CHAPTER IV
COMMUNITY PARTICIPATION

OBJECTIVE

In accordance with the objective and target of this project which aims towards community independence, the scenario/action plan that need to be considered is to promote active participation from the dari community and local government officials to collectively participate in the process of planning, implementation, control, and the monitoring and evaluation.

Community-Based Flood Mitigation (CBFM) is based on the characteristics and is one of the community development programs, with four main characteristics:

- Promote collective consciousness (of the target community) in flood disaster mitigation
- Continuous development of community organization
- Apply participative development principles
- Build the community capacity

With the above community development frame, we need to develop an approach method that encourages community participation, meaning that it places the community as the main actor of development (in flood mitigation). This will raise the sense of ownership of the community towards the Community –Based Flood Mitigation Project in the City of Bandung.

Community-based development, or better known as people empowering, is implemented to “change” the community and raise their ability to analyze their conditions, find the solution that will improve them, and develop their potentials and skills in order to improve their quality of life.

Changing the community behavior require education, not in the formal form, but through a learning process done by the adults in a collective activity (Adult Education Method). In the learning process “Adult Education Method”, outside parties only act as facilitator of the learning process to share knowledge and experience.

One of the participative approach methods known to be very effective is the *Participatory Rural Appraisal (PRA)* method, or the promotion of community participation. The PRA Method was first developed by Robert Chambers, an expert in the community development. The PRA method was founded on the fact that almost every community development programs are mostly planned by the executive organizations without directly involving the community who are the target group.

4.1 COMMUNITY TRAINING METHOD

There are three main elements of participative approach. The first element is the learning process between the community and facilitator, or between the outsider with the insider to share various knowledge and experiences that will increase awareness. The second element is the use of learning tools, which are PRA techniques to identify the various potentials and problems that exist. The final element is the output of the learning process and use of PRA techniques, which is the program/project as a short-term output and social development as the long-term output. These three main elements of participative approach are called community training process.

4.1.1 PRA METHOD

Directly translated, PRA means to participatively understand a village/kelurahan. According to the terms PRA represents a group of approaches and methods that will encourage the community of a village to actively participatein raising and analyzing their knowledge of their life conditions in order to create the correct action plan. This means that by implementing PRA the community is facilitated by an outside party—such as researchers, donor or officials—to analuze their life conditions that consists of existing potentials and problems in their village/kelurahan. They are facilitated to develop a program based on

those existing potentials—and also the potentials available outside of their village/kelurahan that are possible to be used by the village community—to solve the problems of that community.
The creation of the PRA Method has a background of the long experience from an expert in the community development, Robert Chambers (1983), in the field of community development in various developing countries. Based on that experience, the community, especially the marginal class, such as the women, farmers, and children, must be involved in every development process. We must listen to their oppinions, complaints, life experiences, hopes and analysis ability, in order for us to create a plan. They not merely the object of development, but we must also help to position them to be development actors.
According to Conyers (1984), positioning a community as the development actor is important because of three reasons. The first reason is: the community is the source for information on the conditions, needs and attitude of the local community, thus without them development programs and projects will fail because of innacuracy. The second reason is: the community will trust a development project or program if they know the twist and turns of it. The third reason is that it is the right of the community to be involved in the community development that targets themselves.

4.1.2 PREVIOUS DEVELOPMENT METHODS

The PRA is not purely a new method, but is an adoption and development of various other methods/approaches that were developed before it, such as:
Andragogy of Education
A well-known expert in education from Brazil, Paulo Freire (1971), gave plenty of critics on the education system that was not participative and did not empower the students. He criticized the convensional education and counseling ways—by referring to it as domestication—as a form of imperialism in the education system. This philosophy of participative education in the system of educatin and counseling is adopted by the PRA method.
The Field of Research and Science
According to Robert Chambers (1992) there are five main trends that decorate the principle method of PRA:

a) Participatory Action Research, born from the suggestion of Paulo Freire, stating that the poor can and have a possibility to analyze their facts and conditions. Recognition of the ability of the village community in analyzing their problems is adopted into PRA;

b) Agroecosystem Analysis, is acombination between system analysis and ownership system by analyzing space, time and the cause-effect relation, realtive values and decision making. The methods that were adopted into PRA from this method ini is the *transek* technique (location trace), mapping, seasonal calendar, Venn diagram (inter-party relations) and ranking matrix;

c) Applied Anthropology, created as an effect of the critics to the science of pure anthropology that emphasize more on the comprehension of the community. Applied Anthropology is intended to judge the ability and validity of village community knowledge and to differ between the soul-frame of the outsider with the insider. What PRA adopts from applied anthropology is that studying outside in the fields is a flexible are and not a stiff science, the difference between *emic* (community norms) and *ethic* (scientific norms), the validity of indegenous technical knowledge of the village community;

d) Field Research on Farming System, the focus of attention is in field research participation, because the farmers as the main actors in agriculture are very experienced people that have their own ways to maintain the live of their agricultural system. This method contributes to PRA its sketching technique;

