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Syngen Group China

MAP

MAP Green and High-Quality Development Report

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Foreword

Sinochem developed the innovative Modern Agriculture Platform (MAP) model to proactively explore green and sustainable development within the agricultural sector. Since 2020, Sinochem Agriculture MAP has been releasing a *MAP Green Development Report* annually to highlight the sustainable development achievements of modern agricultural services and practices, and share experience in modern green agricultural development.

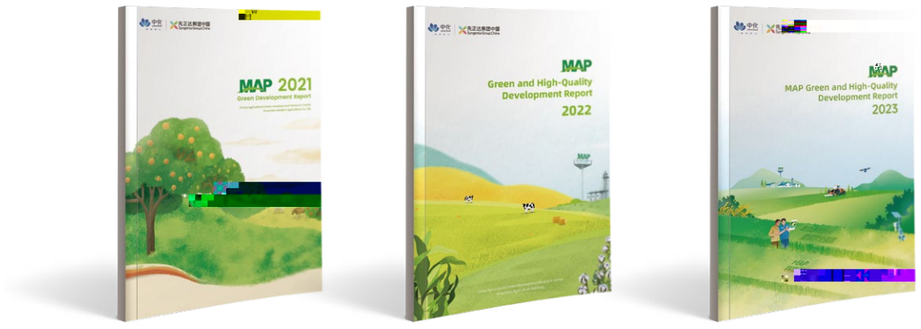
In 2023, MAP conducted a large-scale sample survey among the farmers in the regions where MAP provided services and products through random sampling, both online and offline. The survey covered 3,860 farmers and approximately 117,000 ha of farmland, including three main grain crops and most common cash crops. Data was collected and analyzed using a green development index system. The *Green and High-Quality Development Report 2023* ("the Report") presents that the Agricultural Green and High-quality Development Index of MAP farmers are 45.84 on average, 19.18% higher than non-MAP farmers. The Report also provides in-depth interpretations of some key indicators, and straightforwardly show the contributions of MAP to promoting green agricultural development.

This Report also features a collection of best practices of the MAP team in assisting farmers in adopting green and low-carbon technologies in 2023, witnessing and recording the milestones in promoting green and high-quality agricultural development in China.

May 2024

MAP 中化农业

Seeking transformation for Chinese agriculture and well-being for Chinese farmers



Messages from the Management

Jeff Rowe

Chief Executive Officer, Syngenta Group

General Secretary Xi Jinping pointed out that green development underpins high-quality development, and new quality productive forces are green productive forces. We need to move faster to develop green and low-carbon production and operation methods in agriculture and make every effort to build a new pattern of agricultural development that promotes harmonious coexistence between humans and nature, which is an effective way to implement the new development strategy and an important part of developing new quality productive forces.

Sinochem Holdings actively implements the decisions and plans of the Party Central Committee and the State Council. Accordingly, we promote the MAP mode and provide comprehensive modern agricultural services via our MAP service centers and MAP demonstration farms across China. Based on these platforms, we develop and promote green and low-carbon production standards, standardize farming solutions, and explore the comprehensive utilization of reserve arable land such as saline-alkaline land. Efficient digital technologies are promoted, regenerative agriculture demonstration bases established, and green agricultural brands built. With the aim of conserving water and reducing fertilizers, pesticides, labor, and carbon emissions, we have made particular effort to improve the efficiency of resource utilization and increase the supply of green products, leading the new-type of agricultural businesses and small and medium-sized farmers on the path toward sustainable green agricultural development.

In the future, Sinochem Holdings will continue to work with ecosystem partners, promote green development, accelerate the R&D and application of green agricultural technology, and support the development of new quality productive forces in agriculture through effective environmental protection, efficient resource utilization, and sustainable agricultural development.

With weather extremes, pest pressure and crop failures on the rise, feeding a growing global population and combating climate change have become two major challenges facing the world today.

Syngenta Group supports farmers in their role to tackle these challenges and turn agriculture into a solution to mitigate climate change.

In China, through our MAP Technical Service Centers, we provide farmers with products, services and solutions that help improve productivity and promote sustainable farming practices.

For example, in water-scarce areas, we have promoted low-flow drip irrigation and intelligent control irrigation systems to reduce water consumption through refined pipe networks and intelligent management. We have also promoted the use of core masterbatch and foliar fertilization across the country, effectively increasing soil nutrient absorption and fertilizer use efficiency.

By actively promoting "MAP Zhinong", a digital agriculture App, we also help farmers address challenges associated with climate change and reduce business risks with remote sensing field patrol and lower the use of synthetic fertilizers and crop protection products with precision agricultural technologies.

At Syngenta Group, we are focused on continuously improving the sustainability of agriculture in all that we do. Building on our achievements to date, we are moving forward with a new set of sustainability priorities and targets for a more sustainable future. Integrated across our organization at both strategic and operational levels, these will guide our inno] M. e els,ationalwit no]

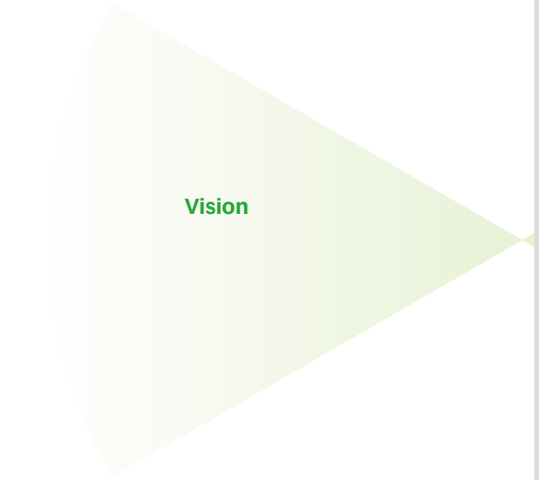
Contents

About Us

Syngenta Group

Syngenta Group is a subsidiary of Sinochem Holdings, and serves as the main operating company within its life science segment. As a global leader in agricultural technology and innovation, Syngenta Group is involved in the development, production, and commercialization of a diverse range of crop protection, seeds, and crop nutrition products, as well as modern agricultural services. Syngenta Group assists farmers around the world, both large and small, in enhancing their yields and adopting sustainable agriculture.

