SDGs of Agricultural Machinery Industry in Japan

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Introduction

First of all, I sincerely congratulate AMA on its 50th anniversary. I would like to pay tribute to Mr. Yoshisuke Kishida's great contribution, through which AMA, as an international magazine on agricultural mechanization, has continuously been publish for 50 years.

"SDGs and agricultural mechanization of the world" is a very timely issue. Agricultural machinery manufacturers are keenly aware of the importance of SDGs and making efforts to associate their activities with the SDGs in accordance with their respective situations.

Regarding SDGs in agriculture and agricultural machinery sector, I will give an overview of the government's efforts at first, and then the private sector's efforts including KUBOTA Initiatives hoping that useful information is conveyed to readers.

Government Policy

In December 2019, the Japanese government revised "SDGs Implementation Guiding Principles", which is a mid-to-long term national strategy for implementing the 2030 Agenda and achieving the SDGs in Japan and internationally by 2030. The principle set the following eight priority areas for efforts toward the establishment of Japan's "SDGs Model." (Table 1)

Table 1　Eight priority areas in the "SDGs Implementation Guiding Principles"

(People)
1 Realization of gender equality and a society where every person can play an active role
2 Achievement of good health and longevity
(Prosperity)
3 Creating growth markets, revitalization of rural areas, and promoting science

& technology and innovation
4 Sustainable and resilient land use, promoting quality infrastructure
(Planet)
5 Energy conservation and renewable energy, disaster risk reduction and climate change countermeasures, sound material-cycle society
6 Conservation of biodiversity, forests, and oceans, and other environments
(Peace)
7 Achieving peaceful, safe and secure societies
(Partnership)
8 Strengthening the means and frameworks for the implementation of the SDGs

Specific measures and their budgets to promote each priority areas are visualized in the SDGs Action Plan formulated by the Promotion Headquarters. The latest version, which is "SDGs Action Plan 2020", illustrates three main pillars, i.e., "Business and Innovation," "Regional Revitalization," and "Empowerment of the Next Generations and Women", in order to accelerate the establishment of Japan's "SDGs Model".

Smart agriculture, which is deeply relevant to the agricultural machinery industry, is included in the first pillar, "Business and Innovation". Stable food supply, sustainable agriculture and rural development are not implicitly shown in the pillars, but described as important components in the related priority areas.

The agricultural machinery industry fully supports such government policies on SDGs. I am convinced that experience and knowledge accumulated in the industry will continue to contribute to achieving the SDGs in Japan, as well as in the world, through solving various issues in the agricultural sector.

Initiatives by private sectors

Charter of Corporate Behavior by Keidanren

Keidanren (Japan Business Federation) revised its Charter of Corporate Behavior in 2017 (the original version was published in 1991), in which the principles of the responsible behavior by corporations are laid down, with the primary aim of proactively delivering on the SDGs through the realization of "Society 5.0" in 2017.

"Society 5.0", which was advocated by the Cabinet Office in 2016, means the fifth and newest society in the history of human social development, following on from the hunter-gatherer society, agrarian society, industrial

society, and information society. The creation of such a society is in line with the SDGs, as shown in the subtitle of the Charter. "For the Realization of a Sustainable Society". Member corporations are expected to fulfill their social responsibility with a strong sense of ethical values, by acting according to the following ten principles. (Table 2)

Table 2　Ten principles in the "Charter of Corporate Behavior"

- Sustainable economic growth and the resolution of social issues
- Fair business practices
- Fair disclosure of information and constructive dialogue with stakeholders
- Respect for human rights
- Relationships of trust with consumers and customers
- Reform of work practices and enhancement of workplace environments
- Engagement in environmental issues
- Involvement in community and contribution to its development
- Thorough crisis management
- Role of top management and implementation of this Charter

The Charter explicitly requires member corporations to act towards the achievement of the SDGs. The role of a corporation is to realize a sustainable society on the basis of fair and free competition. Members of the agricultural machinery industry will fulfill their social responsibility in cooperation with members of the other industries.

JAMMA Activities

Japan Agricultural Machinery Manufacturers Association (JAMMA) is the nationwide organization of agricultural machinery manufacturers in Japan, founded with the aim of contributing to the sound development and progress of agricultural machinery industry as well as the growth of national economy.

The scope of JAMMA's works extends to a wide range of issues, such as the development of safety technology, matters on the environment regulation, standardizations related to agricultural machinery, export promotion, etc.

Agricultural machinery is indispensable for farmers, and contributes to increase the productivity of food production which is related to the Goal of the SDGs. In addition, I recognize that standardization, exhaust gas regulation compliance and smart agriculture are also positioned in the SDGs. JAMMA will continue to actively promote these activities.

