

June 3, 2016

Tokuron-1/IPADS Development Studies(2016)

Agricultural Engineering-

Production system, Infrastructure, Irrigation-

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Question-1

Pre-homework from Mizo.

What is your favorite rural landscape?
Select one photo from the Internet,
and explain the reason why you like it.

1. [Download answers from Webpage.](#)
2. Introduce your answer in your group.
3. Choose one picture from your group.
4. Explain why the picture is chosen.

- Group discussion (10 min)-

Question-2

1. When did the rural landscape appear?

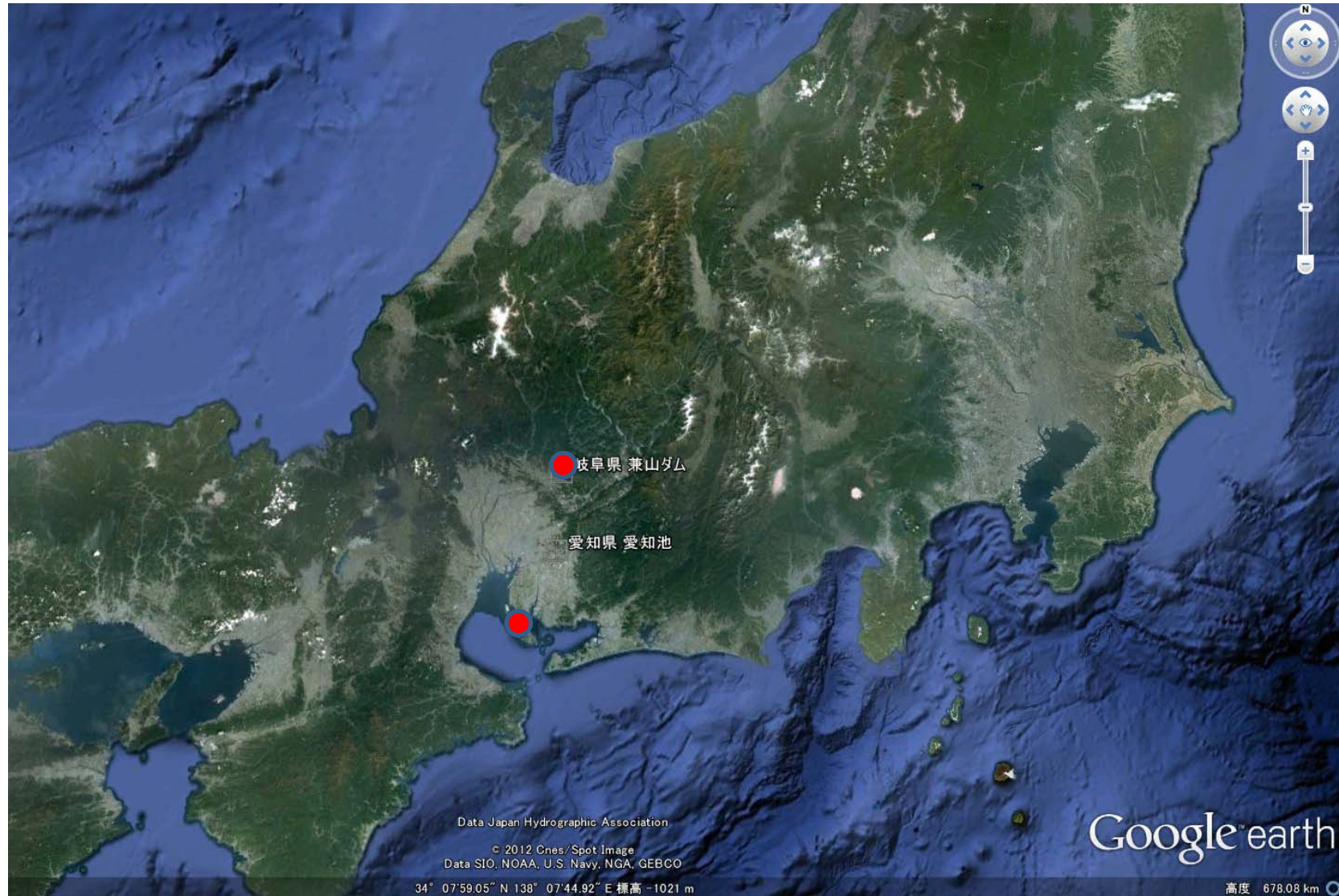
2. Who made the rural landscape?