Syngenta Group, which was registered in Shanghai in 2019 with management headquarters in Switzerland, comprises four business units: Syngenta Crop Protection, Syngenta Seeds, Syngenta Group China and ADAMA. The company has a long-standing history of over 250 years in Switzerland and has now grown to employ over 59,000 people,


Vision

MAP Agricultural Green and High-quality Development

Key Priorities of Sustainable Development

The profound impact of sustainable agriculture

Today's agriculture faces significant challenges including nourish a growing population, addressing climate change and protecting our natural resources.

- It is expected that by 2050, the global population will reach 9.7 billion, leading to a 50% increase in food demand compared to current levels.
- Extreme weather events are becoming more frequent globally, with an increasing occurrence of major natural disasters. Meanwhile, agricultural production contributes to 22% of the total global greenhouse gas emissions.
- Agriculture has a substantial environmental impact, as it uses 70% of freshwater and 40% of global soil is being degraded.

Agricultural	Agricultural	Food System
Greenhouse gas emissions	Freshwater consumption	Global deforestation

Key Priorities of Sustainable Development

Syngenta Group China Promoting sustainable practices

Key priorities of sustainable development 1
Higher yields, lower impact

Our initiatives include

Innovative products and technologies

克 蓝麟 优翠露 麦甜 美麟莹

Technology and Tools for Precision Application

Key priorities of sustainable development 2
Regenerate soil and nature

Our initiatives include

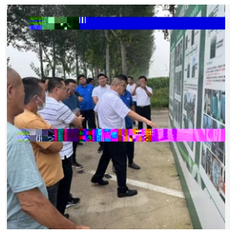
The "Hope Soil Health+" service platform focuses on addressing soil issues by integrating online and offline services, assisting farmers in achieving sustainable planting.

The RootEco offers a comprehensive root solution to adjust microbial environment of the root and foster a harmonious interaction between crop roots and their surrounding environment.

The Run Tian Initiative centers around soil health, promoting the implementation of regenerative agriculture in China.

Key priorities of sustainable development 3
Improving rural prosperity

Our services include



Centralized production management through agricultural co-ops

MAP pioneers new ways to link farmers' interests through various forms such as land equity and production management.

Order-based sales

MAP promotes order-based sales to enhance farmers' incomes.

Key priorities of sustainable development 4
Sustainable operations

Our models include

Zero-Carbon Factory

By creating a "Zero Carbon Factory", Syngenta Kunshan Factory has increased its output value by 17%, with an 11.34% reduction in unit energy consumption and carbon dioxide emissions intensity.

Low-carbon wheat

The low-carbon wheat produced in Huantai, Shandong Province, has increased yield by 7.5% under the same fertilization and irrigation conditions, reducing greenhouse gas emissions by 32%.

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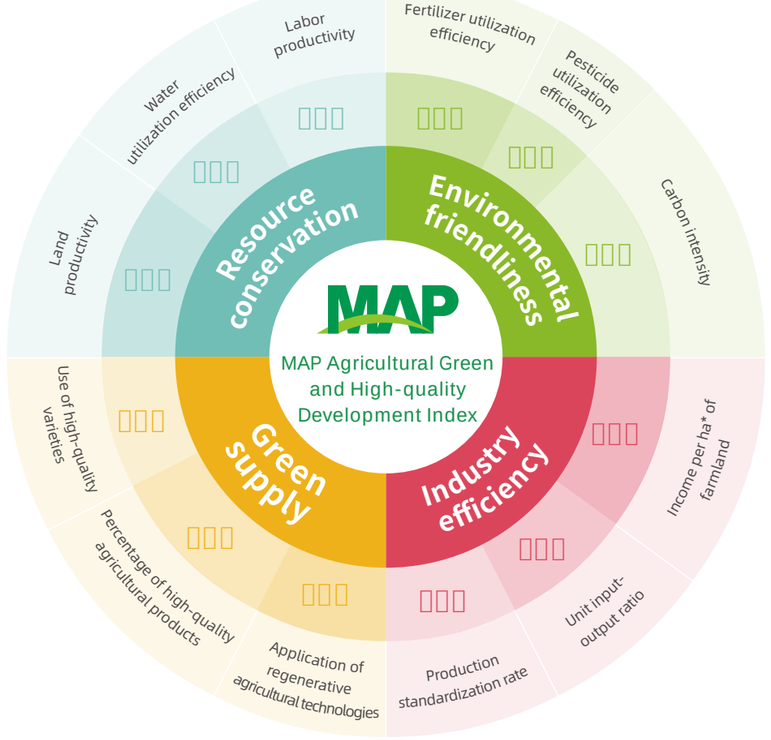


Based on the core concepts of sustainable agricultural development and regenerative agriculture, and aligned with China's carbon-peaking and carbon neutrality strategy, as well as the No.1 Central Documents for 2023 and the National Green Development Plan for Agriculture during the 14th Five-Year Plan Period, MAP developed the MAP Agricultural Green and High-Quality Development Index ("the Green Index"). During the process, we fully balanced between the needs of achieving sustainable development and ensuring agricultural supply, and followed the principles of materiality, systematic, independence, and applicability. The Green Index uses imary indicators, including Resource Conservation, Environmental Friendliness, Industry d Green Supply, and 12 secondary indicators to measure the practices of green rmers from multiple dimensions. Scores of these indicators were calculated to reach a Green Index score, with a total score of 100, based on their relevant weights and in accordance with the research methodology.

Weight determination of indicators

The weights of the Green Index indicators are determined by using the expert scoring method following the Delphi methodology. Experts in the agricultural sector are selected to determine the weights independently, and the weights for the indicator are calculated based on their input statistically.

Calculation of the green index score

Based on the survey data and the definition of indicators, we obtained the scale values of the secondary indicators, which are processed with the entropy weighting method to get the score of the secondary indicators, and calculate the scores of the primary indicators from the weighted sums of the secondary indicators before getting the Green Index score eventually.

