THE KKU SMALL SCALE WATER RESOURCES PROJECT

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บทความนี้อธิบายถึงลักษณะของโครงการแหล่งน้ำขนาดเล็กของสำนักงานพัฒนาแหล่งน้ำ คณะวิศวกรรมศาสตร์ มหาวิทยาลัยขอนแก่น ซึ่งได้เริ่มดำเนินการมาตั้งแต่ปี พ.ศ.2521 ภายใต้ชื่อโครงการต่าง ๆ กันตามความเหมาะสมของหน่วยงานที่ให้การสนับสนุนทางการเงิน

กิจกรรมของโครงการแหล่งน้ำขนาดเล็ก คือ การสร้างฝายและสิ่งก่อสร้างอื่น ๆ เพื่อบันเทาปัญหาการขาดแคลนน้ำของหมู่บ้านในภาคตะวันออกเฉียงเหนือ ส่วนประกอบส่วนหนึ่งที่สำคัญในกิจกรรมดังกล่าวก็คือการใช้น้ำที่ได้อย่างมีประสิทธิภาพ แนวทางที่ใช้ในโครงการเพื่อนำไปสู่การใช้น้ำอย่างมีประสิทธิภาพนี้ได้รับความสนใจอย่างมากจากหน่วยงานอื่น ๆ เนื่องจากเป็นแนวทางใหม่และมีลักษณะเฉพาะซึ่งแตกต่างออกไปจากแนวทางปกติที่ปฏิบัติกันอยู่ในโครงการของหน่วยงานอื่น ๆ

บทความกล่าวถึงรายละเอียดทางเทคนิคโดยเน้นความร่วมมือจากชาวบ้าน เพื่อนำไปสู่การก่อสร้าง การซ่อมแซมและการใช้งานโดยชาวบ้านเองอย่างมีประสิทธิภาพ หัวใจของแนวทางดังกล่าวนาจะเป็นความรู้สึกเป็นเจ้าของที่ชาวบ้านมีต่อสิ่งก่อสร้าง ซึ่งเกิดขึ้นเนื่องจากแนวทางที่ใช้ ในขณะนี้โครงการฯได้รับความสนใจจากหน่วยงานต่างประเทศหลายหน่วยงาน โดยเห็นว่า แนวทางดังกล่าวอาจนำไปใช้แก้ปัญหาโครงการชลประทานขนาดเล็กอื่น ๆ ได้ ในส่วนของประเทศไทยเราเอง ก็ได้มีความพยายามผลักดันให้มีการเปลี่ยนแปลงในระดับนโยบายเพื่อนำไปสู่การปฏิบัติที่จะทำให้เกิดประโยชน์สูงสุดกับชาวชนบทของภาคตะวันออกเฉียงเหนือแล้ว

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SUMMARY

This paper describes the nature of the present KKU Small Scale Water Resources Project. The project has been in existence since 1978 under various project titles depending on the donors. It is published here for documentation purpose.

The project concern is to build weirs and other small water related facilities for Northeastern village uses. Equally important aspect is the usage of available water. To this end the project has received a lot of attention since it seems that the approach used is innovative and promising in contrast to the usual approach used in similar projects conducted elsewhere by other agencies.

The paper discusses technical details of the project emphasising the techniques for village participation in order to bring about successful construction, operation and maintenance of the completed weirs. The key word seems to be the sense of ownership created through the unique approach in village participation of the project. So far, the project has attracted a number of foreign agencies expressing concern for large scale implementation. Effort is now being made to convince the Thai government in order to bring about change in policy formulation.

Background of the Project

The KKU Small Scale Water Resources Project (KWRP) was initiated in 1978 in the Faculty of Engineering, Khon Kaen University (KKU). It was initially conceptualized as an extension of the then existing Ford Foundation KKU project (VDP). Snce its inception, it was realized that the KWRP would provide an excellent opportunity for field testing of different weir designs and obtaining feedback necessary in research and training being conducted by KKU.

Objective

It is evident at least in Northeast Thailand that many weirs built in order to store or rainse water level for village uses do not meet their intended purposes. These unfunctioning weirs in the past were built mostly by villagers or sometime by government agencies. The causes of failure according to an evaluation performed by a KKU team (2) can be attributed to

1. unsuitable design
2. inappropriate construction technique
3. lack of maintenance

These causes, according to the KWRP, can be traced back to the lacks of the following three components.

