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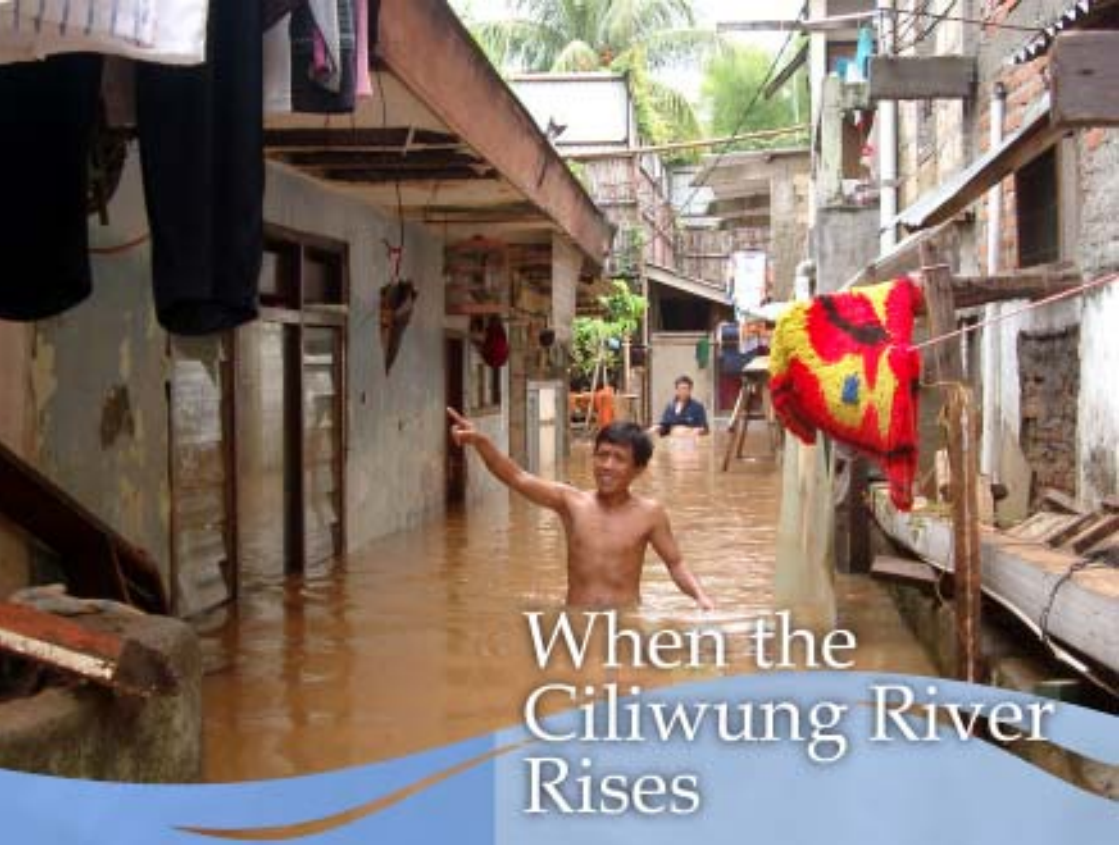
UNESCO Office Jakarta

Flood Mitigation

A Community-based Project

Maximizing Knowledge to Minimize Impacts



When the Ciliwung River Rises

"During floods in early 2002, at least 30 people were killed and 300,000 were forced to flee their homes. The biggest flood in the city's history hit 168 of 262 sub-districts and paralyzed the capital for days."

(The Jakarta Post, 10 September 2003)

With its population exceeding twelve million, Jakarta is considered as one of the most problematic "mega-cities" in the world for its intricate urban development issues. Located in a coastal lowland area cut across by 13 rivers and many other streams, Indonesia's capital city is affected by recurrent inundations, especially during the rainy season (from October to March).