Calculation Method of the Green Index Score and the Primary Indicators

Please scan the QR code to see the calculation methodology

Calculation Method of the Secondary Indicators

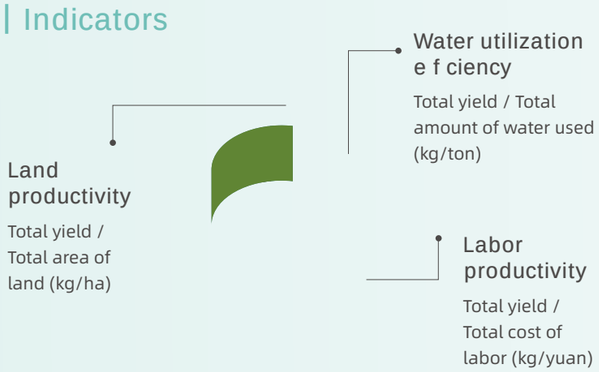
Please scan the QR code to see the calculation methodology

Resource Conservation

Protecting the ecological environment is a fundamental strategy that fosters productivity while maintaining harmony between people and nature. It is an essential approach towards realizing efficient and effective use of resources, and the effective protection and efficient utilization of agricultural resources such as arable land and water.

MAP focuses on addressing the major issues and challenges related to the utilization of agricultural resources. Through the adoption of various innovations and green practices, MAP enhances the management of standardized agricultural production throughout the entire process and helps farmers improve the efficiency of the utilization of key production factors such as land, water, and labor.

Indicators



Indicator de f nitions

The yield of a crop during a single production cycle per unit of farm land.

The ratio between the total yield of a crop to the total amount of irrigation water used during a single production cycle. It is related to factors such as the natural conditions of the irrigation area, conditions of irrigation facilities, water management, and irrigation technology used.

The ratio of crop yield to its corresponding labor cost in a single production cycle of the crop. The lower the production cost, the higher the labor productivity. The survey includes the cost of hiring labors and leasing agricultural machinery, and the payment to agricultural machinery operators, in the calculation of labor cost.

Land Productivity | Improving the utilization rate of saline-alkaline land through tailored solutions in accordance with regions and crop varieties

China has 100 million ha of saline-alkaline land, of which 33.3 million ha have the potential for development and utilization[1]. Enhancing the comprehensive utilization of saline-alkaline land is of great significance for increasing regional grain production capacity and ensuring food security.

MAP has made notable progress in the R&D and demonstration of technologies for the comprehensive utilization of saline-alkaline land.

In Dawukou District, Shizuishan City, Ningxia Autonomous Rb M comprehensive m li nota m com Mcoimr

agronomy. Combining technologies such as water and salt transport in subsurface pipes and water-fertilizer integration management, MAP succeeded in reducing the soil pH value by 0.3-0.8 units, increasing the soil nutrient content by 3%-7%, and transforming low-yield saline-alkaline land into medium- to high-yield land, and saw significant increase in the yield and improvement in the quality of crops such as liquor-making sorghum, forage sorghum, and soybeans. Hence the once saline-alkaline land is greatly improved and efficiently utilized.

In the future, MAP will adopt customized measures based on the conditions of saline-alkaline land in different regions such as Inner Mongolia, Shandong, Jilin, and Hebei. By growing suitable varieties on the land and selecting suitable land for the varieties, MAP will continuously improve the soil quality, increase crop yields on the saline-alkaline land, and boost local grain production.

According to a 2023 survey, the land productivity of MAP farmers was on average

higher than that of non-MAP farmers

The high-quality liquor-making sorghum growing on saline-alkaline land in Dawukou

[1] Lu Lu, Chen Lei. Removing Barriers for Saline-Alkaline Land and Adding Strength to the Granary of China - An Overview of Comprehensive Development and Utilization of Saline-Alkaline Land in China [J]. China Agri-Production News, 2023(15):4-8.

Water utilization efficiency | Promoting smart irrigation to improve water utilization efficiency

The 2023 survey results present that the water utilization efficiency of MAP farmers is, on average,

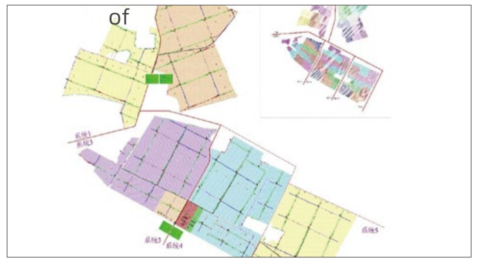
higher than that of non-MAP farmers

Water shortage has become a prominent issue constraining the high-yield farming and efficient development of agriculture. Improving the utilization efficiency of water is crucial for ensuring food security. MAP has been committed to promoting water-saving irrigation technologies and developing efficient and water-saving agriculture.

In 2023, in Inner Mongolia, MAP promoted the EPC+O model, customized irrigation plans for different types of farmlands and actively participated in the construction of high-standard farmlands. Through the refined pipeline network and intelligent management, MAP implemented

the low-flow drip irrigation and smart control irrigation system to improve irrigation uniformity. Compared to traditional small-scale drip irrigation, the system can reduce water consumption by 30%-50%. A single irrigation system can cover over 66.67 ha. of farmland and significantly reduce labor costs. Meanwhile, the even and efficient irrigation system also contributes to yield increase of about 15%.

In addition, MAP has also promoted water-saving technologies and precision irrigation such as drip irrigation in Hebei, Shandong, and Shaanxi, to improve the water utilization efficiency and support sustainable development.



Smart Control Irrigation System Plan

Labor productivity | Promoting digital tools to improve farming quality and efficiency

The 2023 survey results present that the labor productivity of MAP farmers is, on average,