- Group discussion (5 min)-

What is this?



TOYOTA is leading Japan ?



Before the Project

1) Frequent droughts

With no perennial river to draw water from, farmers would depend on unpredictable rainfall and numerous ponds.



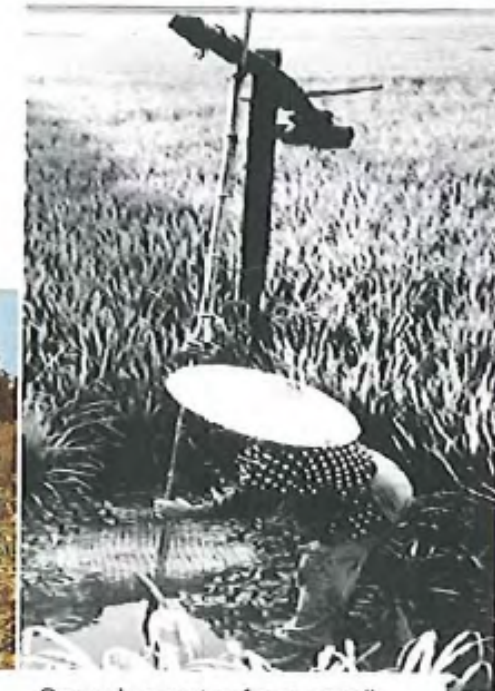
13,000 ponds in 33,000 ha of the project area