In February 2002, disastrous floods affected 24 % of its total area (around 650 km^2), claiming at least 30 lives, and paralyzing the city for days. One of the most-severely affected areas was the sub-district of Kelurahan Bidara Cina (East Jakarta). Divided into 16 community organizations (RW, i.e. Rukun Warga, local neighborhood units under the authority of Kelurahan),

Recurrent severe flooding, especially in 1996 and 2002, caused great damage and economic losses to the population living in and outside Jakarta. Besides high annual rainfall, rapid urbanization is considered to be a major factor amplifying the magnitude of floods. Two main causes related to the high rate of urbanization are impermeabilization of catchment areas and the use of the river for waste disposal.

Kelurahan Bidara Cina is inhabited by approximately 44,000 persons. The neighborhood unit RW 06 was selected as the pilot area for the implementation of the project (more than 3.000 residents). Located along the Ciliwung River, this area is particularly vulnerable to inundations and was affected by severe, recurrent flooding over a five-year period. In February 2002, the average height of flood waters ranged from 150 to 300 cm, affecting 30 households. During the inundations, which usually occur once or twice a year, many residents have to evacuate to safe places (offices in RW 07, the Public Health Center in RW 06 or Otto Iskandardinata Street). During evacuation, the Indonesian Red Cross and different governmental and non-governmental organizations help the community to establish a public kitchen, shelters and offer free medical treatment. Residents sometimes refuse to leave their homes, and get trapped. In such cases, a rescue team helps them evacuate using ropes and special, rubber-inflated inner tubes and also provides food.

RW 06 of Kelurahan Bidara Cina is the community organization selected for this pilot project. Identified as one of the most severely affected areas during the floods of 2002, it was selected following the recommendation of the City Mayor of East Jakarta. It counts **757 households** for a total population of **3,076 persons**. It was one of the five RWs of Bidara Cina most badly damaged by previous floods. Many residents of RW 06 live on the Ciliwung's river banks, and thus are extremely vulnerable to annual floods.

The project is based on three fundamental principles:

- Community participation
- Non-structural mitigation measures
- Bottom-up approach

The Community as Main Actor

Dealing with floods is like putting together the pieces of a puzzle, as understanding the causes of floods involves accurate consideration of a range of environmental and socio-economic factors. For these reasons, it is generally recognized that there is a need for coordinated action at all levels, encompassing all community actors. A disaster-reduction programme should normally begin with the identification of the specific problems that a community faces and with the assessment of people's perceptions of how to solve them. This approach avoids the constraints which may arise when the solutions proposed are solely generated from actors, such as authorities, institutions or organizations external to the community and, therefore, may not reflect local needs.

Starting from these considerations, the Community-based Flood Mitigation Project was designed and developed on the basis of three simple but fundamental principles:

1. Community participation;
2. Non-structural mitigation measures;
3. Bottom-up approach

1 The **spontaneous participation** of the community in all phases of the project is important to ensure the effectiveness and the efficiency of the results of the mitigation measures. The first phase of the project consisted of several activities aimed at assessing the community's

vulnerability and capacity to cope with, mitigate and recover from floods. The community participation is especially needed in order to identify priority actions and target groups, but also to increase the visibility and legitimacy of the activities and measures proposed.

2 Flood mitigation consists of preventive measures taken in order to decrease or eliminate the impact of the event on society and the environment. It includes structural and non-structural aspects. Structural measures comprise attempts such as raising streets and floor levels, the construction of canals, dikes and sluices, etc. **Non-structural measures** include the development of early warning systems and activities aimed at increasing community preparedness to deal with floods. Human resources in the form of knowledge, skills and local cooperation in response to these events are extremely useful in minimizing economic losses. For this reason, non-structural measures embrace public education and training courses for the community.

3 The second phase of the project, the implementation phase, is characterized by a **bottom-up approach**: the community itself, through the establishment of a community forum, developed different proposals for activities (waste management, forum strengthening, technical attempts for flood preparedness) aimed at improving its own capacity to cope with floods. The community forum is responsible for identifying possible solutions and monitoring and ensuring the implementation and follow-up of the flood mitigation measures taken.