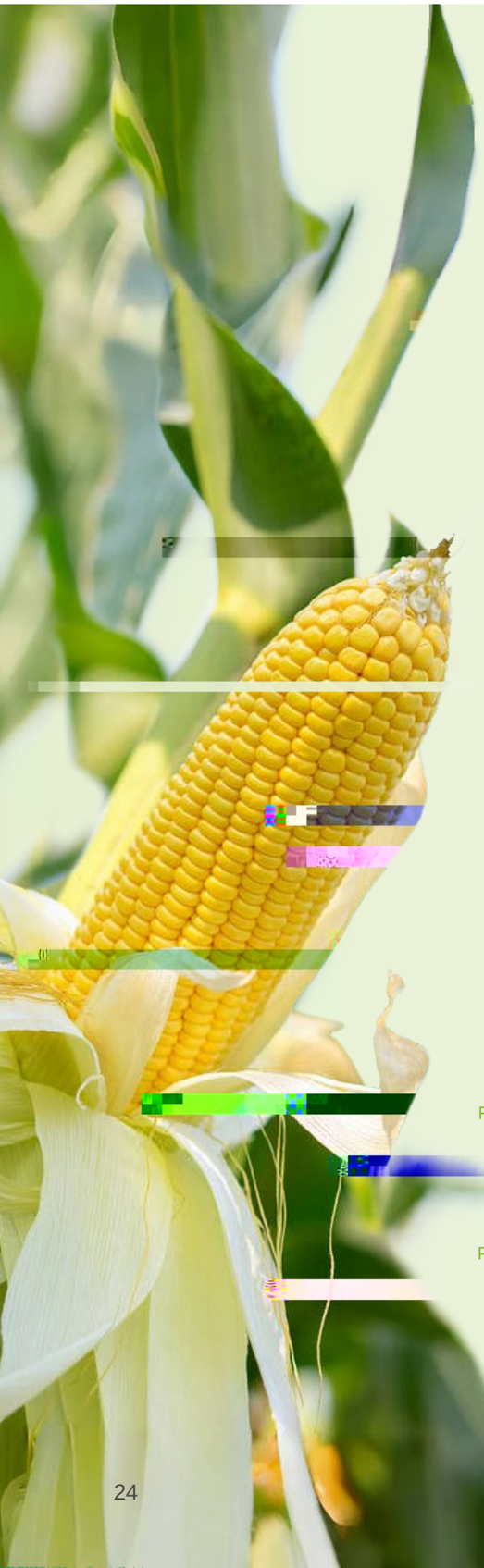
higher than that of non-MAP farmers

To meet the development needs of large-scale farms for efficient agricultural production, it is urgent to enhance labor productivity. MAP has been committed to improving agricultural labor productivity through the development of new quality productive forces.

The development, application, and promotion of digital agricultural technology have always been a core part of the MAP model. The Smart Farming APP developed by MAP offers a wide range of services, including weather forecast, remote sensing for field inspections, soil fertility evaluations, and IoT control, to assist farmers in scientific planting and precision management. It is estimated that, with the help of the APP, small and medium-sized farmers and agronomists can each effectively manage an average of 466.67 ha. of land, significantly increasing agricultural productivity.

Yang Shihua, a farmer on the Xingkai Lake farm in Heilongjiang Province, has been using the MAP Smart Farming APP to manage her 800-ha. soybean farm for three consecutive years. She uses it to record farming data, observe crop growth with the remote sensing feature, access weather forecasts, and identify pests and diseases; her field inspection efficiency has increased by 70%.

Farmer Yang Shihua is reading remote sensing-based crop growth diagnosis.



Environmental Friendliness

"To protect the environment is to protect our productivity, and to improve the environment is to develop our productivity." To promote the full-process green transformation of agriculture, it is essential to adhere to principles of both resource conservation and environmental protection. By doing so, we can strive to establish a new agricultural development pattern that fosters harmony between people and nature.

MAP strives to vigorously promote advanced technologies, such as soil nutrient management and green prevention and control of pests, with the aim of reducing farmers' reliance on chemical fertilizers and pesticides, and optimizing the growing environment of crops. We also attach great importance to climate change, and are committed to contributing to the reduction of agricultural greenhouse gas emissions.

Indicators

Fertilizer utilization e f ciency

Total yield of crop / Total amount of fertilizers used (kg of crop yield / kg of chemical fertilizer used)

Pesticide utilization e f ciency

Total yield of crop / Total amount of pesticide used (kg of crop yield / ml of pesticide used)

Carbon intensity

Total carbon emissions from farmland / Total yield of crop (kg of CO_2e / ton of crop yield)

Indicator de f nitions

Fertilizer utilization e f ciency

The crop yield that can be produced per unit of fertilizer application, which varies with factors such as crop varieties, soil conditions, cultivation management, and fertilization techniques.

Pesticide utilization e f ciency

The crop yield that can be produced per unit of pesticide application, which varies with factors such as the application time and the application tools used.

Carbon intensity

The direct or indirect greenhouse gas emissions caused by various agricultural activities during the entire production process of producing a unit of crop yield. The survey includes seeds, fertilizers, pesticides, plastic films, and energy consumption of agricultural machinery and irrigation as carbon emission sources.

Survey f ndings

Environmental friendliness

Fertilizer utilization e f ciency

(kg of crop yield / kg of chemical fertilizer used)

%

Average improvement with MAP services for fertilizer utilization efficiency

Indicator interpretations

Fertilizer utilization e f ciency

MAP promotes fertilizer reduction and efficiency improvement through technological innovation and customized solutions. MAP focuses on the research and development of new and efficient fertilizer product solutions, promotes scientific fertilization technology through soil testing, effectively improves soil nutrient absorption rate and fertilizer utilization efficiency, and reduces application through core technologies such as microbial agents, phosphorus efficiency enhancement, and membrane for controlled release.

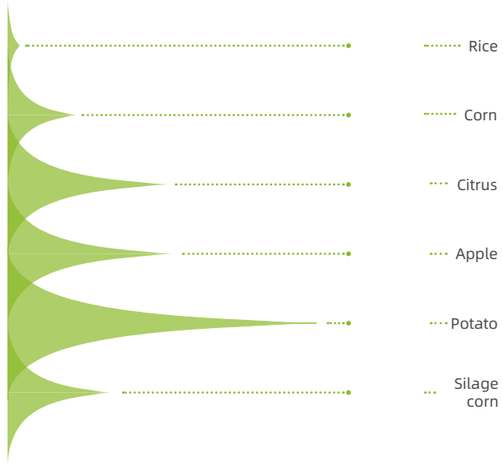
Fertilizer utilization e f ciency

(kg of crop yield / kg of chemical fertilizer used) 2021-2023

All crop — MAP farmers — Non-MAP farmers

Fertilizer utilization e f ciency

(kg of crop yield / kg chemical fertilizer used) 2023



Fertilizer utilization e f ciency

Promoting e f cient fertilization, advancing green and low-carbon development

Enhanced growth

Leaf nutrient status analysis with the core Masterbatch technology

Pesticide utilization e f ciency

Developing digital crop protection solutions with AI to enhance pesticide e f ciency

