

# UPSTREAM-DOWNSTREAM INTEGRATION

Lessons Learned from INTERDAWM Project, Indonesia

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## **ABSTRACT**

*Discussion had been raised on the need of integration particularly between the two major activities governing the water sustainability, namely river basin development at one side and watershed management on the other. The exercise had been called as the “Integrated River Basin Development and Watershed Management”, or in short the **INTERDAWM** Project. Dams and reservoirs are subsystems, which need to be managed in overall, integrated, multi-purpose, multi-objective, and as a single unit, to reach the predetermined objective. Based on that concept, the integration of management of multi purpose dams and reservoirs forms a non separable component of the integrated river basin development and watershed management. River basin development is an effort to develop water resources in an integrated and overall manner, towards optimization within river basin as a development unit and as a regional unit for water management.*

*Watershed management is an effort to manage renewable natural resources such as vegetation, soil and water to be able to generate utmost and sustainable benefit.*

*There were further considerations on the more effective integration in the form of Integrated River Basin Development and Watershed Management. Several issues that had been identified are: working mechanism, planning process, flow of information, people’s participation, food security, planning, programming and budgeting. It was recommended that action should be taken on 9 matters. Those recommendations are mutually interrelated and interdependent. Therefore it has to be implemented simultaneously to support the implementation of the principles.*

*Keywords : INTERDAWM, river basin, watershed, integration, recommendations.*

## **Background**

Upstream-Downstream Integration has a long history in Indonesia. In 1985 there were efforts to review the interaction between River Basin Development in the downstream part of a river and Watershed Management at the upstream part of it. The situation is, although the Government had strongly advocate the principle of *KISS* – “Koordinasi, Integrasi, Sinkronisasi & Simplifikasi”, meaning : Coordination, Integration, Synchronization and Simplification. But in the field there were no such practice. On the contrary, people had jokingly interpreted *KISS* as “Ke Istana Sendiri-Sendiri”, meaning : To the Palace Individually. Realizing those facts, a discussion had been raised on the need of integration particularly between the two major activities governing the water sustainability, namely river basin development at one side and

watershed management on the other. The exercise had been called as the “Integrated River Basin Development and Watershed Management”, or in short the **INTERDAWM** Project. This was a collaboration between Ministry of Public Works Republic of Indonesia and East-West Center (*EWC*), particularly the Environment and Policy Institute (*EAPI*), Honolulu Hawaii, starting from mid 1985 up to mid 1987. The program was financed under the Ministerial local currency budget and US foreign currency financing through the Development Studies Project (*DSP*) of the US Government.

## **Characteristics**

**Dams and Reservoirs** are major components of river basin development. In the approach of river basin development as one system, dams and reservoirs are subsystems, which need to be managed in overall, integrated, multi-purpose, multi-objective, and as a single unit, to reach the predetermined objective. Based on that concept, the integration of management of multi purpose dams and reservoirs forms a non separable component of the integrated river basin development and watershed management.

**River basin development** is an effort to develop water resources in an integrated and overall manner, towards optimization within river basin as a development unit and as a regional unit for water management. The concept of river basin development is directing towards the balance of development and management systems in the whole river basin and to safeguard the sustainability of the designated river basin. Its development may include the integrated and overall utilization of water resources in one or more river catchments with possibility to include the nearby catchments, as such that may create trans-basin development or even to cover the whole island. The direct impact of river basin development may cover also regions outside the boundary of the designated basin. River basin development plan may cover at least 15 development aspects, namely : flood control, irrigation, hydropower generation, domestic and industrial water supply, watershed management, sediment control, water pollution control, and some more other aspects such as navigation, recreation and tourism, fisheries, weed and insect control, swamps and drainage development, control of salt water intrusion, drought control, and groundwater development.

Water resources development must be comprehensive, in due considerations of the above mentioned aspects, namely aspects with need to be further developed, or aspects of those to be controlled. In combining and harmonizing one aspect to the other, the possibility of conflict of water uses in an integrated development plan can be avoided.