1. a technical team who can design and supervise (technical knowhow)
2. villager participation
3. technology transfer

It is the objective of the KWRP to seek and test new approach of providing surface water for village uses. The approach to be tested

consists of combining the above three components in a suitable manner which will be described in the next section.

Approach

The approach used in the KWRP is based on a hypothesis that successful weir project must be planned from inception to operation and maintenance through village participation. The approach can be described as follow:

A team consisting of an engineer and a local technician was assembled early in the KWRP. The technician must be able to speak local language. Upon request from villagers, the team goes out to discuss the matter with them. After this initial discussion, the team will request villagers to organize meeting. The meeting is intended to

1. inform the majority of villagers of the project conditions, i.e.

a. construction material will be provided without charge wihile they must organize and provide laborfor construction free of charge.

b. operation and maintenance of the expected weir will be the responsibility of those who benefit from the weir in terms of water deliverly.

c. the villagers have to agree among themself as to the suitable location of the weir subject to preliminary technical feasibility which will be determined by the team.

2. make sure that villager participation occur as early as possible form the project inception.

There could be several meetings in this phase. Since the weir will not

be able to benefit every villager due to topographical limitations, the meeting process will automatically shake out those who will not benefit. After this initial phase, it will be evident whether the project should proceed. Usually the decision to proceed depends on three factors;

1. villager enthusiasm.

2. apparent ability to organize (which will be crucial during construction and operation).

3. the suitability of the selected weir site in terms of construction and structural aspects. From past experience, however, it was found that this usually was not a limiting one.

Once this is satisfied, the team then invesigate the selected site in order to gather field data for design purpose. Technically all weirs in the KWRP are similar in their configuration and shape as shown in KWRP manual (3). The field data are used to determine important weir dimensions such as the length and heigh of weir opening. The advantages of adopting the same weir configuration and shape are;

1. less confusion in transfer of knowledge on construction technique and size selection.

2. a simple manual on construction technique could be prepared and used for every project (3).

As for weir size selection a manual has been prepared (4). However, experience has shown that the user's backgroundneeded to use the manual is higher than that of normal villagers. It is therefore expected that a person who can use the manual to select suitable weir size should have some technical backround.

Once weir's proportions are determined from the manual, a model of the weir is made. Using styrofoam, the model can be made by inexperience person in one or two hours. This styrofoam model proved to be very useful during construction period.

During the design period, arrangement is made participating villagers for preparation of temporary road for deliverly of construction materials and equipment to the construction site. Before and during construction, the model is used to explain to the participating villagers the various aspects and sequences of construction. The use of model as such emerged out of the team's experience and proves to be effective in weir construction and transfer of knowledge. During construction period which last about one month, meetings at the site are made frequently. These meetings serve dual purposes, i.e. for effective construction supervision and at the same time as in site training for participating villagers. This in site training has produced a number of villagers who later are capable of being an independent construction sub-contractor themself. Some of these talented villagers at present are working in similar projects elsewhere. It is hope that these people will be a major work force in accomplishing the small scale water resources development in Northeast Thailand in the coming future. Since construction skill is in demand at village level, these people enjoy higher socio-economic status among fellow villagers. The KWRP also issues certificate of competency for these people.

Input

Necessary inputs the KWRP are;

1. Personnels : Personnels involved in the project are : one engineering and one technician.

2. Equipment : Major equipment are; one small pick up truck and a concrete mixer.

3. Budget : For the past five years of project operation, total expenditure is Thai Baht 9 million (US$ 400,000). Average cost per weir (including salary for project personnels but excluding labor) is approximately Baht 150,000. This figure is favorable compared to weir construction in other programs.

From past experience, it can be predicted that the cost per weir will be lower (except for inflation) as more experience is accumulated. Furthermore, as weir design becomes more standardized, engineer may not be required in the future.

Accomplishment and Obstacle

From 1978 to 1983, 40 weirs were constructed (using the approach described earlier) by a single team consisting of an engineer and a technician. The team could have built more weirs if their time was not diverted for something else such as construction of 30 rain water tanks and other minor projects.