In 2023, MAP made digital crop protection development and application one of its top priorities. Empowered by AI technology, MAP independently developed the crop disease, pest and weed image recognition technology and the real-time risk alert technology that are applicable to a great variety of diseases and pests. They can accurately identify 226 diseases, 394 pests, and 419 weeds for major grain crops and cash crops such as citrus, apples, and grapes, with the average accuracy rate of 80%. Furthermore, advanced monitoring algorithms were employed to identify complex symptoms and provide corresponding crop protection recommendations. Using the forecast data, agronomists can provide crop protection solutions to farmers, which can enhance pesticide efficiency by 15% and diminish the risk of crop damage from chemicals by 10%. MAP's AI-empowered precision crop protection solution combines AI-empowered weed identification technology with intelligent contr ommtion

Carbon emissions intensity

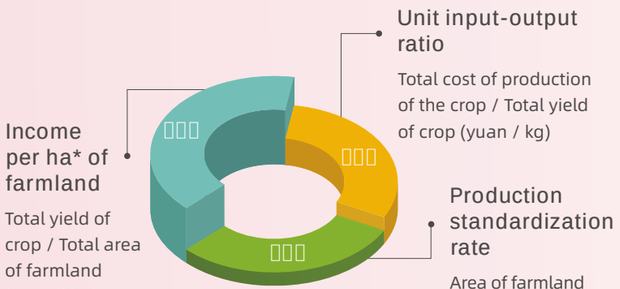
Strengthening collaboration with research institutes to reduce greenhouse gas emissions

Industry E f ciency

The *14th Five-year Plan for Promoting Agricultural and Rural Modernization* puts forward a development goal that prioritizes the steady improvement of the quality, efficiency, and competitiveness of the agricultural sector in China.

MAP constantly innovates and improves agricultural service models to help Chinese farmers improve the quality of agricultural produce and farming productivity. By doing so, we aim to improve standardization and efficiency, boost crop yields, reduce input costs, help farmers increase their income through multiple channels, and further explore the potential to improve quality and efficiency.

Indicators



Indicator de f nitions

Income per ha of farmland

The total income per unit of farmland generated by farmers through the sale of crops. This indicator measures the benefits farmers receive from crop cultivation

Unit input-output ratio

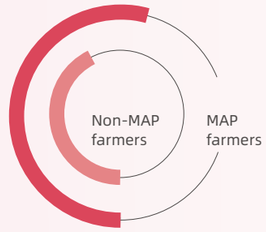
Refers to the ratio of total planting cost to total crop output in the agricultural production process within a single crop production cycle. The smaller the value the better. The investment in planting in the survey includes land rent, seeds, fertilizers, pesticides, labor, agricultural machinery, irrigation, plastic sheeting, and other expenses.

Production standardization rate

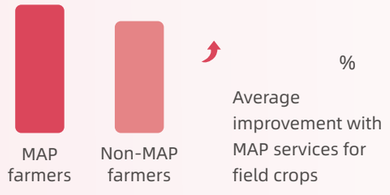
Standardized production refers to standardized activities of the entire agricultural industrial chain. Standards for key industrial chain activities are formulated, revised and implemented to ensure necessary and reasonable level of standardization.

Survey f ndings

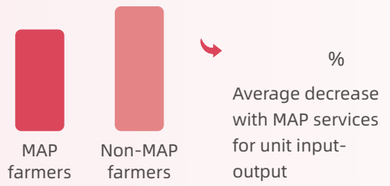
Industry E f ciency



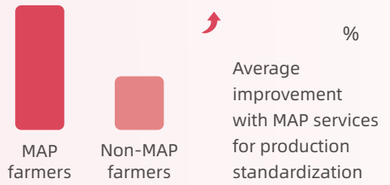
Income per ha* of farmland (yuan / ha)



Unit input-output ratio (yuan / kg)



Production standardization rate (%)



Indicator interpretations

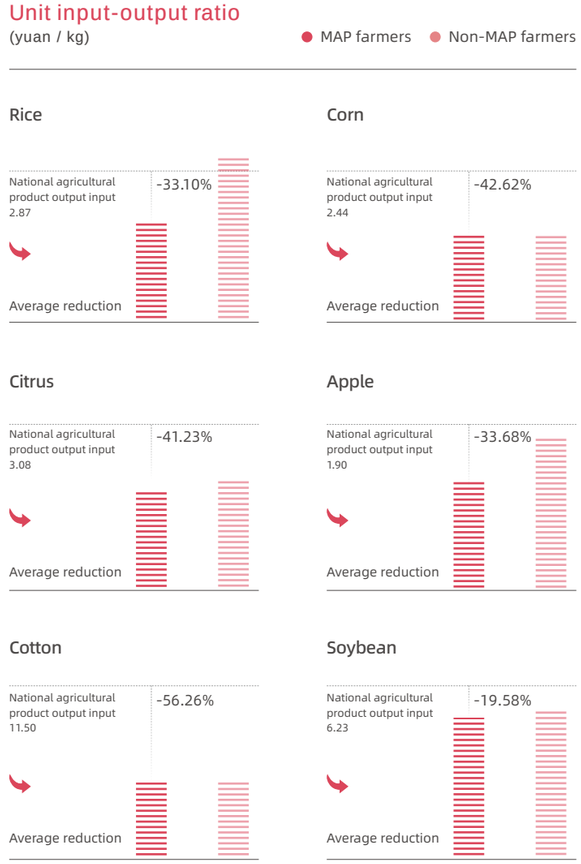
Unit input-output ratio

The reduction of costs in producing unit output within the crop production cycle is a highly effective way to improve the industry efficiency of agricultural green development.

By enhancing the application efficiency of key products of seed, fertilizers, pesticides, and machinery, and providing farmers with full-process services ranging from cultivation, growing, management to harvesting, MAP help farmers improve planting efficiency, reduce cost, and improve both crop quality and yield.

Unit input-output ratio

(yuan / kg)



Notes: Notes: 1. National statistical data is sourced from the *National Agricultural Product Cost and Pro f t Data Compilation 2023*.
2. The production cost surveyed in this report does not include the discounted cost of household labor and the cost of land rent.

Income per ha of Farmland | Establishing a high-quality MAP grain production base and diversifying farmers' income sources

MAP is committed to increasing farmers' output and income by linking upstream grain production and downstream processing of the industry chain. MAP collaborated with Wuliangye Group in Sichuan province to remove obstacles in the production of high-quality grains for brewing liquor. We customized a service system covering "seeding, harvesting, storage, transportation, and delivery", and provided comprehensive solutions and professional services that combine improved varieties and good methods. MAP has developed five special crop nutrition formulas and 16 crop protection technologies, which are applied in Wuliangye MAP Grain Production Base, and have significantly improved the quality of grains and helped Wuliangye Group achieve lifecycle quality control.