**Watershed management** is an effort to manage renewable natural resources such as vegetation, soil and water to be able to generate utmost and sustainable benefit. As a precondition to realize this objective it is necessary to build the awareness, capability and participatory role sharing of the society to be able to utilize and maintain those natural resources wisely.

Watershed management is applied through ecosystems approach in an integrated manner based on watershed as a management unit, with main objective as on the component which naturally susceptible to damage, especially erosion at the upper and middle reaches with slope more than 8% in due consideration to other influence factors.

Watershed management covers several efforts, namely vegetation, land, and water management. Especially land and water management is interwoven. Any treatment on a land will influence the hydrological behavior of that land, on the other hand the river and hydrology behavior will influence the soil property. In this sense, soil conservation as the main element of watershed management will have significant impact on the success of river basin development, and therefore it is necessary to have close coordination between soil conservation and river basin development.

## **Concept**

Since the National Seminar on Environmental Development in 1978 there were rising awareness on management of natural resources and the environment. Natural resources are very limited, therefore it has to be wisely utilized and optimally and efficiently managed. Natural resources consist of water, soil, forest, mineral and ocean resources. Those are interrelated and therefore there is a need for managing it in a unity. In this respect, river basin development is a component of national spatial and land use plan, which cannot be separated from management of other natural resources such as forest and land, in the framework of watershed management. On the contrary, those natural resources are very significant in the success of river basin development with respect to the sustainability of water resources itself. It is obvious that the success of river basin development in several areas is threatened by the deterioration of upper watershed, endangering the sustainability of the existing hydro structures.

In line with the raising awareness on orderly management of natural resources in general and river basin development and watershed management in particular, since 1979 had been prepared the formation of Integrated River Basin Development Plan based on the concept of "one river one plan" starting from Brantas River Basin in East Java. This effort had resulted to the establishment of an integrated plan coordinated by the East Java Provincial Planning Agency. In 1980 the effort was extended to Bengawan Solo River Basin in Central and East Java coordinated by the Provincial Planning Agency of Central Java in cooperation with the same agency in East Java. After that, it was extended to the other three basins, namely Jratunseluna River Basin in Central Java, Citanduy River Basin in West and Central Java, and Cimanuk River Basin in West Java.

In 1985 there were further considerations on the more effective integration in the form of Integrated River Basin Development and Watershed Management, which was further deliberated in the INTERDAWM Project, with its milestone on the conduct of the MPW-EWC Workshop at Jakarta and Cipanas on 22-27 March 1986. In that workshop several issues had been raised and concept had been formulated for the best practices in INTERDAWM approach.

## **Issues and Analysis**

Several issues that had been identified and analysed are as follows :

**Working Mechanism.** The working mechanism to integrate several activities had not been done as required, either from the point of view of legislation as well as of the implementation in the field. It happened very offend, that the planning process still reflects the need and interests of each sector as such that it did not support the efforts for integration. The existing planning process were not able to reach the coordination to secure the integration between programs and projects, either at national as well as at local level. A realistic integrated river basin development had to be based not only on the resource capability and the needs to be satisfied, but should also consider the typical characteristics of each river basin including the motivation and interest of local society to share their role in the development. The integrated system to be applied should be workable and acceptable to various agencies involved in plan formulation, its evaluation and implementation, either at national or local level. With this approach it is expected that the resulted plan will be able to accommodate all interests, activities and disciplines to be integrated based on the principle of “one plan for one river basin and watershed”.

**Planning Process.** The plan for river basin development and watershed management is closely related to spatial and regional plan. Integration between those plans means enhancing efficiency and effectiveness of development and management of natural resources, since it will avoid duplication and gaps. It is therefore necessary to adopt a proper and standardized multi level planning process supported by the capacity building for personnel involved in those activities. Planning capacity for local agencies should be enhanced and given the proper authority as partners of national agencies in plan formulation, evaluation and implementation for river basin development and watershed management in the framework of integrated regional development.