"Previously, I took the flood occurrence for granted. We are used to it, anyway… What we did was only securing the valuable properties by putting them to higher and safer places."
Oemar

Residents try to save their valuable belongings ...

Enhancing the Community's Ability to Deal with Floods

Changing people's behavior:

The Flood Mitigation Project is designed to improve the community's understanding and awareness of natural and social components of floods and aims at strengthening the people's preparedness to deal with these events. The final objective is to bring about changes in the community's behavior in order to reduce the vulnerability of residents and their homes. Besides the improvement of management and coordination systems, the achievement of such goals requires the full involvement of community members who need to be supportive and willing to contribute to the success of the activities proposed.

The pilot project is intended to be a first step in establishing a permanent program of flood mitigation involving other neighborhoods of the city. Each phase of the project was conceived in a way so as to be easily replicated on a larger scale, with the ultimate goal of improving flood control throughout the entire city.

Methodology:

The project was structured in two phases. The first phase from July 2003 to January 2004 was characterized by the **facilitation** process, which included activities aimed at assessing the community's capacity and vulnerability in relation to flood events, and by **public education and training courses** for community representatives. The training involved community-based first aid; integrated waste management; flood mitigation; institutional framework;

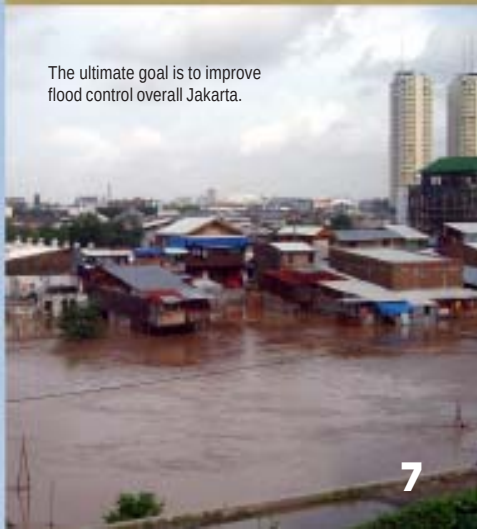
Full involvement of community members is needed in order to ensure successful results.

and strengthening community capacity. At the end of the first phase, a community forum was established. This consists of 20 representatives who participated, on a voluntary basis, in both the facilitation process and the training courses. Their first responsibility was to develop several proposals about possible activities aimed at improving the assessed capacity and decreasing vulnerability.

The second phase consisted in the implementation of the community forum's proposals. From May to August 2004, the community's representatives attended **new training courses**, such as search and rescue; post-flood health management, waste management and leadership training. Besides the training courses, a **waste collection system** was established, promoting recycling and composting.

The Community Forum

To ensure the participation of the residents in each phase of the project, a community forum was established. Its members followed the training courses and later developed the program proposals implemented in phase two. The community forum plays a fundamental role. It is the channel through which the residents of RW 6 can express their needs in relation to floods and acts as a multiplier of knowledge. It is expected to be a motivator for the other members of the community. The forum is in charge of pre- and post-disaster assistance and of the coordination with government authorities as well as within the community itself. In addition to that, it is responsible for ensuring the continuation of the program and for developing future activities.



The ultimate goal is to improve flood control overall Jakarta.

The Training Courses

Learning more about floods

The training was divided into two modules. During the first module, community members were introduced to flood disaster management. The training focused on the following subjects: causes and consequences of floods, basic hydrological concepts and processes, interaction between water and urban waste, flood disaster and risk assessment (including capacity and vulnerability assessment), and institutional framework for flood management.

The purpose of the first module trainings was to provide the residents of RW 6 with basic knowledge of flood disaster processes and impacts and mitigation measures.

