

Plant Factories in Netherlands and Japan: Research Findings in 2010

◆ Research Outline

Yano Research Institute has conducted a study on the plant factories in Holland and Japan as described below.

- Research period: From December 2009 to December 2010
- Research targets: Plant factories and related enterprises and research institutions in Netherlands, and leading domestic plant factories and related enterprises in Japan
- Research methodologies: Face-to-face interviews with relevant personnel by expert YANO researchers, supplemented by literature researches

<What are plant factories?>

A plant factory is a facility in which all the environmental elements for plant growth, such as lighting, temperature and humidity, carbon dioxide density, culture solution and so forth are artificially controlled for year-around, scheduled production of plants and vegetables. There are 3 types of plant factories, one with complete artificial lighting in a totally-enclosed environment, another with combined use of solar and artificial lighting, and the other with solar lighting alone. Studied in this research are all the 3 types of plant factories in Japan, and 2 types of plant factories with combined use of solar and artificial lighting, and solar lighting alone in Netherlands.

◆ Key Findings

• **Large-scale plant factories with high year-round crop yields achieved in Netherlands, an advanced country in plant factory industry**

Plant factories in Netherlands are highly developed facilities including large-scale glass panel green houses, where scheduled, year-round production of vegetables is realized. High productivity has been achieved with highly developed production technologies. Main vegetables being raised are tomato, paprika and cucumber, which account for 90 percent of the total vegetables produced in the plant factories.

In the plant factory industry in Netherlands, industrial clusterization and regional integration of plant factories are advanced. There are much differences in many aspects of the industry compared to Japan, such as lower initial and running cost, larger-scale of plant factories, introduction of automated and highly advanced equipment, networking and information sharing among the plant factory operators and research institutions including universities, clear assignment of roles between the plant factory operators who are the producer of vegetables and sales/distribution enterprises. In terms of productivity, their yield of tomato is close to 3 times of the yield in Japan.

• **Plant factory market in Japan is on track for growth**

The market size of Japanese plant factories (in value of the shipment of vegetables) in fiscal 2009 was 13.826 billion yen. All the segments of plant factories, with complete artificial lighting, combined use of solar and artificial lighting, and solar lighting alone, have been growing in general, and are expected to grow steadily, reaching 31 billion yen in fiscal 2015, and 64 billion yen in fiscal 2020.

◆ **Report format:**

Published report: “Next Generation Agri-production System Market 2010”

Issued in: December 2010

Language: Japanese

Format: 182 pages in A4 format

Price: 130,000 yen (6,500 yen of consumption tax shall be charged for the sales in Japan.)

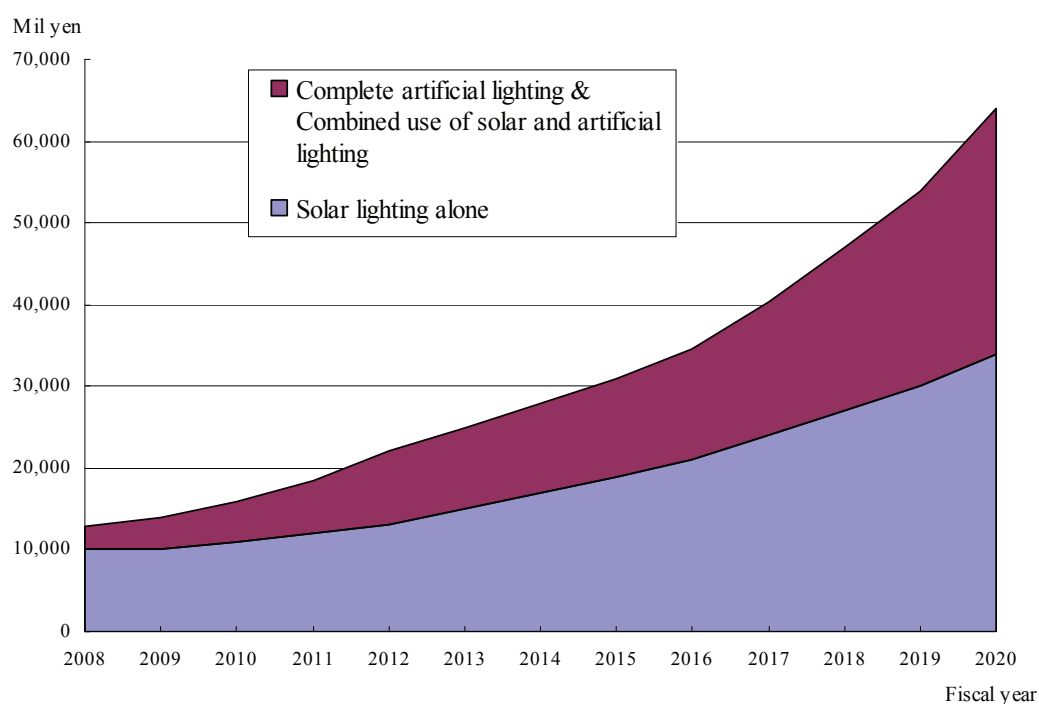
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Fig. 1: Forecast on the Plant Factory Market Size in Japan



Estimated by Yano Research Institute

Unit: Million yen

	FY 2009	FY 2015 (Forecast)	FY 2020 (Forecast)
Complete artificial lighting & combined use of artificial and solar lighting	3,862	12,000	30,000
Solar sighting alone	10,000	19,000	34,000
Domestic plant factory market size (Total)	13,862	31,000	64,000

Estimated by Yano Research Institute

Note 1: Based on the vegetables shipments in value

Note 2: In case of solar lighting alone, only the facilities with the total green house space not smaller than 1ha, with multiple environment control systems are included.

Note 3: Figures for the years after fiscal 2010 are estimates