

Summary

In the 25 Official Development Assistance(ODA) Comparative Advantage sector program designated by Korea International Cooperation Agency(KOICA), rural development project and agricultural water securing program are included in the key programs and in the general programs respectively. This means that Korean model agricultural water development program can occupy superior position as compared to other donor countries and effect of aid project can be enhanced by applying Korean model in the recipient countries.

To drive Korean model for agricultural supply and management aid program successfully considering complicated international situation, and status of donor countries and recipient countries, framework development including drive strategy and execution process is required. Therefore, in this study, it is intended to set up direction of aid program to meet new paradigm by developing a framework to drive agricultural water supply and management aid program, and by applying this model in the evaluation of completed projects at the same time using developed framework and sub modules required for the execution of project.

In the Chapter 2, various statistics and international indices related with agricultural water and water resources that can indirectly evaluate the agricultural environment and water resources environment of recipient countries are provided. Projected statistics and indices are as below;

- Renewable Water Resources of each country
- Water Poverty Index(WPI) of each country
- Total Irrigated Area in the world
- Agricultural water use of each country

The above indices are provided with ranks of major aid countries in

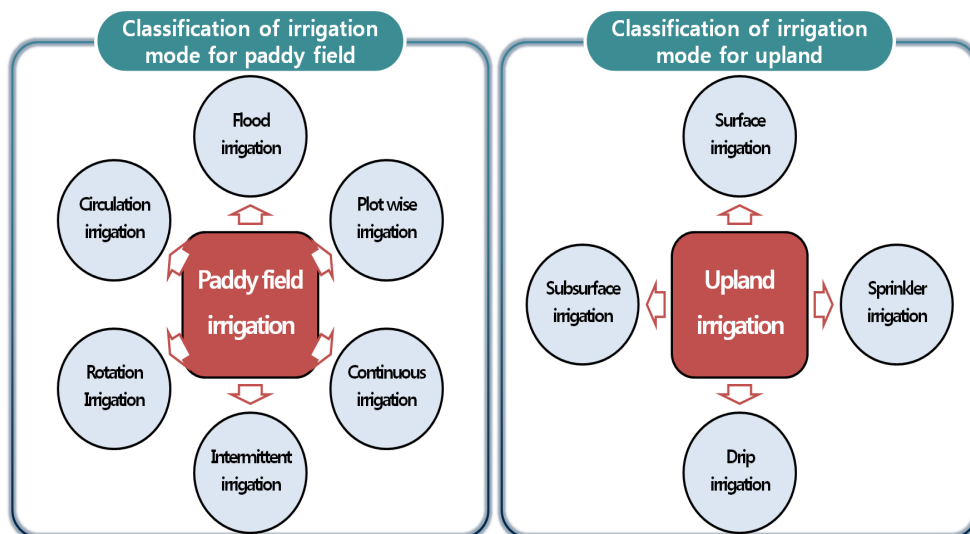
KOICA program. Also, by providing the indices of the recipient countries supported by KOICA like,

- Major crop cultivation amount of each country
- Crop calendar for major crops
- Required water for crop cultivation

status of recipient countries, agricultural environment, and urgency of the project can be briefly evaluated.

Besides, technical terms are explained along with figures so that project managers of KOICA can understand technical terms related with agriculture, and classification of irrigation, drainage types for paddy field along with definition of irrigation and drainage were explained.

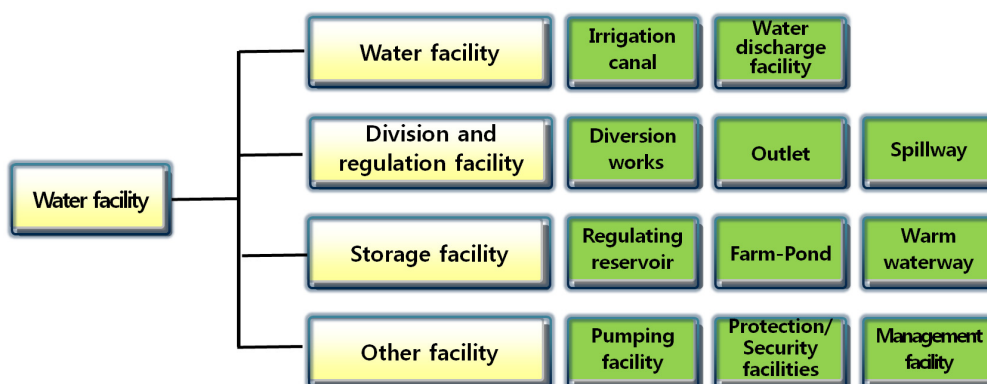
- Classification of irrigation type



Along with terminology, types of water supply facility required for agricultural water supply are explained and by explaining the water source and water source facilities for agriculture in detail, terminology and

systematic classification throughout the agricultural water related facilities are explained to help better understanding the subject.