Farmers in the base signed planting contracts with MAP and used the wheat varieties and whole-process technical services that MAP suggested. As a result, the average wheat yield increased by 10%-16%, with prices exceeding the market average by RMB 0.04-0.10/kg, leading to an additional income of RMB 1,800-2,250 per ha.

MAP's technical services not only increased the income of farmers, but also improved the quality of grains for brewing liquor, and thus won recognition from local governments, winemakers, and farmers.

Wuliangye MAP Grain Production Base

Income per ha of Farmland | Order-based Farming: Small Lemons, Large Industry

MAP and Mixue Ice Cream & Tea have jointly launched a model of integrated service for the whole lemon planting industry chain. The service model covers more than 2,867 ha of farmland. Mixue Ice Cream & Tea is responsible for sales with minimum purchase price, while MAP offers full-process planting solutions and professional services. This collaboration has expanded local lemon planting industry, directly boosted the income of growers, deeply integrated the upstream and the downstream of the industry chain, and contributed to local rural revitalization.

In September 2023, Mixue Ice Cream & Tea signed the purchase contract with the first batch of growers utilizing MAP services. The lemons harvested were then graded and purchased at the price varying from RMB 3.6 to RMB 5 per kg, depending on their quality, which was far higher than local market price. Moreover, with MAP's full-range technical services, the average yield increased by 11,250 to 15,000 kg per ha, or 20% to 40%, with an additional income of RMB 30,000 per ha. In 2023, MAP delivered 25 million kg of high-quality lemons with low pesticide residue to Mixue Ice Cream & Tea, meeting the latter's demand for stable supply of lemons. This initiative ensured safer lemons, more income for farmers, and a more prosperous industry.

MAP Mascot and Mixue Ice Cream & Tea Mascot

Unit Inp… Output

MAP co… full-proc… technic… increas… in agri…

Guang… locate… Auton… an ar… stand… it ha… alloc… or do… not c… also … bene… soil … conc…

Production Standardization Rate Advancing the "Co-op Service Model": Exploring standardized agricultural production

While delivering services to farmers, MAP

Joint meetings for promoting centralized land management with local government

Production Standardization Rate Building digital villages to enhance the e f ciency of regional industries

Huantai digital agriculture and smart village platform

Green Supply

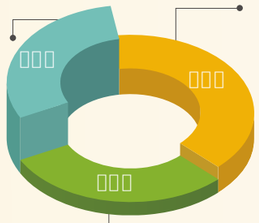
According to No. 1 document of 2024 of the Ministry of Agriculture and Rural Affairs of the People's Republic of China, we shall "increase the supply of green and high-quality agricultural products." To this end, we need to advance the program of Superior Varieties, Quality Improvement, Brand Building and Standardized Production (VQB-S) for agricultural production and agricultural products, and accelerate the construction of agricultural production bases for green, organic products, local signature products, and branded, specialty, high-quality and novel products.

Adhering to the guidance of "quality and green agriculture", MAP actively integrates and promotes green production technologies and practices. These practices include promoting variety screening, quality improvement, brand building and standardized production, and the application of regenerative agricultural practices, to encourage the development of green, high-quality, branded and unique agricultural products.

Indicators

Application of regenerative agricultural technologies

Area of farmland with green production practices / Total growing area of the crop (%)



Percentage of high-quality agricultural products

The output value of high-quality agricultural products / Total output value of all agricultural products (%)

Use of high-quality varieties

Area of farmland growing highquality crop varieties / Total growing area of the crop (%)

Indicator definitions

Application of regenerative agricultural technologies

Regenerative agricultural practices include conservation tillage (no tillage or lesstillage, straw covering, green covering, etc.), soil testing and fertilizer formulation, and green crop protection (physical and biological), etc. During the survey, areas with one or more such practices are considered as areas with regenerative agricultural practice.

Percentage of high-quality agricultural products

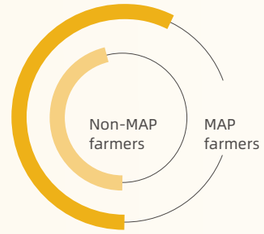
The ratio of the output value of high-quality agricultural products to the total output value of all agricultural products. The term "high-quality produce" used in the survey refers to product produced with premium-pricing orders.

Use of high-quality varieties

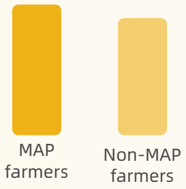
High-quality varieties refer to crop varieties that have valid national or provincial approval for growing in suitable ecological areas.

Survey findings

Green supply



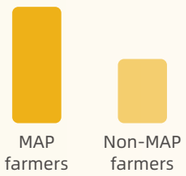
Application of regenerative agricultural technologies (%)



%

Average improvement with MAP services for application of regenerative agricultural technologies

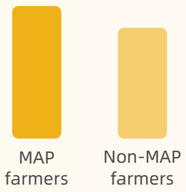
Percentage of high-quality agricultural products (%)



%

Average improvement with MAP services for percentage of high-quality agricultural products

Use of high-quality varieties (%)



%

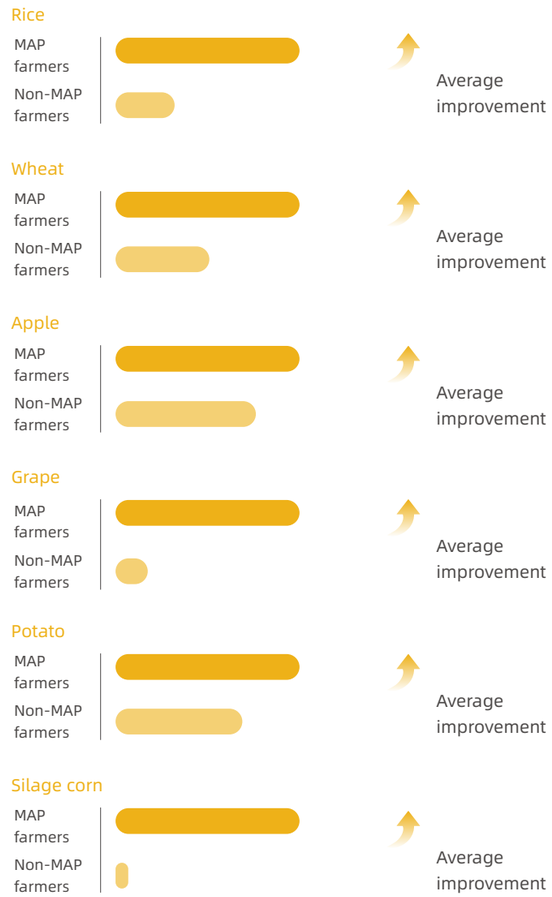
Average improvement with MAP services for use of high-quality varieties

