



IRRIGATION DEVELOPMENT IN COASTAL AREA BY APPLYING DRAINAGE WATER: A CASE STUDY IN YOGYAKARTA SPECIAL PROVINCE (YSP), INDONESIA

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There are about to 60 km length and 1 to 1.5 km wide or about to 6000 ha of coastal land in YSR and has great potential to be developed as agribusiness area. By respecting to that phenomenon, in the early of 90's decade, several farmers who live in coastal area of Kulon Progo Regency of YSP developed some irrigated lands in these coastal sandy soil area. This area is only about to 100 to 200 m away from seashore. Development of this irrigated land was begun when farmers found that shallow groundwater has a good quality even to be used as a drinking water. Mostly, farmers use a small individual portable pump to tap the groundwater. Location of YSP is shown in Figure 1 in the Appendices.

Actually, most of farmers who developed the coastal irrigated land have another surface irrigated land nearby. However, since that surface irrigated lands are located in downstream part of irrigation system and have relatively flat topography, most of them are strongly influenced by flood during wet season and vulnerable to water shortage in dry season. By developing this coastal area, hopefully, farmers still have another opportunity to get some benefit of harvested land when these both problems occurred.

When farmers noticed that development of irrigated coastal area give good opportunity, then they develop this irrigated coastal area very intensively and extensively. Following that phenomena farmers in Bantul area, the near by regency of Kulon Progo also developed their coastal irrigated land in the late of 1990's. Even this phenomenon gave some opportunities in developing economic impact to regional development but it was worried that it will create some negative impacts to the environment in the region. The coming up of intrusion is one possibility on that.

Respecting to all of these phenomenon then the Provincial Government of YSP provide some supports to farmers relating to agricultural development of the coastal area in both Kulon Progo and Bantul regencies, respectively. This paper aims to discuss the process of delivery process of supports of Provincial Government to farmers.

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BASIC PRINCIPALS OF DEVELOPMENT

The coastal area will be developed into integrated agribusiness development zones. Some related either sectors or institutions would be encouraged to participate and contribute significant roles in the activities. The main development strategy is utilization of all available resources optimally for various prospective activities in efficient, effective and sustainable manners. The sustainable manner means that there should be a balance between economical development, environment sustainability and human resources development.

DEVEPOMENT STRATEGY

The strategies applied in developing the area are as follow:

A. PROVISION OF RAW WATER

Water is the essential thing for development process. Instead of using individual pumping shallow groundwater, then the government support farmers by constructing reservoir. Since 1999 Yogyakarta Irrigation Project have constructed main irrigation system to supply irrigation water for about 200 hectares in the Regency of Bantul and about 217 hectares in the Regency of Kulon Progo. Scheme of coastal irrigation sysrtem isdepicted in Figure 2 in the appendices. Irrigation water will be made available by diverting from nearest resources, usually; drain or small creek to reservoirs before distributed to cultivation plots by means of piping network and series well system. Fresh water for domestic uses still apply pumped groundwater in limited volume.

B. IMPROVING MARGINAL LAND FOR DRY LAND CROP TECHNOLOGY

Sandy soil in the flat coastal area can be categorized as marginal soil since it lack of organic matter and has a very poor water holding capacity. Improving marginal condition of the soil will intensify cropping management. Low fertility sandy soil will be improved by applying organic manure and artificial fertilizers; spreading mulches on land surface will reduce high evaporation rate. Trees survived to strong and saline sea breeze will be grown near to shoreline to prevent sand dune moving to the cultivated land. Stables built adjacent to cultivation area will produce manure to raise soil fertility.

C. DEVELOPMENT IN INTEGRATED SECTORS

As there are other prospective potentials of the area, then the scope of development is not limited to only agriculture development but also includes fishery (sea fishing, shrimp hatchery), tourism, home industry and others and all should be developed integrally in such a way that the maximal benefit can be obtained. Participation of university and other research center to do related research is encouraged. Improvements of sandy soil characteristic, introducing new high value crops and their post harvest technology and looking for alternative energy to be applied in agricultural development are very essential to be done.

D. DEVELOPMENT OF RURAL MICROECONOMIC SYSTEM

Lack of seed capital and low entrepreneurship are expected as the most weaknesses spots of the local community. A rural microeconomic system then will be developed in the area; rural financial institution ran by local community should be established to manage available financial resources. Training on entrepreneurship as well as introduction to market network are provided by local government staff. Training on other local potential identification and exploitation may also be given to local community.

E. ESTABLISHMENT AND EMPOWERMENT OF FARMERS GROUP

Prior to construction of reservoir, some researches of Gadjah Mada University and local government staff facilitated several dialog with farmers to assess farmer's development need. Dialogs were focused on what farmers need and how they could participate in development process of reservoir construction and its operation and maintenance (O&M) works later on. In that dialog farmers delivered some critics and comments on reservoir design then the Irrigation Project improved the design accordingly.