Watching on the night



Watering with a dipper



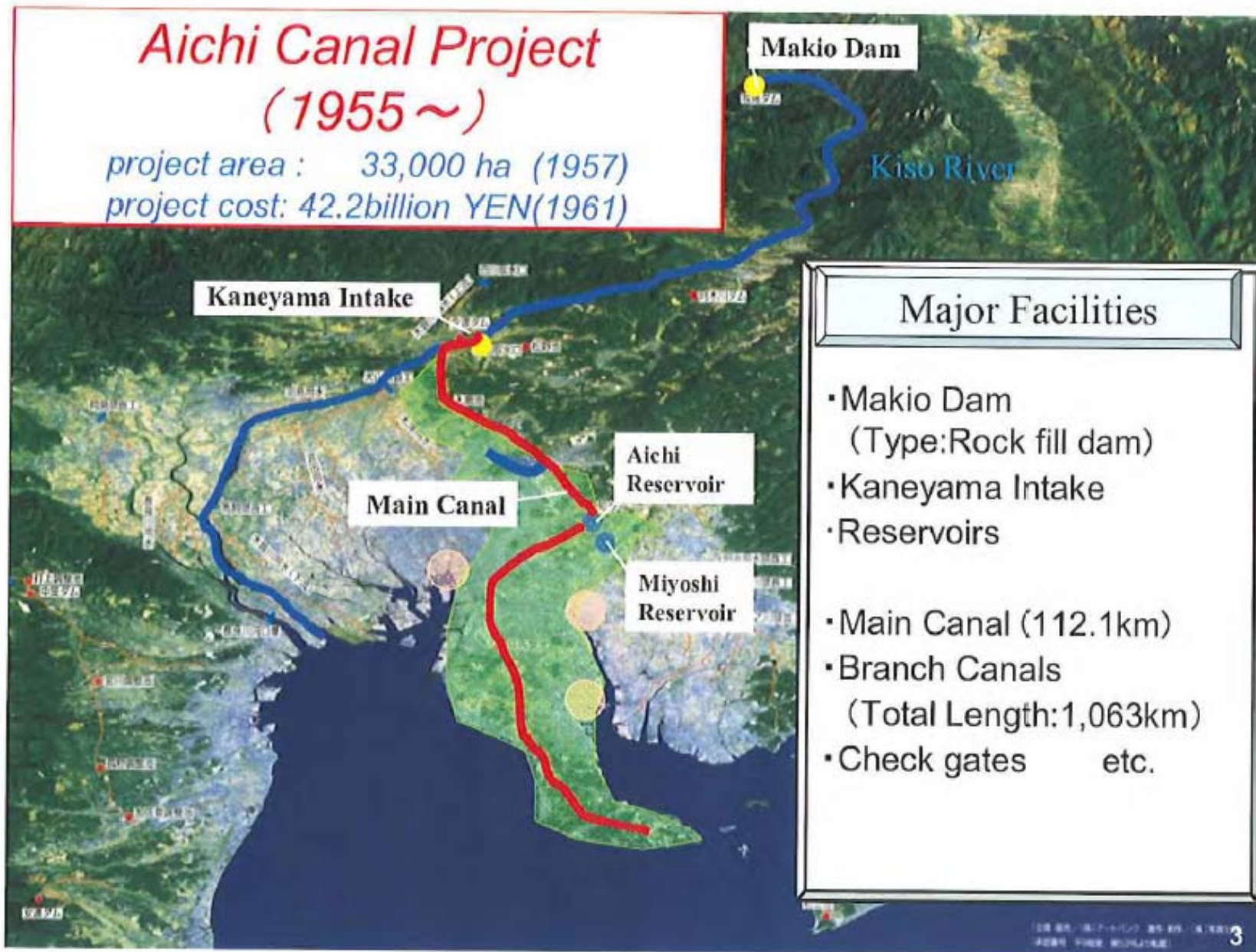
Scooping water from a well

Question-3

Why did this area develop?

Who developed this area?

- Group discussion (5 min)-



After the web page of 愛知用水総合管理所

Project-X

Water of life: conquer the wild river,
Aichi Canal Project
(2002.11)

The Kiso-river is one of three biggest rivers in Japan. 300 ton/sec water crushes rocks and cut the cliffs. The Kiso-river is called a rampage river. 45 years ago, a Japan's largest project began which damming the river and build a dam. Destination to send the water is the Chita Peninsula far away of 120km where was the parched earth. There was no river watering the fields, a large drought struck at a frequency of once every three years. Water was life for 220,000 people who lived in this area.

Two men struggled to change this area in lush earth : one was a teacher who returned from China after world war second and the other was a kind-hearted man who is called the Buddha.

It became to unprecedented flame construction. Poisonous volcanic gas was ejected. By cave and landslide, many construction workers died one after another. This is the moment that the rampage river peeled fangs.

This film is a fierce drama of men who threw all out and bet their lives to get "the water of life".

Theme music of this film

地上の星

歌: ERIC MARTIN 作詞: 中島みゆき/英語詞: Joe Inoue 作曲: 中島みゆき

A Glimpse of Pleiades in the breeze
In the wind is a sandy universe
All of our heroes have disappeared
Never had the chance to get what they deserve
Out in the field is a Pegasus
Venus on the corner of a street
Tell me where have all the people gone
Never had the chance to get what they deserve
All of us have seem to forgotten
The stars that we have on earth
None of us can help but gaze into the sky
Tell me, swallow (A)
What do you see from above?
Where is the light? The stars we have on our land
Tell me, swallow
Where have the glory gone?
Where have all the stars
On earth, on our planet gone?

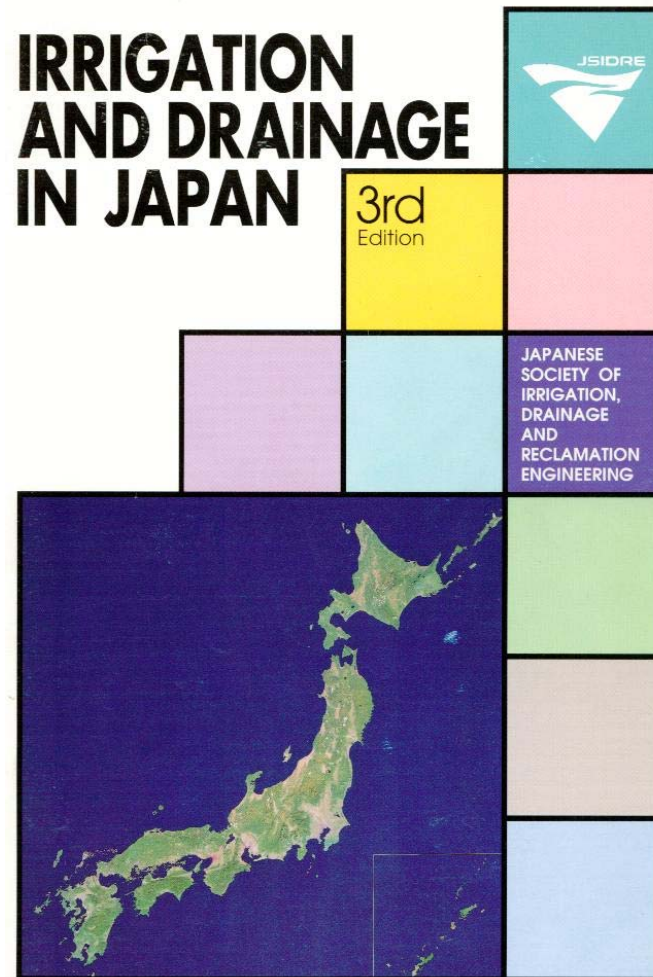
On a cliff I can see Jupiter
Under the water is a Sirius
All of our heroes have disappeared
Never had the chance to get what they deserve
Running after fame and glory
The result is a same old story
People and up grasping ice and they shiver
Tell me, swallow
What do you see form above?
Where is the lights? The stars of our planet
Tell me, swallow
Where have the glory gone?
Where have all the stars
On earth, on our planet gone?

