Thinking Sustainable Future

Ideas on sustainable future corresponding to globalization

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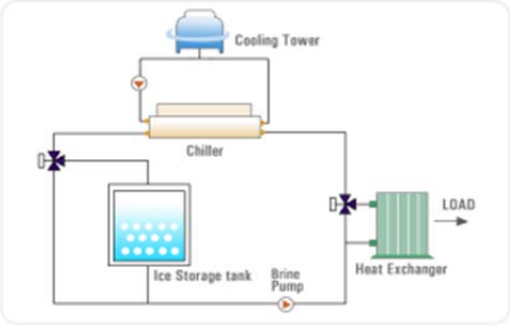
  - India 2100: Towards Radical Ecological Democracy

Part 1: Visit to Tokyo Denki University ①

- Ice thermal storage system:

For making hot water and ice by night electric power; the stored heat will be used for daytime air conditioning and so on.



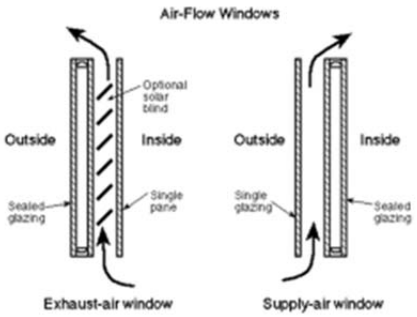
Part 1: Visit to Tokyo Denki University ②

- Air conditioning:

By changing the intensity of the blowing wind from the air conditioner, body temperature of a human being is expected to decrease.

- Airflow window system:

The exhaust air of room passes through double-glazed windows which prevents heat from outside.



Part 2: Lecture on plant factory

(Given by Prof. Maruo from Chiba University in Mayekawa MFG. Co.,Ltd.)

Plant factory:

Especially in the field of horticulture, based on the monitoring of the environment and growth of plants, these facilities are able to plan the life cycle of products such as vegetables, by performing an advanced environmental control and growth forecast.

There are mainly 3 types of plant factory:

1) Solar energy type

2) Combination type (solar and artificial lighting)

3) Artificial lighting → Increase of water and CO_2 utilization efficiency

2.1 Merits of plant factory

Merits on yields:

Three-dimensional, multi-layered ——— Greatly increased production per land

Enable environmental control ——— Stable harvest can be achieved without being affected by the temperature or soil

Merits on resources:

Appropriate fertilizer management ——— Reduce environmental impact

Enormous consumption of CO_2 ——— Possibility of being the acceptance destination of CO_2

Merits on society:

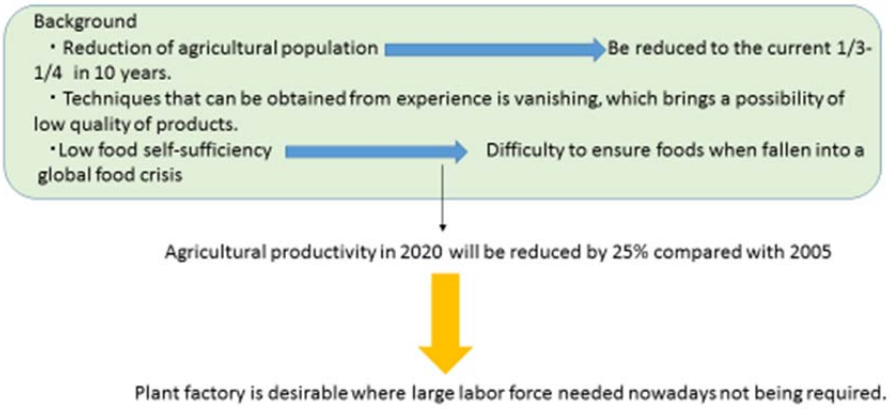
no restriction on the location ——— Participation in agriculture can be achieved without farmland;

——→ Become a supply means of food and vegetables in places with difficulties in agriculture: Antarctica and in the deep-sea vessels

.....Other merits.

写真１　千葉大学拠点のレタス生産システム
（株みらい の10段栽培システム）

2.2 Necessity of plant factory



2.3 Tasks of plant factory

Two main tasks of plant factory:

1) Diversification of possible cultivated varieties

- Currently, varieties of fruits and vegetables are limited to such as tomato and paprika.
- Necessary to develop varieties that are suitable for plant factory.

2) Necessity of enormous amount of energy

- To secure a large amount of energy for the environmental control of the air-conditioning and light source which is carried out by machine.
- Need of cooperation with the energy industry.

2.4 Connection of plant factory and sustainable future

Sustainable future：

A society that meet the interests and demands of future generations, as well as satisfying the desire of the modern generation, where the environment and development can coexist, by moderate development in consideration of environmental conservation.

Since plant factory has the characteristics as below:

1) Stably producing crops without being affected by changes in the environment

2) The energy efficiency is high despite the large amount of energy use

3) According to the appropriate usage of fertilizer and management of CO_2 usage, the environmental load is reduced.

It meets the demands of creating a sustainable future well.

Part 3: Group discussion①

—— ideas about sustainable future (2060～2080)

Background

Globalization → living in various environment
investigating personal comfortable life

Contents

Comfortable area → developing a personal air conditioner

Problem

Needing energy
The source of supply of the energy from the sun

Group discussion ②

——Residence on boats:

- Background:

1. The increasing proportion of the sea due to global warming;
2. The growing population

- Contents:

1. Use of natural energy;
2. Maximized use of electricity by the gained energy

- Prospects:

Better environment for creatures to live

Supplementary literature review: India 2100: Towards Radical Ecological Democracy

Status of India:

- On a steep path of ecological unsustainability;
- Peoples' initiatives at sustainable and equitable well-being in various sectors are growing, and some policy shifts have taken place in this direction.

Building on this, an alternative framework of well-being——

Radical Ecological Democracy

can be envisaged.

India 2100 Radical Ecological Democracy (RED)

- Framework and principles of RED:

1. Framework:

   (Human well-being; ecological sustainability; human equity)

2. Principles:

1) Ecological integrity and limits
2) Equity and justice
3) Right to meaningful participation
4) Responsibility
5) Diversity
6) Collective commons and solidarity
7) Rights of nature
8) Resilience and adaptability
9) Subsidiarity and ecoregionalism
10) Interconectedness

Is such a transformation possible?

- Although the author admits it perhaps seems utopian, the author claims there are many signs that a transformation is possible over the next few decades, including:

1. Growing civil society mobilization to resist elements of the dominant economic growth model
2. Civil society facilitating basic needs
3. Policy shifts and reforms
4. Technological shifts
5. Financial measures
6. Awareness, education, capacity

Concluding Remarks

- The visit to Tokyo Denki University:

  Recognize that effort made on the design of management system which contributes to the energy conservation and environmental protection.

- Lecture on plant factory:

  Suggest the possibility of a sustainable future, with consideration of the environmental issues.

- Communications with researchers from different universities and companies:

  Exchange of ideas and creativity challenge.

- Literature Searching :

  For a deeper exploration of sustainable future.