KUBOTA Initiatives

The Kubota Group is committed to achieving SDGs in the areas of food, water, and the environment, which are indispensable for human beings. The Kubota Group continues to support the future of the earth and human society through providing its products, technologies and services. (Figure 1, Table 3, Table 4)

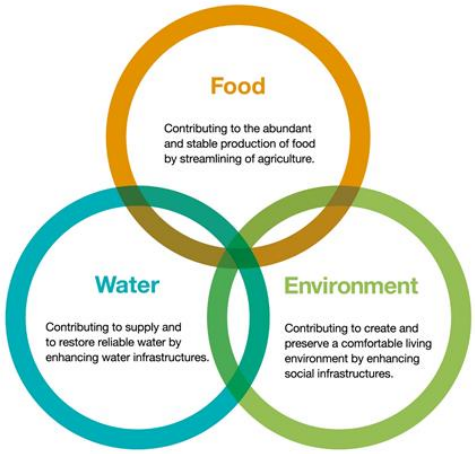

Figure 1 KUBOTA Global Loop

（スペースが空いていますが、次ページに Table3・4 を記載しております）

Table 3 Social issues to be addressed by Kubota Group

Areas	Situations	Expectations
Food	- The world production of major crops in FY2027 is expected to increase by 12.2% compared to FY2017	Based on the projection of the farm population and the crop harvest area, the crop yield growth is needed for the increase of the production. The mechanization of agriculture, including the installation of smart agriculture will be essential for enhancing the productivity.
	- The world harvest area of major crops in 2027 will be expected to be almost the same level as the average of those in 2014-2016 (700 million ha)	
	- The world population in 2027 is estimated to increase by 10.4% compared to 2017	
	- The net increase in the world population from 2017 to 2027 will occur in the urban population, and not in the rural population	
Water	In developing countries, as of 2015, - 2.1 billion people lack access to “safely managed” water - 840 million people have still not received the basic water supply - 4.5 billion people have no access to “safely managed” sanitary facilities	Development of safe water, sewage and sanitary facilities is expected.
	In Japan, the deterioration of water/sewerage pipelines and facilities, and securing enough manpower and handing down expertise and skills in the aging society are the big issues.	Efficient operation of water supply and sewerage undertakings are expected.
Environment	- The ratio of the urban population to the total world population is estimated to rise from 55% in 2017 to 60% in 2030. - The number of cities with a population of 10 million or more (megacities) will increase from 33 in 2018 to 43 in 2030.	In accordance with the progress of urbanization, further development of social infrastructure is expected.
	- The frequencies of rainstorms, flooding’s, water shortages, etc., which is said to be related to the global warming seem to increase. The risks of natural disasters, such as typhoons, earthquakes and tsunamis, etc., also seem to increase.	The disaster prevention and preparation as well as the prompt restoration measures after disasters are expected.

Table 4 Contributions to SDGs by KUBOTA GROUP

	Approach to creating value (Approach to promoting SDGs)	Main related SDGs	The Kubota Group's SDGs KPI
Food	Contribute to the abundant and stable production of food by the streamlining of agriculture.	 	- Contribution to the food production through further spreading agricultural machineries - Promotion of smart agriculture utilizing IoT and robot technologies (KUBOTA Smart Agri System (KSAS))
Water	Contribute to the supply and restoration of reliable water by enhancing water infrastructures.	 	- Contribution to the development of sustainable water-related infrastructure, through providing products, technologies and services, related to water and sewage, as well as water treatment facilities - Contribution to the efficient operation of water-related facilities, through utilizing IoT technologies, as well as combining expertise on the water-related products and the expertise on water treatment technology, mapping/design technology and construction.
Environment	Contribute to creating and preserving a comfortable living environment by enhancing social infrastructures.	 	- Contribution to the development of environment friendly and sustainable urban infrastructures - Contribution to the development of sustainable and resilient urban infrastructures that are robust against disasters

Kubota Aims for Smart Agriculture

By promptly introducing ICT (information and communication technology) and robotic technology in agriculture, Kubota will realize smart agriculture that reduces labor and increases precision, contributing to the abundant and stable production of food.

Kubota Smart Agri System (KSAS)

KSAS is a farm management information system, consisting of two parts, i.e., "Farming support system" and "Machinery service system". "Farming support system collects and stores a variety of agricultural data through automated agricultural machinery with IoT device and field/remote sensing system etc. Based on the analysis of the collected data, farmers can improve farming practices and increase profitability. With "Machinery service system", farmers can receive a timely maintenance service. KSAS enables efficient farm operations, relying not on experience and intuition, but on data.