Running after fame and glory
The result is a same old story
People and up grasping ice and they shiver
A Glimpse of pleiades in the breeze
In the wind is a sandy universe
All of our heroes have disappeared
Never had the chance to get what they deserve

(repeat A)

Land Improvement Projects

(土地改良事業／農業農村整備事業)



JSIDRE (1995)

Definition of land improvement projects in Japan

- MAFF(Ministry of Agriculture Forestry and Fisheries) is responsible for projects to cultivate virgin land, develop agricultural land, consolidate agricultural land plots or construct irrigation and drainage facilities
 - including reservoirs, barrages, pump stations, canals, etc. for improving agricultural productivity
 - constructing infrastructures in rural areas as community roads, domestic water supply systems, sewerage systems
- Such projects are called
 - (土地改良事業)“Tochi Kairyo Project Systems“= “Land Improvement Project Systems”
 - (農業基盤整備事業)“Nogyo Kiban Seibi Project Systems“= “Agricultural Infrastructure Improvement Systems”
 - (農業土木事業) "Nogyo Doboku Project Systems" = "Agricultural Civil Engineering Project Systems"

Land Improvement Project (1)

(土地改良事業)

- Land improvement projects are carried out under a law called **the Land Improvement Law**. (土地改良法)
- This law was initially enacted and enforced in **1949**.

Purposes and Benefits:

- (1) increase land and labor productivities (土地・労働生産性)
- (2) increase total agricultural production(収量)
- (3) improve the agricultural structure by diversification
(多様化による農業構造改善)

Land Improvement Project (2)

Menu of land improvement:

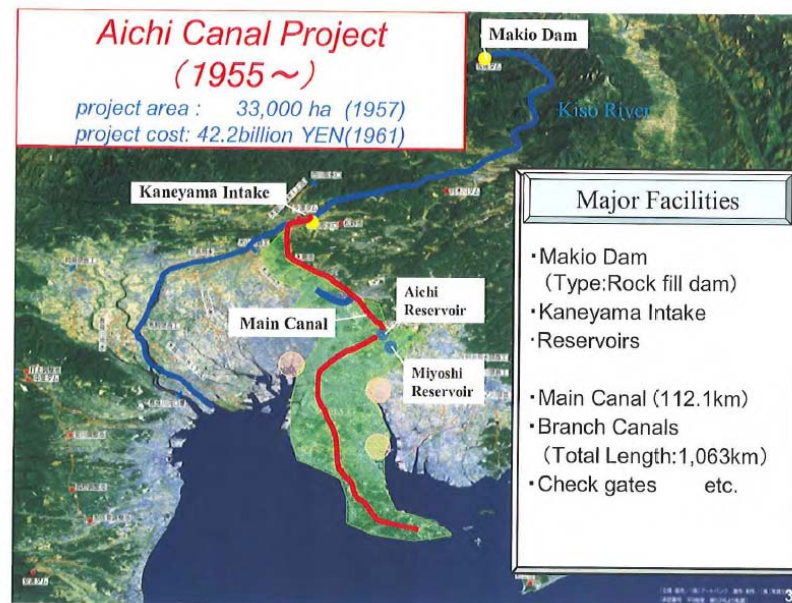
1. Irrigation and drainage (かんがい排水)
2. Agricultural land consolidation (圃場整備)
3. Farm and rural roads (農道)
4. Comprehensive development of non-paddy agricultural land (水田以外の農地総合開発)
5. Comprehensive development of rural areas (農村総合開発)
6. Disaster protection (防災)
7. Reclamation of agricultural land (開拓)
8. Reclamation from sea or lake bottom (干拓)