– Classification of water facilities, diversion and regulation facility, storage facility, and other facilities



As sources for agricultural water, rivers, reservoirs, lakes, ground water, and pumping stations can be utilized, the merits and drawbacks of these water sources are described.

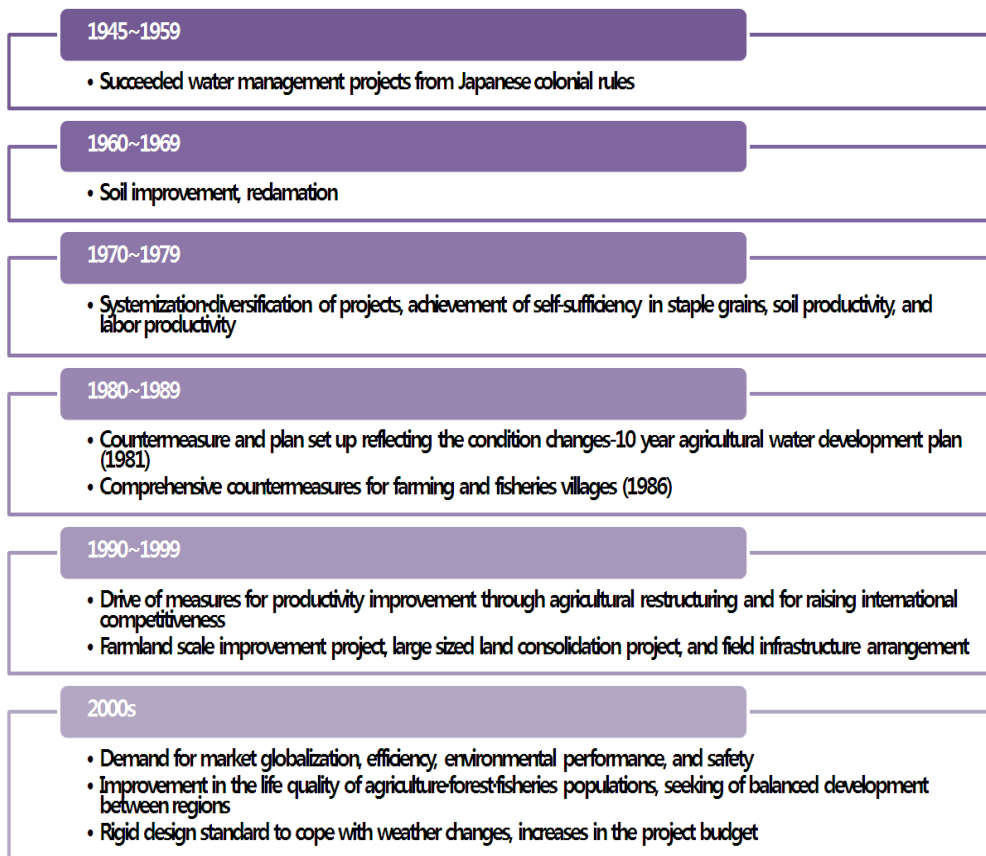
In Chapter 3, recent trends about international aid project as well as international aid project participated by Korea are investigated, also international aid project related with agriculture and achievement by agricultural water related aid by KOIC are provided.

Besides international organization in association with agricultural water, the mission and objectives of each organization are introduced in the following Chapter.

	Food and Agriculture Organization		Secretariat of United Nations Framework Convention on Climate Change
	Global Water Partnership		Stockholm International Water Institute
	International Commission on Irrigation & Drainage		United Nations Economic Commission for Africa
	International Fund for Agricultural Development		World Food Programme
	International Grains Council		World Meteorological Organization
	International Water Management Institute		World Water Council

Especially, by examining the aid result of 14 agricultural water related aids programs that were performed by KOICA in recent years, this research arranged project detail and experiences and lessons through completion of project and shared difficulties and the points to be improved gone through during project execution in detail.

In the Chapter 4, domestic foundation for the aid of agricultural water supply and management is analyzed and provided. For that, agricultural water development process from year 1940s till year 2000s is discussed.