"After the establishment of the Community Forum, I feel that we are more unified in helping the victims of floods. I personally benefited from the activities undertaken, such as Search and Rescue training. Before, I had no practical experiences in helping the flood victims, but now I know how to do it." Sofyan

How to live with floods

While the first module trainings aimed at introducing the community members to the concepts and theories of flood mitigation, the second module gave participants the opportunity to take part in more practical activities in the field. Among them are waste management training (see next page); public awareness - where the community learned how to disseminate knowledge regarding floods through educational materials and media campaigns, how to establish a communication network, how to organize search and rescue simulation activities and community-based first aid.

During the second phase of the project, community members attended new training sessions conceived as a follow up to the first module trainings. These included: leadership training – to develop the organizational skills and the leadership capacity of team members and the community in general; waste management; search and rescue; fire drills – technique of extinguishing a fire by using wet sacks and simple fire extinguishers; and public health – to provide information and counseling on post-flood epidemic diseases and initial treatment.

Waste Management

Improving the quality of life while decreasing the impact of floods

Floods are major causes for the loss of life and property, but death is caused more often through water- borne diseases than by drowning. The danger of drowning is acute in flash floods and surges. Few people drown in river floods, but poor environment conditions aggravated by floods cause suffering, disease and death.

Photo Caption:

During floods, the garbage obstructs the dykes and the channels, impeding water to drain and increasing therefore the impact of these events.

Dumping waste into the river:

Most inhabitants of RW 6, especially those living along the river, use the Ciliwung River as waste disposal despite the availability of a collecting system through handcarts. One of the reasons is that many residents are reluctant to pay for their waste to be collected, showing strong lack of sensitivity concerning the environmental quality of their neighborhood. The waste management activities aim at changing this behavior and at promoting a better quality of life, while decreasing the negative impact of floods. The Community of Banjarsari, South Jakarta, where a project on waste management was successfully implemented, provided the training, in close collaboration with UNESCO - Coastal Regions and Small Islands Unit.

Before...

"I used to dump the waste into the river even though I realized it was wrong. I don't have to do it anymore, since I only have to wait for the waste collectors to come and take it, so that the river and the surrounding area become cleaner." Juki

"I used to walk a long way to dump the waste into the river. Now, we only have to wait for the waste to be taken by the handcarts." Pinah

... and after

A waste collection system:

Pilot test for the establishment of a waste collection system started in May 2004. Twenty-two communal waste bins and 205 household waste bins were distributed, with the aim of encouraging the residents to dump their waste in appropriate places. Once a day, three persons collect the waste with a waste cart. The collection system has been successful, since most residents started using the waste bins instead of dumping their waste in the river or on the riverbanks. After two weeks, the positive impact of the collection system on the local environment of RW 6 was already visible.

Training on
paper recycling.

Paper recycling:

With the aim of empowering the young people living in the community, some of whom are unemployed, paper-recycling activities were introduced. The training was provided by a facilitator who came from Banjarsari. In addition to this activity, the participants learned how to create new objects out of used materials (photo-frames, small boxes, etc.).

Composting is another initiative which will be implemented later in order to reduce the volume of household waste, mainly organic waste.

The **closure of access to the Ciliwung River** was also decided in order to discourage residents from using the river for waste disposal. Four accesses were closed thanks to the construction of new fences.

Support

Even if efficient flood reduction initiatives are mainly attributed to spontaneous participation of the communities and direct involvement of people, the implementation of community-based flood mitigation actions has to go beyond the mere initiative of the local community. Full successful results need external support from government institutions, non-government organizations (NGOs) and, sometimes, international organizations. Therefore, the Hydrology Unit of the UNESCO Regional Science Bureau for Asia and the Pacific in Jakarta, as well as both Education and Coastal Regions and Small Islands Units supported this project in close collaboration with LAPI–ITB. A team of LAPI-ITB was responsible for facilitating the community and helping it develop and implement the pilot project.

Other institutions provided external support. For example, the Indonesian Red Cross provided the community-based first aid training and the Community of Banjarsari, South Jakarta, in close collaboration with UNESCO Coastal Regions and Small Islands Unit, provided the training on integrated waste management. The Section of Sanitation of East Jakarta Municipality provided support for the initial phase of waste collection.

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