Characteristics of Land Improvement Project in Japan

- **Various menus** are provided in term of contents and benefits of facilities
- The main body to implement a land improvement project is either the national government, a prefecture, or a **Land Improvement District (土地改良区)**
- The costs of land improvement projects are paid by the **beneficiaries (受益者)**
 - Part of the costs is paid by **the farmers** who are the direct beneficiaries
- Facilities to be constructed by projects of the same type have to be **standardized** throughout the country
- "**Cost Benefit Ratio**" (BC Ratio) is used as the criterion to judge the economical feasibility of land improvement projects

Question-4

Why were not only “canals” but also Makio Dam constructed in Aichi Canal Project?



- Group discussion (5 min)-

Water rights

progress of urbanization and diversion of water rights

- The economic growth and progress of urbanization have caused diversion of a large number of paddy fields into housing, office or factory land lots.
 - As a result, it was thought best to divert some of the water for irrigation to water for the newly born cities.
 - In Japan an approval from the Ministry of Construction has to be obtained under the **River Law** to divert water rights.
- Diversion for irrigation prior to 1896 when the River Law was enforced was considered **a traditional water right (慣行水利権)**, already approved at the time of enforcement.
 - The water rights of irrigation groups with a long history have been legally recognized.
 - In view of the definition under the River Law that river water is a public asset, irrigation groups are prohibited to directly sell their water rights to cities



溝口勝
@msrmz

整然とした有明海の干拓水田。これも農業土木の作品。着陸なう。



1

リツイート



13:25 - 2015年10月23日

Orderly Ariake Sea reclamation paddy. This is also work of Agricultural Engineering. Landing Now. (2015.10.23)

Question-5

Why are Japanese paddy rectangle shape with same size?

- Group discussion (5 min)-

An aerial photograph of a rural landscape. A winding river flows through the center-left of the frame. The surrounding land is a patchwork of green and brown fields, with some areas appearing to be under construction or recently cleared. In the upper right, there is a small, dark blue pond. The overall scene depicts a typical agricultural or semi-rural environment.

Land Consolidation Project (圃場整備事業)

Standard Plot Size (標準区画)

- From around 1965, a plot of 0.3 ha (3反区画) has been considered a standard size for paddy land consolidation projects.
- Basic size is 100 meter long and 30 meter wide. With a farm ditch, farm drain and farm road along the shorter side.
- However, land consolidation projects have started to make plots of at least 0.5 ha in order to use farming machinery more effectively and also in order to improve capital and labor productivities.