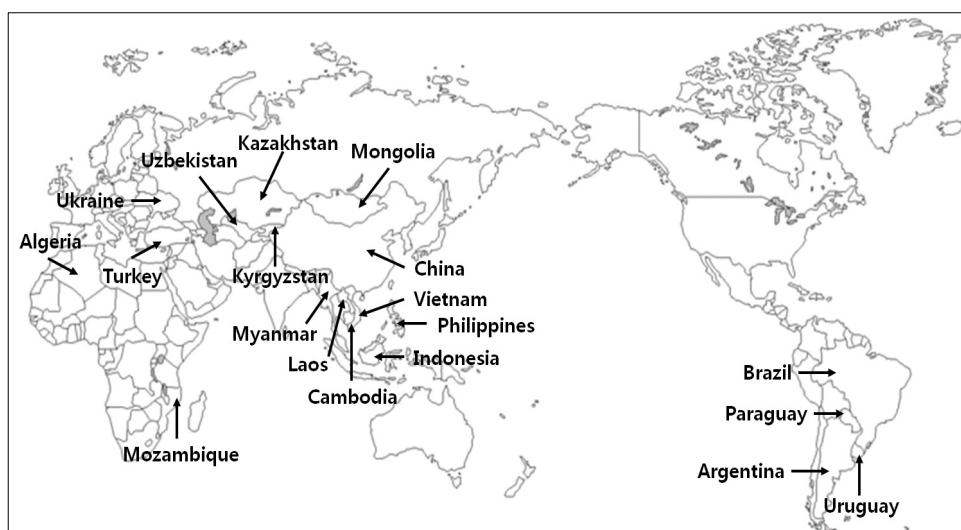
By providing the analysis for the achievement of agricultural infrastructure project of Korea, effect of agricultural infrastructure project, and actual invest outcome on agricultural infrastructure project, the history of agricultural environment improvement project in Korea as well as domestic infrastructure for overseas aids are analyzed and presented.

Also, ranks of domestic engineering, construction, and agriculture related industries and construction industries that can drive overseas agricultural water related project are investigated as of year 2011 and proposed to indirectly evaluate their capabilities as PMC vendors.

In Chapter 5, latest irrigation technology suiting to agricultural

environment of recipient countries are analyzed and suggested. For that, agricultural environment of each country focusing on the major aid subjected countries by KOICA are investigated and provided in detail.

- Subjected countries for agricultural environment survey



Besides, irrigation technologies suiting to agricultural environments of aid subjected countries are investigated and proposed.

- ① Appropriate irrigation technology for the internet provided countries
 - Mixed type agricultural water management technology
 - Real time monitoring of vineyard environmental data and vineyard management
 - Smart irrigation system using Wireless Sensor Network(WSN)
 - Water resources management using internet based virtual water system
 - Horticultural crop management using WNS
 - Development of testing and measuring equipments for effective agricultural water resources management
 - Flow measurement using PDA(Personal Digital Assistant)

② Irrigation technology suiting to water shortage countries

- Low energy water management technology
- No power automatic floodgate
- Automatic water supply inlet for irrigation
- Measurement of reservoir capacity using autonomous navigation and unmanned prober
- Saved water irrigation in the paddy fields
- SRI(System of Rice Intensification) cultivation
- Water saving by soil reduction of green manure crops
- Water saving irrigation in the paddy fields
- Cultivation method for farming cost saving
- Water saving irrigation in the upland

③ Irrigation using alternative energy

- Water management using solar energy
- Solar energy power generation types
- Solar Energy Flood Gate
- Agricultural water measurement system using solar battery

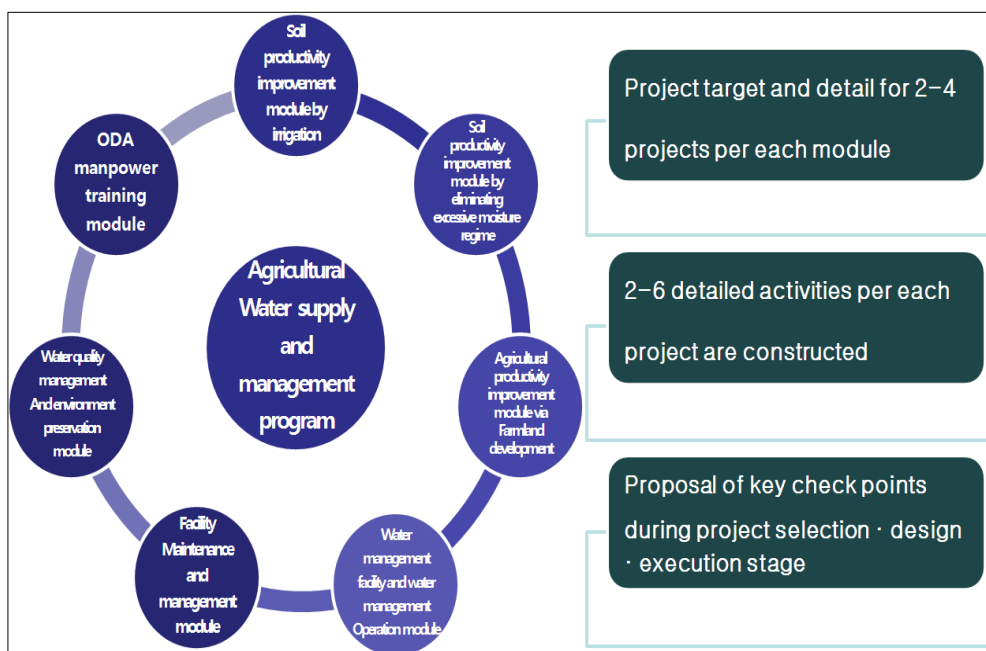
④ Precision farming

- Overview of precision farming
- Current trends of precision farming
- Technology for precision farming
- Application of precision farming