Indicator interpretations

Percentage of High-Quality Agricultural Products

MAP has utilized blockchain and big data technologies for many years to establish the MAP beSide quality control and traceability system. Consumers can directly access information about the farm-to-fork movement of agricultural products by scanning the MAP beSide QR code. With the endorsement of MAP beSide, high-quality agricultural products can be sold at a premium price they deserve, which will not only increase the farmers' income but also enhance the food security in the stages of processing, circulation, and consumption. At present, more than 200 high-quality products, traceable on and endorsed by the MAP beSide system, have entered the market.

Percentage of high-quality agricultural products %



Application of Regenerative Agriculture Technology

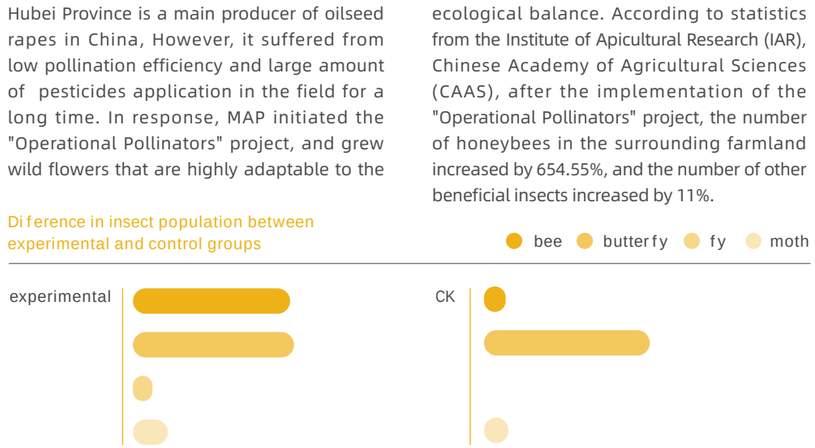
Exploring the Utilization of Fractional Farmland to Conserve Biodiversity

Agricultural production is experiencing a severe challenge of declining biodiversity. The decrease in biodiversity is a drag on the healthy and sustainable development of agricultural ecosystems. In response, MAP actively explores effective ways to utilize fractional farmland, such as promoting the planting of nectar-producing flowers, which has increased farmland biodiversity and improved crop yield and quality.

Hubei Province is a main producer of oilseed rapes in China, However, it suffered from low pollination efficiency and large amount of pesticides application in the field for a long time. In response, MAP initiated the "Operational Pollinators" project, and grew wild flowers that are highly adaptable to the local environment, easy to plant and grow, such as the Cosmos, Spider Flower, Borage, in fractional areas around oilseed rape (or rice) fields, such as field margins and roadsides. As a result, the diversity of the surrounding farmland environment was greatly enhanced.

While ensuring crop yield, quality, and farmers' income, the project has significantly caused an increase in pollinators and promoted ecological balance. According to statistics from the Institute of Apicultural Research (IAR), Chinese Academy of Agricultural Sciences (CAAS), after the implementation of the "Operational Pollinators" project, the number of honeybees in the surrounding farmland increased by 654.55%, and the number of other beneficial insects increased by 11%.

Difference in insect population between experimental and control groups



The pilot "Operational Pollinators" project conducted by MAP Hubei, Shandong, and Tianjin for effective utilization of fractional farmland - planting nectar-producing flowers in such farmland to create habitats for pollinators - represents a novel exploration of renewable agricultural technical measures and offers a new technological path toward green and sustainable agriculture.

Application of Regenerative Agriculture Technology

MAP Tianjin Center won the award of national demonstration farm for the whole industry chain standardization and modern agriculture

In 2023, the MAP Tianjin Center transformed the original saline-alkaline land into a demonstration farm for the whole industry chain standardization of rice production, featuring standardized, mechanized, information-based and intelligent planting, harvesting, and sales. It was recognized as a national demonstration farm for the whole industry chain standardization and modern agriculture.

The demo farm utilized comprehensive techniques such as land preparation, biodegradable agricultural films, and planting of nectar-producing flowers to improve biodiversity. In this way, the physical and chemical properties of soil are enhanced to prevent soil salinization and the farmland environment are protected for the growth of high-quality agricultural products. The pH value of the farmland decreased from above 8.5 to 7.5, and the saline-alkaline land once overgrown with reeds has been transformed into fertile fields suitable for rice cultivation. By selecting superior varieties, customizing solutions, and providing agricultural machinery, MAP built a rice production base that is standardized, mechanized, and modern.

Through the adoption of MAP beSide quality control and traceability system, farmers increased their income by over 10%. and increased yield per unit area on the demo farm of Xiaozhan Rice from the initial 6,000 kg/ha to a maximum of 10,500 kg/ha, producing rice that meets the national first-grade standard. Building upon these significant achievements, MAP has widely promoted this practice in Baodi, Jinnan, and Ninghe in Tianjin, serving over 11,333 ha of Xiaozhandao rice fields annually.

MAP Tianjin Center, a national demonstration farm for the whole industry chain standardization and modern agriculture

Percentage of High-Quality Agricultural Products

The Ready-to-Eat Kiwifruit Technology Enhances the Fruit Quality

China is the world's largest producer of kiwifruit, with an annual output of 2.8 million metric tons, but also imports more than 120,000 metric tons of high-end ready-to-eat kiwifruit a year. Due to lack of precision control in storage and delivery, homegrown kiwifruit varies in quality, and is sold at a much lower price than the imported ready-to-eat fruit.