F. GENDER PERSPECTIVE

The irrigation coastal plain area has been develops in gender perspective approach. All activities in crop cultivation are rest to woman responsibilities since sandy soil is considered relatively light to be cultivated while men go fishing and cultivate their wetland rice field.

IMPLEMENTATION OF THE DEVELOPMENT PROGRAM

The development program consist of the following projects:

A. CONSTRUCTION OF IRRIGATION INFRASTRUCTURES

Main irrigation system should be taken into highest priority, as water is the most essential to the success of the development program. The Irrigation Development Project of Yogyakarta Special Province (IDPYSP) is the one that responsible to do so and since 1999, the Project have constructed main irrigation system to supply irrigation water for about 200 hectares in the Regency of Bantul and about 217 hectares in the Regency of Kulon Prago. The construction of rest 1,580 hectares of coastal area in the Regency of Kulon Progo is postponed due to unavailable fund.

B. PLANTING WIND BARRIER TREES

To prevent cultivated land from being buried by shifting sand dunes, special trees are planted along the shoreline to form a wind barrier. This work is responsibility of Forestry and Plantation Service.

C. DEVELOPMENT OF DEMONSTRATION PLOTS AND RESEARCH CENTER

Crop cultivation on dry and sandy land would require certain technology. The Agriculture and Fishery Service join with Gadjah Mada University develop demonstration plots on dry land cropping that will also be utilized as field laboratories. Some other research center such as Technology Development and Research Agency of Ministry of Science and Technology, Institution of Agricultural Technology Development of Department of Agriculture also set up their own field laboratories in the area. Several result of researches have already been ready to be introduced to farmers.

D. ESTABLISHMENT OF RURAL ECONOMICAL ENTITIES.

Local communities should be motivated to establish rural economical entity, in any appropriate form, so that all economical needs can be accommodated. The most appropriate one is cooperative, but does not exist yet. Any other possibility to do so is Industrial and Trade Service as well as private sector organization (Local Chamber of Commerce), they may be also encourage to take a part as responsible agencies to motivate farmers as well as providing guidance to the community.

E. ESTABLISHMENT AND EMPOWERMENT OF WUA

Since this program is done by participatory approach, there are no any difficulties to impose farmers to establish farmers group, it come from their own awareness. Following completion of irrigation system, local government encourages farmers to establish water user association (WUAS) and then followed by empowerment need assessment. Actually, WUAS is very important to accommodate several works in the post construction of irrigation system and other agricultural development works. Empowerment program such as training, institution strengthening, capital provision and others, may be provided and served by local government. Researches of university have a significant role in design and implementation of empowerment program.

The IDPYSP and other related institution carry out trainings on specific substances. Among others is entrepreneurship and marketing techniques should be put in higher priority. If possible, comparative field trip to other dry land area might be taken into consideration. The IDPYSP is also responsible to strengthen WUA to actively involve in O&M activities just after set up. In the earlier WUA seems have difficulties to collect the irrigation service fee from farmers and this most likely is the most problems such as found in other areas.

F. CONSTRUCTION OTHER SUPPORTING FACILITIES

Other supporting facilities, such as: roads, tourism facilities, fishponds and others, will be constructed later on by related institutions.

G. INSTITUTION REQUIREMENT

Although related institution will responsible in implementing certain project a coordinating body is urgently needed so that all the projects can be implemented

synchronously. Presently the Regional Development and Planning Service is the one that responsible to coordinate all development activities. Table 1 shows kind of development programs and their related responsible institutions.

Table 1. Development programs and the related responsible institution.

No	Institution	Development programs
1.	Regional Planning and Development Service	<ul style="list-style-type: none"> • Coordination body of development program
2	Dept. of Public Works and Regional Public Works Service	<ul style="list-style-type: none"> • Provision of irrigation infrastructures • Construction of roads and other infrastructures • Setting up and strengthening of WUAS
3	Agricultural Regional Service	<ul style="list-style-type: none"> • Guide the farmers on agribusiness based farming activities including choosing profitable commodities, marketing, and others. • Guide local breeders and introducing communal stable system
4.	Regional Animal Husbandry Service	<ul style="list-style-type: none"> • Animal Husbandry development and organic manure production program
5	Regional Fishery Service	<ul style="list-style-type: none"> • Irrigation Fishery • Guide farmers in fish farming and offshore
6	Regional Forestry Service	<ul style="list-style-type: none"> • Planting stripes of trees use for wind barrier to break off shifting sand dune
7	Regional Tourism Service	<ul style="list-style-type: none"> • Coastal tourism development by provision of tourism infrastructures
8	Regional Industry Service and Commerce chamber	<ul style="list-style-type: none"> • Guide local community in developing home industries • Guide and train on entrepreneurship and marketing

H. BUDGET REQUIREMENT

A rough calculation indicates that the development program require a total budget of Rp. 20,300,000,000.00 (twenty billiard and three hundred million rupiah). The budget of all development program cameos from several resources i.e. National Government and Provincial and regencies governments respectively. Table 2 shows the needed budget in roughly.