e) Rapid Rural Appraisal/RRA, developed because of a number of reasons. The first being the increase of disappointment against anti-poverty bias as the result of “village development tourism”. The bias referred to are: *spatial bias* (people only come to visit villages that are still close to the city, the main roads and village center, and ignore the borderline villages); *project bias* (only provide attention and support for villages that are in a project’s area); *personnel bias* (favors men better than women, the elite than the poor, the service users than the non-users, etc.); *seasonal bias* (preference to visit the villages

during the dry season or during harvest time compared to the wet season or time of famine); *diplomatic bias* (people from the outside do not wish to meet poor people or see appalling conditions that can touch their hearts). All those biases can combine to conceal the worst poverty of all. The second reason is the disappointment of conventional survey methods. For years and in many places, experience has shown that surveys using questionnaire tend to be over-rated, boring and confusing. The data received are often inaccurate. It also takes a long time to report, is boring and difficult to use, which in the end is often abandoned. The third reason is there has been efforts to find a new and better method that is more effective, by empowering the indegenous technical knowledge of the village community as a source of information to analyze and use for the experts from outside.

4.1.3 FROM RRA TO PRA

The Rapid Rural Appraisal (RRA) approach is the largest contributor, for both principle and techniques developed by the Participatory Rural Appraisal (PRA). PRA is a model of RRA that is more participative. Discussions in the Internasional Kohn Kaen Conference in 1985 produced a typological RRA, one of which is participatory RRA.
In 1988, participatory RRA was listed as one of the four methodology groups of RRA by the International Institute for Environment and Development (IIED) Team. The other three were exploratory RRA, topical RRA and monitoring RRA.
In September 1988, the National Environment Secretariat in cooperation with the Clark University, implemented RRA in Mbusanyi, a community in the district of Machakos, Kenya. In that program RRA was adopted in the management plan for, and was established as PRA. In India, between September and October 1988, Aga Khan Rural Support Pragramme (AKRSP) was interested to develop Participatory RRA, by inviting IIED to assist, Jennifer Mc Cracken provided consultation for four weeks with the AKRSP in Gujarat, where the Participatory RRA was implemented.
Since that moment innovations excalated, especially in India, not only in both governmental and non-governmental organizations. In the beginning of 1992, Action Aid, AKRSP and MYRADA were hosts for the International Roving PRA Workshop in India, which were attemded by 14 people from 11 southern countries. After that workshop PRA developed in many countries, including Indonesia.
In Indonesia PRA has been developed by a number of non-government and government organizations. A number of LSM had applied PRA in developing the village communities (especially) in the East Indonesia Region. Many government projects such as the River Network Management, IDT and Village Community Participative Development Planning (P3MD) also applied the PRA method.

4.1.4 BASIC PRINCIPLELES OF PRA

Based on the method/approach discussed above, PRA emphasize on the process of more participative study (instead of exploratory). The focus on more participative process is the paradigm of PRA. This paradigm will become obvious by understanding the following basic principles of PRA. There are at least 11 basic principles that must be referred to in the implementation of PRA, they are:

1. *Learn from the community.* The most fundamental principle in PRA is the idea that PRA is from, by and for the community. This means that PRA is built on the recognition and trust of norms, relevance of the traditional community knowledge and the community's ability in solving their problems by themselves. This principle is the reversal of the conventional method that 'teaches' the community.

2. *Outsiders (researchers, experts and officials) are facilitator, insiders (the community) are actors.* As the coonsequence of the first principle is that the outsiders need to realize that their roles are only as 'facilitators' and not 'actors, teachers, counselors or researchers'. This require modesty, the will to learn from the community and positioning the community members as the main source in understanding the conditions of the community. In the application of PRA, the community dominates the activities.

3. *Learn from and share experiences with each other.* Although there is recognition of the traditional experience and knowledge of the community, this does not mean that the community is always right and is left unchanged. Likewise, 'modern' knowledge introduced by outsiders is not always able to

solve their problems. Thus, both the experience and knowledge of the community with the experience and knowledge of outsiders, complement each other and are just as important as the other. The Process of PRA is a dialog forum between the two systems of knowledge to yield something better.

4. *Relaxing and Informal*. The PRA activity should be conducted in a flexible atmosphere, without pressure, open, and informal. This relaxed situation will promote friendship, where the outsiders will merge as a member of a discussion group, not as a stranger.

5. *Involvement of all the community groups*. One mistake that is often made is the view that the leaders, community or group personage in the community can represent the whole community. This mistake will produce programs that will only satisfy the interests of certain groups and will not be supported by the community in general. Thus, in order to prevent bias and gain support from the vast community, the PRA activity must involve every class, men, women, the elders, rich-moderate-poor people and represent many villages.

