consistency with the content of the PowerPoint (4-5 minutes).

    c. Upload the video online to a video sharing platform (YouTube, Google Cloud, Youku, Baidu Cloud or other platforms). Please share the link to the video in the application, ensuring it can be downloaded.

4. Scan the QR Code below



(Please scan the QR code for the application form and other application materials)

## (vi)  Selection Criteria

The Committee of this Hackathon is composed of experts with various backgrounds, team counselors, and innovation as well as entrepreneurship mentors with experience in reducing food waste and management. Judges are from leading international and national organizations such as the Food and Agricultural Organization of the United Nations (FAO), Chinese Academy of Agricultural Sciences (CAAS), and

other partners.

The projects and their proposals will be assessed according to the following criteria:

> Creativity and innovation
> Possibility of landing and scalability
> Sustainability
> Business model
> Use of open data
> Technical difficulties
> Design and user experience
> The effects when applied or demonstrated

**(vii)   Awards and benefits for the Participants**

> A generous cash prize and a certificate provided by FAO and CAAS.
> Comprehensive experience of an independent innovation and entrepreneurship activity along with partners who share the same values.
> Networking with other teams, UN agencies, CAAS, and partners in the field for future collaboration.
> Feedback and support from industry experts and mentors and gaining valuable insight and ideas on strategic thinking on sustainable agriculture and carbon mitigation under the new paradigm.
> Inspiring workspace where perspectives from different cultural backgrounds are welcomed.
> Referral to pursue educational opportunities for graduate or Ph.D. degrees in CAAS, and preferential access to internships within the Center for International Agricultural Research (CIAR).

## IV.    Partners

| Host Organization |
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| Food and Agriculture Organization of the United Nations |
| Department of International Cooperation of Chinese Academy of Agricultural Sciences |
| Center for International Agricultural Research of Chinese Academy of Agricultural Sciences |
| Young Professionals for Agricultural Development |
| **Supporting Organization** |
| World Food Forum |
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## V.    Other Information

For inquiries or more information, please send an email to ciar@caas.cn and copy ypardchina@outlook.com