Over the course of three years, MAP has integrated advanced technologies at home and abroad, conducted research on fruit picking and post-harvest ripening control, had a good command of the physiological starch-to-sugar change during the ripening process, and accordingly developed the ready-to-eat and controlled ripening technology as well as specialized equipment. This technology enables precision control of the kiwifruit ripening process, resulting in a 5% increase in sugar content and extending the edible window of the ready-to-eat fruit to over 15 days. This makes hard fruit ready-to-eat, comparable to imported products in quality. Moreover, MAP has taken the lead in formulating the first social organization quality standard for delicious ready-to-eat kiwifruit in China. The formulation and application of this standard, along with the development of relevant technology, have directly and significantly increased the income of fruit growers using MAP services, thereby promoting the high-quality development of the regional kiwifruit industry.

Traceable ready-to-eat kiwifruit

A joint production plant of Sinochem Agriculture MAP and Jiajiayue Group Co., Ltd.

Percentage of High-Quality Agricultural Products

Cultivating high-quality, low-cadmium rice by applying matching technology in introduced varieties

Farmers can increase their income by approximately RMB

□□□□ per ha

each season

To reduce the risk of excessive cadmium in rice, MAP collaborated with top scientists, introduced the low-cadmium rice variety "Anliangyou 2" and developed special planting solutions for trial planting. Through biotechnological breeding and genetic improvement, this variety exhibits weak adsorption of cadmium and low accumulation of heavy metals, ensuring the quality and safety of rice products.

MAP farms and multiple demonstration sites show that this variety's growth period is 10 days shorter than existing common varieties. The cadmium content in the stems, leaves, and rice of this variety is 84.95%, 91.49%, and 71.49% less than in local conventional varieties (such as Quanyou 1606), respectively. Cadmium content at all test sites is within the approved limits. Farmers can increase their income by approximately RMB 1,320 per ha each season.

In the future, the combination of improved varieties and planting methods can fundamentally eliminate the issue of excessive cadmium in rice , produce high-quality, low-cadmium rice, increase the green rice supply and promote the high-quality development of the industry.

Experts gave on-site guidance on a demonstration farm growing the low-cadmium rice variety Anliangyou 2

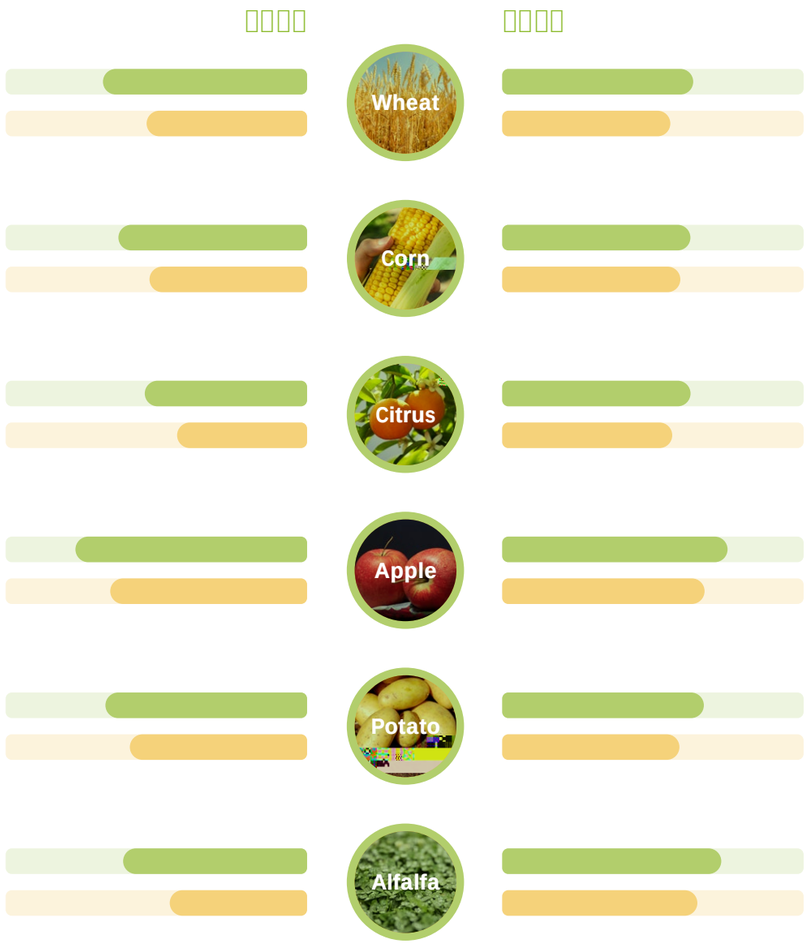
Summary and Outlook

In 2023, MAP continued to explore ways to pursue green and sustainable agriculture. Significant progress was made in promoting the efficient use of land and water resources, reducing the use of fertilizers and pesticides, implementing the Superior Varieties, Quality Improvement, Brand Building and Standardized Production (VQB-S) Action, and applying other green agriculture technologies. Through proactive measures, we improved the resource utilization and farming efficiency. Compared with non-MAP farmers, MAP farmers saw an increase in the land productivity by an average of 15.26%, fertilizer and pesticide utilization efficiency by an average of 29.66%, and income per ha of farmland by 16.26%, while GHG emissions were reduced by 19.38%.

By crop types, specialty crops such as potatoes and alfalfa continued to lead in terms of scale and in the Green Index, and cash crops such as citrus and apples showed significant overall improvement compared to the previous year. However, the overall score in the Green Index was less than 50, leaving much room for improvement.

2023 Green Index Score by Crops

MAP farmers Non-MAP farmers



In the future, MAP will continue to prioritize food security, resource security, and ecological security, and develop and apply the regenerative agriculture technology to elevate the Green Index score of field and cash crops. We will also explore the implementation of the green and low-carbon MAP model to help farms reduce carbon emissions while increasing efficiency. In this process, we will double down on recycling agricultural waste, and seek continuous innovation to promote the green and high-quality development of agriculture in China.

About This Report

Independent certi f cation statement

We hereby commit that a comprehensive assessment and certification has been conducted on the assessed and certified party in accordance with standardized and complete procedures. The materials submitted by the assessed and certified party are deemed authentic and valid. This assessment and certification report is objective, impartial, and supported by substantial evidence, faithfully and accurately reflects the findings throughout the assessment and certification process, and presents conclusion[redacted] reports, and are willing to assume all liabilities and responsibilities associated therewith in the event of any fraudulent misrepresentation or intentional concealment of issues concerning the assessed entity during the assessment and certification process.

Signature :

(Official Seal)

Annex: Institutional quali f cations

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