**Flow of Information.** In this respect, there is a need for flow of information and two ways directives between national and local agencies to streamline the planning process, resulting in a top down and bottom up planning processes. Such procedure requires enhancement of authority, responsibility and capacity of local agencies in planning, monitoring, evaluation and implementation of natural resources development and management. Review has been done on the need of information system for river basin development and watershed management. A timely reliable and adequate information is necessary for the decision making process towards the rational and efficient allocation of resources. A considerable data has been collected so far but is not well organized. There is a need for Information Center to collect data and information and to manage it for the use of several parties.

**People’s Participation.** Planning and implementation of river basin development and watershed management absolutely requires active participation of natural resources user’s communities. In this respect, a good plan is not only accommodating technical, economical and environmental considerations, but should also accommodate the socio-economic considerations of the user’s communities, in order to encourage them to take part and share their roles in the development. If necessary it can be applied efforts in capacity buildings, among others extension, education and training, and certain incentive applications.

**Food Security.** Efforts should be done to maintain food security and safeguarding the sustainability of natural resources. It means that we should control flood and drought, erosion and sedimentation, water quality deterioration, and development gaps between upstream and downstream reaches of rivers. More integrated activities are required to overcome those problems, especially in the most critical watersheds. The result of which will not only safeguarding the sustainability of natural resources, but it will also secure our savings, either in the development efforts as well as in maintaining their results, which will finally speed up the achievement of the utmost development objectives.

**Planning, Programming and Budgeting.** Another principle matter is to improve the mechanism to integrate planning, programming and budgeting process. The integration of such process in accordance with its stages will influence the integration of a certain development plan, for instance in a regional development, covering a sub basin, an upper watershed, or a river basin as a whole. Integration in programming covers preparation of long term, medium term and annual program, broken down into physical and financial program by each related agency, and submission and approval of such program as a base for annual budget. Integration in budgeting needs integration of budget preparation for the activities of each agency, includes also the submission and approval of annual budget. Although the planning mechanism for each sector has been done satisfactorily, but within the existing organization system it is hard to produce a real integrated plan for the whole river basin and watershed.

## **Recommendations**

After a thorough study it was recommended that actions should be taken on the following matters :

1. Improve the existing legislation and reinforce its implementation, including the formulation of new regulations necessary for coordination, integration and synchronization of the INTERDAWM activities.
2. Develop and implement the institutional mechanism and its management in the framework of conservation, utilization, development and control of quality and quality, especially related to timely allocation of water.
3. Establish coordination mechanism at national as well as regional level to enhance the integration in planning, programming, budgeting, implementation and evaluation of INTERDAWM. At national level, Steering Committee should be established, consists of the representatives of several sectors and local government, and formulate plan and program based on objective considerations.
4. To secure the integration, considerations for annual budget should be based of INTERDAWM wit due consideration on interrelation between component activities of one sector to the other or between sector and local government. Annual budget based on that approach should become the main pre-condition to reach the integration of implementation programs.
5. To improve the people's participation, beside the application of education and extension, it is necessary to involve community organizations in planning and implementation of INTERDAWM, and create opportunities for economic

- incentives. Those organizations are either formal or informal entity. While the economic incentives may come from the benefit of the operation of infrastructures, creation of employment opportunities or in the form of subsidies.
6. To review the possibility of guided program for intensive dry land farming in the upper watershed. Assessment is necessary from the experience gained in the previous intensive wetland farming and the Greening and Re-forestry Special Program as the basis for recommendation on intensive dry land farming.
  7. Capacity building in monitoring, evaluation and supervision at all level of INTERDAWM. To develop the principles and standards for the information systems, and to develop institutions and personnel capable for the implementation of their function at national as well as local level.
  8. Establish the magnitude of supply and demand for water, starting from the river basins with high priority to be developed in integration, as a basis for planning and rational allocation of resources at local level.
  9. Due consideration for the possible improvement of the role of existing organizations for fully functioning in soil conservation, to be able to create methods for proper erosion control for various land uses such as agriculture, forestry, estates, road construction, settlements, industries, river banks, mining and so on.

Those recommendations are mutually interrelated and interdependence. Therefore it is recommended to be implemented simultaneously to support the implementation of the INTERDAWM principles.

**Jakarta, 13 February 2006.**

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