Standard Paddy Field Layout after Consolidation

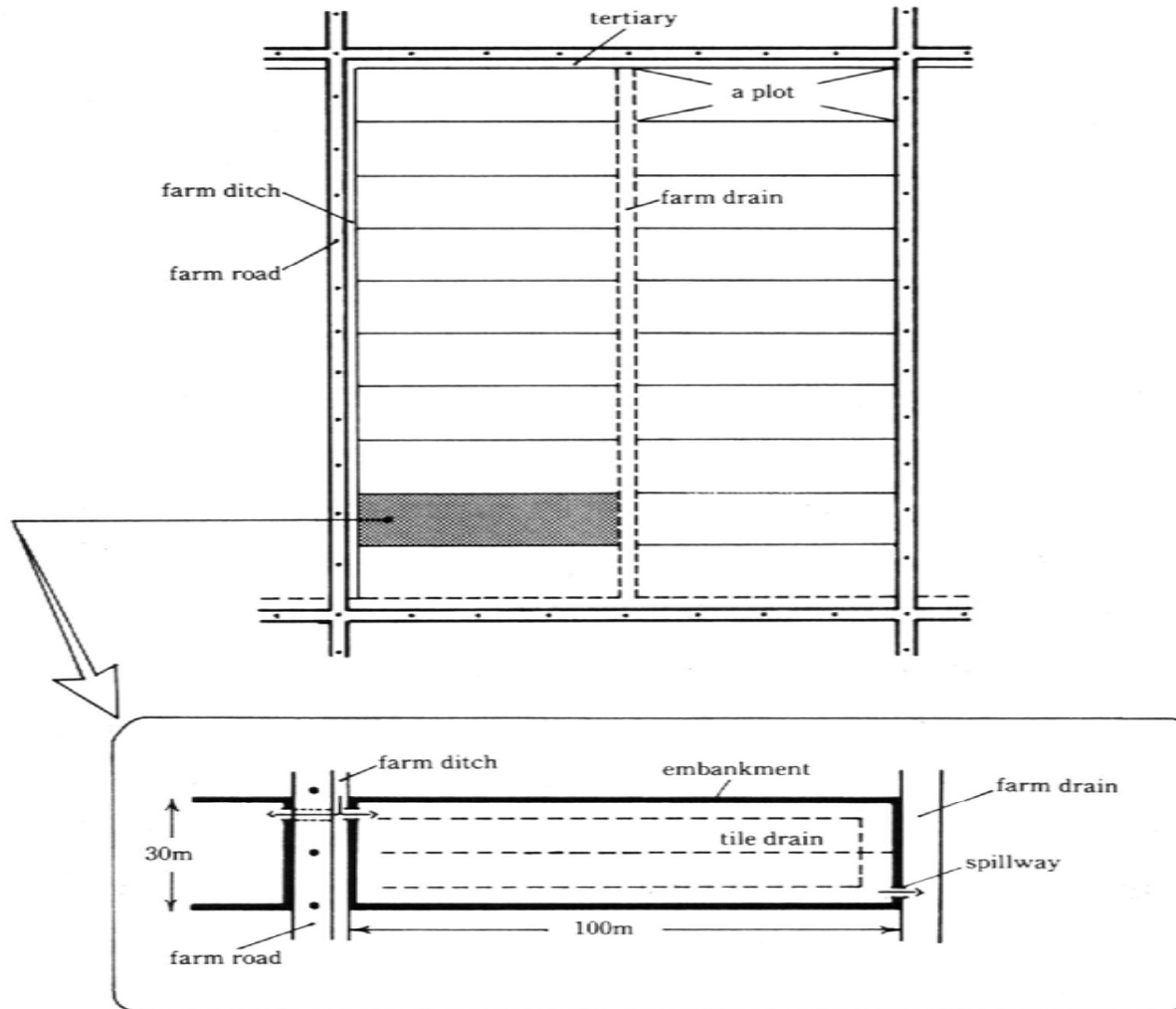


Figure 7 Standard paddy field layout after consolidation.

Conclusions

- Agricultural Infrastructure Improvements are public work projects 農業基盤整備は公共事業
 - Application projects 申請事業
 - Need Consensus building 合意形成
 - Take a long time 時間がかかる
- The Spirit of Agricultural Engineering 農業土木の神髄
 - Comprehensive agricultural development technology 総合的な農業開発技術
 - Management of soil and water 水土の管理
 - Improvement of QOL supported by the technology 生活の質の向上
 - Interaction between urban and rural areas 都市と農村の交流

There are a lot of human dramas behind our improved land.

Agricultural engineering for Reconstruction

- Prof. Hidesaburo Ueno
 - Owner of Hachiko dog
 - Professor at Univ. of Tokyo
 - Law of Land consolidation(1900)
 - Lecture of Land consolidation (1905)
- **Agricultural engineering**
 - Infrastructure of food production
 - Barren land to fertile farmland
 - Land reclamation
 - Irrigation and drainage
 - **Farmland decontamination**
- **Land use after decontamination**
 - Rural plan after villagers return



(2015.3.8)

Project-Z for Fukushima

Agricultural Infrastructure has been accomplished by unknown Challengers!