In Chapter 6, framework for the execution of agricultural water supply and management program is developed and proposed. Agricultural water supply and management program is generally a systematic program displayed whole process of planning, design, execution, assessment, and follow up to drive agricultural water development, cultivation land development, drainage improvement, and other projects. Also, program comprises several independent modules, and each model could be a

program of particular project, by combining several modules or activities that construct module program for particular project is enabled to be constructed.

- 7 sub modules in agricultural water supply and management program

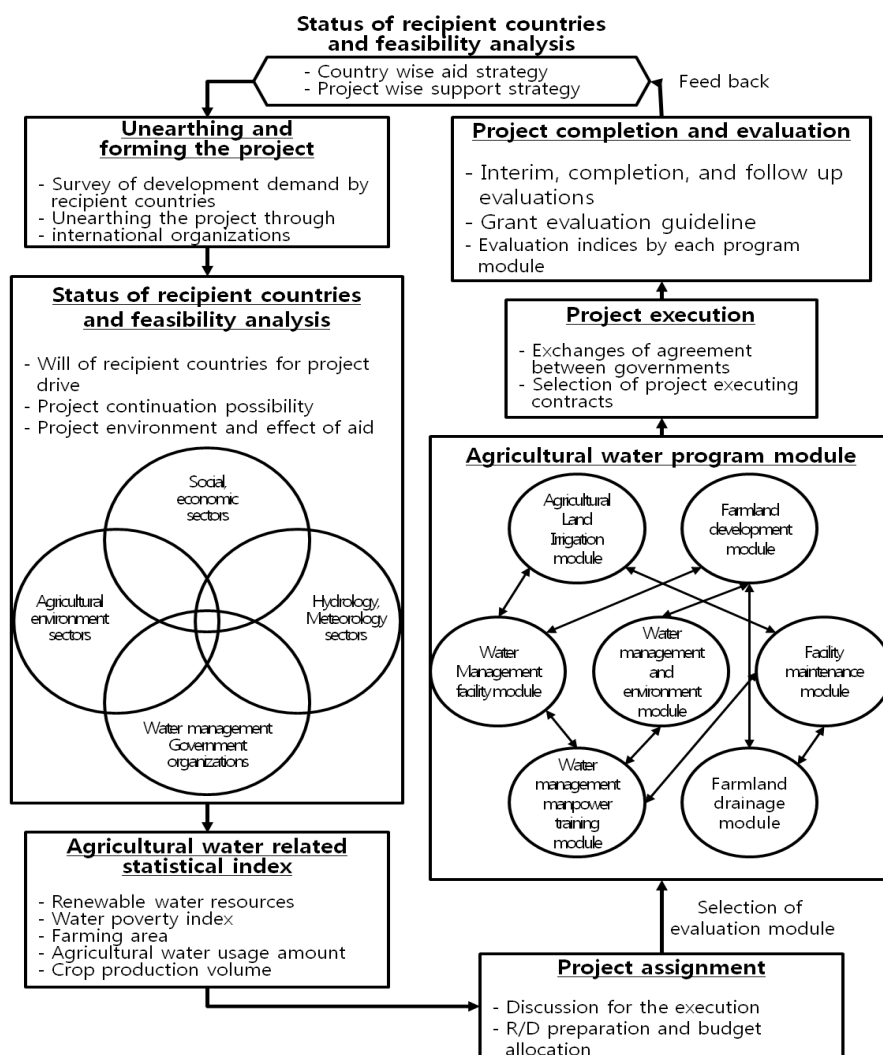


Especially, as a checklist for preliminary survey, natural, environmental, technical, social, and systematic checklist is to be prepared to have sufficient discussion with water resources institutions, in case large scale project is included like dam construction, since compensation and migration, and effect on the environment etc. have to be considered, without enough discussion with water resources institutions, there comes risk of project stop during execution stage after the project kick off.

Therefore, meticulous review is needed during site survey, checklists that are required during feasibility survey and preliminary survey for agricultural water related projects and checklists about 5 categories for

the follow up assessment of agricultural water supply and management project are arranged and proposed.

- Framework for agricultural water supply and management project



In Chapter 7, developed agricultural water supply and management program model was applied in the existing project of KOICA. Among the projects carried out by KOICA, the Dagana, Senegal project is chosen as a sample project, 7 modules can be applied, sub activities are selected to

achieve the same considering the characteristics of project implementing areas. By implementing the selected modules and sub activities, newly developed project summary and Project Design Matrix(PDM) is proposed.