Table 2. The roughly needed budget of irrigation coastal area of YSR

NO	ITEM	AMOUNT (X Rp 1.000)	REMARKS
1	Construction of Main Irrigation System	12,000,000.00	
2	Agriculture Development	3,200,000.00	
3	Micro credits	3,000,000,00	
4	Survey and Investigation	500,000.00	Including agric.training
5	Training and Institution Establishment and empowerment	1,200,000.00	Roll-over credit
6	Wind Barrier	400,000.00	
	TOTAL	20,300,000.00	

Source: the IDPYSP, 1998

PRESENT CONDITION

Farmers have utilized the system for cultivating various highly value crops such as; chili, corn, cucumber, eggplant and others and get benefits from it although the crop production can be made higher if the farmers adopt appropriate cropping technology. Universities and other research center have already introduced their own result of research, such as developing micro irrigation system, introducing new varieties and crop culture, soil characteristics improvement, application of wind mill for shallow groundwater pumping and trickle irrigation purposes.

One result of development program both areas recently are known as horticulture production center and fish market. District of Bugel in Kulon Progo area is famous with melon and watermelon center production in the area, while Samas is known as one of beach tourism destination and center of onion and shallot production in YSP.

Agriculture organic culture is favorable to be implemented in the area. To do so, stables have been constructed adjacent to the cultivated land, so, farmers can easily make organic manure and directly apply it to the filed and the most important thing villages become healthier as there is no cattle stabled within villages.

The most problem found is the lack of seed capitals either for extending their on-farm irrigation system or purchasing agricultural inputs. Another one is farmers are very dependent to regional market. And they are under weak position, so, they have no power to control market price. To solve the problems the government of Bantul Regency is very often organize agricultural market day during weekend and seems it can help farmers to find good price.

CONCLUDING REMARK

Development of coastal irrigation area in YSP is one success example of collaboration programs done by several institutions. Government both national and regional levels provide fund and some support to empower people. Universities and research center introduce new technology in agricultural development and provide expertise to farmers. However, actually some difficulties very often occur. Implementation of development program by different organization is very difficult to be coordinate since all organizations have their own budget with different management. Even coordination meetings are very often done but the representative person in the meeting always different so decisions are not very easy decided.

APPENDICES



Figure 1. Location of Yogyakarta Special Province

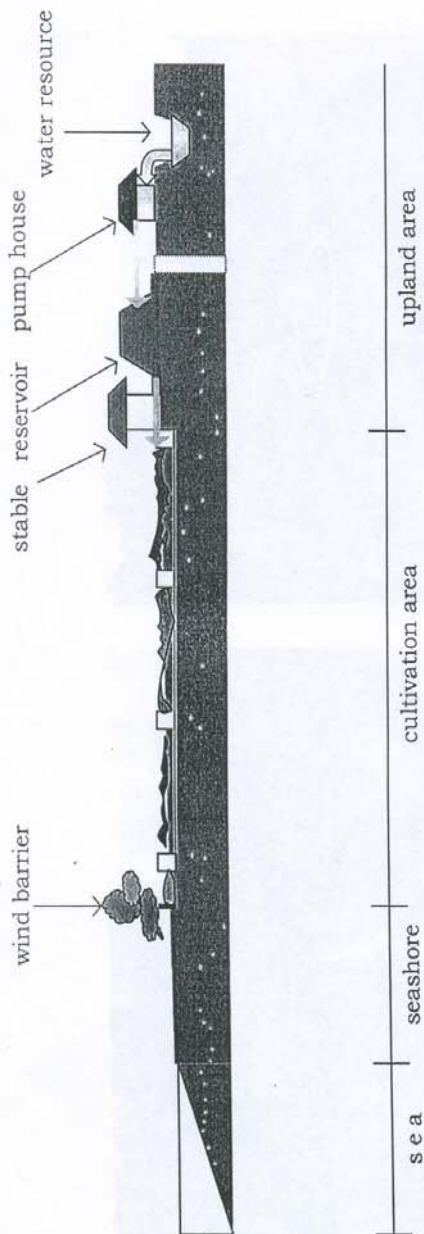


Figure 2. LAYOUT OF THE CULTIVATION ON COASTAL AREA