(2013.12.19) [Decontaminating Fukushima: Cleaning up Farms](#)(NHK WORLD)

(2015.3.3) The Rebirth of Fukushima ([D](#), [H](#), [S](#))



References 参考文献

- [http://www.water.go.jp/chubu/aityosui/a\(jyouhou-sub\)/06\(english\)/a_06.html](http://www.water.go.jp/chubu/aityosui/a(jyouhou-sub)/06(english)/a_06.html)
- [IRRIGATION AND DRAINAGE IN JAPAN \(3rd Edition\), International Affairs Commission of The Japanese Society of Irrigation, Drainage and Reclamation Engineering \(1995\)](#)
- [IRRIGATION AND DRAINAGE IN JAPAN PICTRAL\(3rd Edition\), International Affairs Commission of The Japanese Society of Irrigation, Drainage and Reclamation Engineering \(1995\)](#)
- <http://suido-ishizue.jp/>

June 3, 2016

Summary of the lecture for your future

Masaru Mizoguchi

Our challenges in this lecture

- Objectives
 - Level the knowledge of various students in department of Global Agricultural Sciences
 - Learn how to solve the actual problems
- Method
 - Give English lecture
 - Put fundamental concepts
 - Discuss in group
 - Check your understanding by reports
- Result
 - ??

Challenge to solve the problems that lie in front of us

- What is the problem?
 - Find and set the right question
- How do we solve the problem?



Project-Z by Mizo

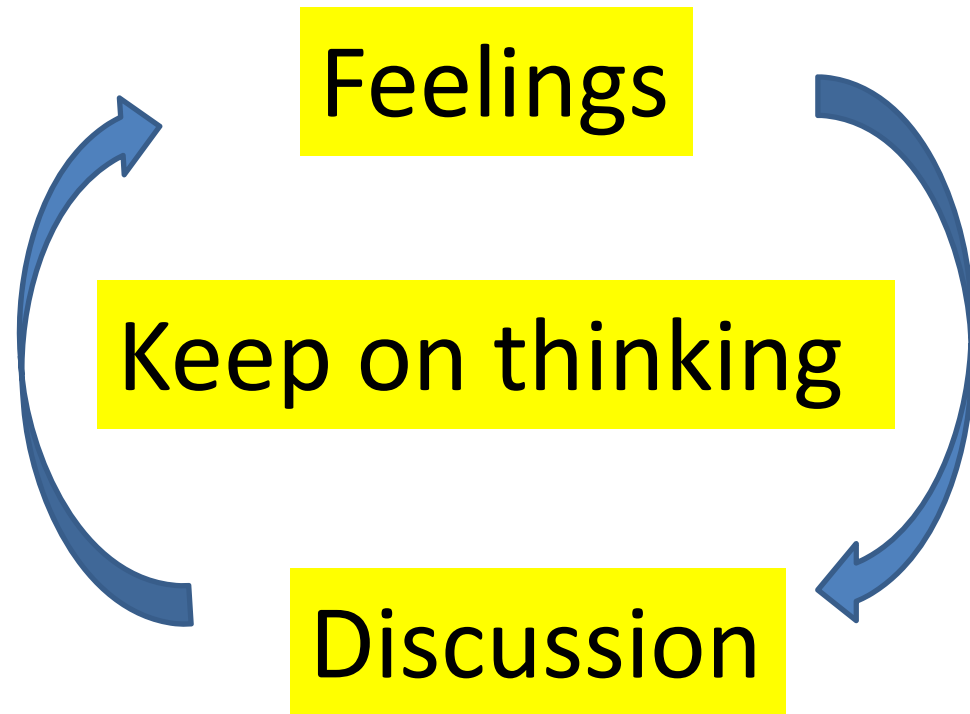


Theory and Practice

- Notice the gap between theory and practice
- Understand the theory (Science)
 - Mathematics, physics, chemistry, biology, ecology,,,
 - Sociology, economics, political science,,,
- Know the practice (experience)
 - Field survey, interview, job training, internship,,,,

Where does the idea come from?

- Lecture?
- Book?
- TV?
- Internet?
- Practice?



Report

Discuss this lecture

- good point
- bad point

Deadline: June 10, Friday

To: report@iai.ga.a.u-Tokyo.ac.jp

Tentative schedule in A1-A2 semester

- Sep.30 Fri, Guidance (Grouping)
- Oct. 7 Fri, Special lecture by [NTC International Corporation](#).
- Oct.14 Fri, Presentation on research action plan before comments by professionals (10-min presentation + 5-min Q&A)
- Dec.9 Fri, Deadline of draft report to advisors
- Dec.16 Fri, 14:55-18:35 Presentation (20-min presentation + 10-min Q&A, in English), [Score sheet](#)
- Dec.22 Thu, Deadline of [final report](#) to report@iaiga.a.u-tokyo.ac.jp