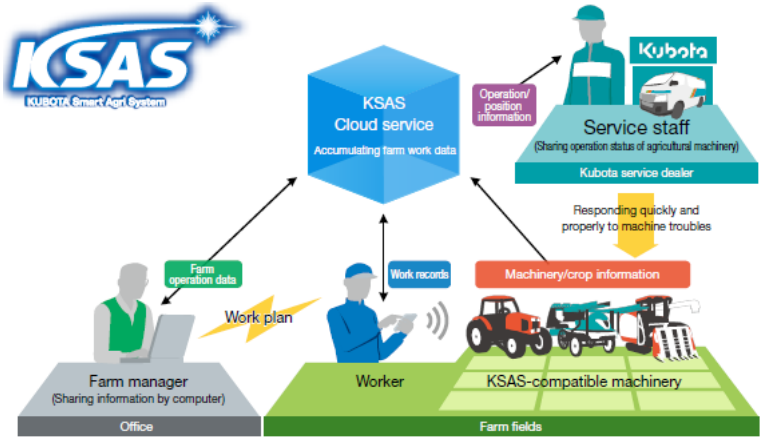

Figure 2 Kubota Smart Agri System (KSAS)

Kubota Agricultural Machinery with GPS

Using GPS (global positioning system), Kubota has developed an autonomous tractor and rice transplanter capable of performing unmanned automatic operations under manned monitoring, as well as combine harvester that carries a human operator while performing autonomous operations, and a rice transplanter able to self-steer to keep a straight line of travel.

AGRIROBO Tractor capable of performing unmanned automatic operations

AGRIROBO Combine harvester with automated driving assist function

Rice transplanter with keeping straight function

Final Commentaries

The private sector is being called on to exercise creativity and innovation to deliver on the Sustainable Development Goals (SDGs) for realizing a sustainable society. Understanding that the development of the private sector is founded on the realization of a sustainable society, and the private sector should fulfill its social responsibility.

According to "World Population Prospects in 2019" published by the United Nations, the global population is projected to grow to around 8.5 billion in 2030, 9.7 billion in 2050, and 10.9 billion in 2100, from 7.7 billion in 2019.

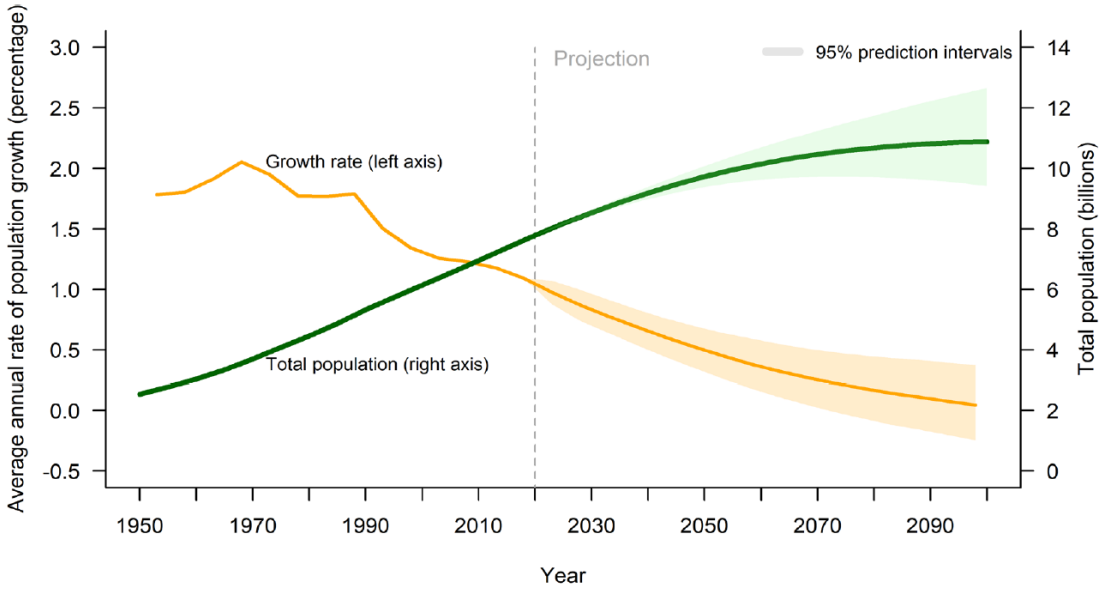

Figure 3 Population size and annual growth rate for the world:

Estimates, 1950-2020, and medium-variant projection with 95 per cent prediction intervals, 2020-2100

FAO estimates that "to meet demand, agriculture in 2050 will need to produce almost 50 percent more food, feed and biofuel than it did in 2012".
Under the constraint of farm lands, the increase in production would be achieved mainly through yield growth.

Table 5 Increase in agricultural production required to match projected demand, 2005-2050 (per cent)

	2005/07	2050	2005/07 2012	2013-2050
World				
As projected in AT2050	100	159.6	14.8	44.8

Source: FAO 2017, "The future of food and agriculture"

I believe that agricultural machinery industry must play a key role in the improvement of agricultural productivity. We should continue to move forward, recognizing that expectations to the industry are growing, and at the same time our responsibility becomes greater.

Last but not least, I would like to express my deepest appreciation to AMA for giving me this kind of opportunity. I wish AMA will continue to flourish as an international magazine of agricultural mechanization in the future.

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