Structurally and hydraulically, none of these weirs fail. However in term of operation, some weirs were modified (i.e. the weir crests were raised) by villagers to enable the weirs to deliver water to higher lands. This is considered normal for villagers almost always will expand their cultivatable land once it is clear to them that water can be made available. The above accomplishment is not without obstacles, i.e.

1. Village Leadership : It is surprising to observe how village leadership differ from village to village. Village leadership is very important in determining the success or failre of a project. Strong leadership usually correlate to strong villager participation and success of the project. In the KWRP point of view, local administration should be able to help promote strong leadership.

2. Village Politics : Usually this is minor but sometime can cause delay in locating weir sit. This implies that the weir site may not be located at its optimum site with respect to its usefulness. In the long term this could affect the weir efectiveness. There is little that can be done about this problem and it is something in which the KWRP tries not to get involved.

3. Unfair Dealing : One particular problem encountered frequently was the extent to which village councillors are involved personally in the construction and supply side of rural development proects - a practice which has led to a number of questionable financial dealings.

Future Plan and Direction

At this stage it is conceived that while the project is still going on, assessment should be made on the KWRP to

1. determine the socio-economics impacts of the weirs

2. estimate the ecolgical impact, notably those related to basic health care.

3. study the feasibility of enlarging the project such that it can cover wider area.

4. study strategy to be used in 3. This is considered

necessary since many government agencies are wellknown to be very conservative.

Accordingly, an assessment project proposal is being prepared. It is expected that the assessment can be made in 1984 to look at not only the past work but also live monitoring of the present work.

Acknowledgement

The KWRP was initially conceptuallize back in 1977 by Professor Chalong Kirdpitak in his capacity as the Dean of Engineering at that time, and Dr. Pradit Nopmongkol who became instrumental to the project preparation and operation. Equally importance was the financial support form the New Zealand government without which thprojet would never be what it is today. In 1983, the project was supported by thfe Canadian government. At present, the New Zealand government provides support which will last until August1985.

During the time of the New Zealand support from 1978 to 1982, Mr. Brian Worboys and Mr. Evan Mayson supervised the project having Dr. Pradit, myself and Dr. Intarachai Hovichitr as thai counterpart in succession. Khun Prasert Termsak later was assigned the counterpart duty for Mr. Mayson. In 1983, Mr.John Rene Rinfret, a CUSO volunteer took the responsibility as supervison for one year. At present, another CUSO volunteer, Mr. John Trowsdale replaces Mr. Rinfret having khun Prasert and Dr. Prakob Wirojanagud as counterparts.

All these people contribute to the advancement of the project. Experience accumulated through these advisors and their counterparts shapes the project practice and direction until a sound approach was developed as discussed earlier. A steering task performed expertedly by the committee of the Office of Water Resources Development, Faculty of Engineering can never be overstated. Finally withoutmki the supporting services provided by the Faculty of Engineering and its members, the project value would never be realized.

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สัจจะ เสถบุตร เกิดที่ฝั่งธนบุรี กรุงเทพมหานคร เมื่อวันที่ 3 เมษายน 2491 สำเร็จการศึกษาระดับมัธยมศึกษาทั้งตอนต้นและตอนปลายจากโรงเรียนอำนวยศิลป์ พระนคร สอบได้ทุนโคลอมโบไปศึกษาที่ประเทศออสเตรเลีย และได้รับปริญญา B.E.ทางสาขาวิศวกรรมเครื่องกล

จาก University of New South Wales เมื่อ พ.ศ. 2513 ต่อมาได้เข้าศึกษาต่อที่สถาบันเทคโนโลยีแห่งเอเชีย (A.I.T.) ได้รับปริญญา M.Eng และ D.Eng. สาขาวิศวกรรมแหล่งน้ำ เมื่อ พ.ศ. 2515 และ 2518 ตามลำดับ ในปี พ.ศ. 2523 ไปทำงานเป็น Post Doctoral Fellow ที่สถาบัน M.I.T. ประเทศสหรัฐอเมริกาและได้รับปริญญา M.S. กลับมาอีก 1 ปริญญา

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