6. *Respect differences*. Becauset the participants of PRA come from a diverse community (various classes or types), many oppinions or arguments shall arise. That is why it is important to promote respect between participants. The core of the activity is to try a variety of information and not give the average output. Variation of information and problems will be organized and arranged by the community as the owner.

7. *Triangulation.* In order to get information that is reliable, we can use triangulation method, which is a form of check and recheck. Triangulation can be done by: (a) utilizing a variety and combination of PRA techniques. Each PRA techniques has their advantages dan disadvantages. Not all the information needed can be attained, discussed and used with one or two techniques. One PRA technique will complement another. (b) Identify the types and sources of information. The validity of each information must be carefully studied with other sources and techniques. For example, the official statistic report on the area of various types of landuse in the village must be cross-checked with the village map made by the community. Problems suggested by village government officials and community personage, can be cross-checked with statements from the community during the discussion. Different views from team members with different education background will provide a more complete picture of the information and also provide deeper examination from various aspects.

8. *Optimizing the results*. The implementation of PRA activity will require time and energy from the source persons, exceptional implementation and the participation of community members, which will require funding. In order to effecively use the fund, the PRA activity should optimize its activities by focusing on things that are most important with a conclusion that is close to being correct completely, although never completely correct.

9. *Learn from mistakes*. Committing mistakes, often considered abnormal, is considered normal in PRA. The important thing is not the perfection in the implementation, which would be difficult to achieve, but the best application according to the capacity, and then to learn from the mistakes, to improve future activities.

10. *Practical orientation***.** PRA orents to solving problems and program developing. This requires relevant (logically related to the program) and sufficient information. What it needs is optimum knowledge, not every information has to be collected and studied. The principle is, the right approximation will be better than an exact but wrong conclusion, or it is better to achieve an approximation that is almost wrong than almost right. The almost-right conclusion is almost a mistake. On the contrary, the almost-wrong conclusion is almost correct.

11. *Continuous*. PRA Activities are not 'activities packet' that is completed after the information gathered is considered sufficient. Community interests and problems are ever changing and shifting according to time. Thus PRA must be comprehended by institutions and field executives.

4.1.5 PRA TECHNIQUES

4.2.5.1 History Plot

1. Definition

History plot is designed to reveal the history of the community in a certain location by listing important events that occurred in the past. Those occurrences can be studied and considered in developing future programs.

2. Benefits

a. To identify and know the important topics in the community in the past
b. To understand the condition of the community in the present by acknowledging their history
c. Learn from the past

3. Types of Information that can be collected

a. History on the establishment of the residential area
b. Availability and management of natural resources
c. Development of village facilities and infrastructures
d. Change in ownership status, land ownership and usage
e. Past projects and their success rate
f. Quality and quantity of past flood disasters
g. Other topics relevant to the requirement of the program/objective of the application of PRA

4.2.5.2 Seasonal Calendar

1. Definition

Seasonal Calendar is used to gather information on the condition and problem that repeats itself in a certain period of time. This technique is useful to identify and study community life pattern, time utilization pattern, activities, problems and repetitious occurrences within a certain period of time, and identifying the focus of the community activities

2. Benefit

a. To learn of the time utilization within a certain period (one year)
b. To understand the condition of the village/kelurahan and find the focus of the community activities in a year

3. Types of Information that can be collected

a. Precipitation, water availability
b. Crop pattern, level of production
c. Availability of food
d. Problems relating to pest and pet/plant diseases
e. Workforce availability
f. Flood and non-flood seasons
g. Other informations relevant to the program

4.2.5.3 Daily Routines

1. Description

Discussion between the community on time utilization for each dayfor various groups of the community (rich, moderate, poor)

2. Benefit

Profile of time utilization to identify:

a. Who does what, work distribution in each house;
b. When the job should be done and how long will it take;
c. The work load difference between various groups (rich, moderate, poor), and;
d. Use of spare time in the community (for developing counseling activity).

3. ***Types of information that can be collected***
   a. Daily activities of the community
   b. Time of execution
   c. Work distribution in a family of each community group

4.2.5.4 Mapping

1. ***Definition***

   Mapping is the making of maps for the village that depicts the conditions of the village area and its environment. By collectively making the map for their area, the community will further recognize their village conditions, area borders, settlements, flood disaster areas, etc.

2. ***Benefit***
   a. To recognize the conditions of the village/kelurahan and its community through the map produced collectively by the community itself
   b. As a means to further recognize the conditions of their area completely including the pattern of flood occurrences, relationship between various things and conditions existing in the area, and the various existing problems and potentials

3. ***Types of information that can be collected***
   a. The process of making the general area map to show the general conditions of the village and its environment, regarding natural resources and existing facilities & infrastructures in the village, the physical condition of the village environment such as the topography (land slope, etc), the area and arrangement of gardens/farms, spread of residential areas, ponds, flood inundation fields, water springs, rivers or water canals, schools, posyandu, puskesmas, highway, and so on.
   b. The making of specific map for flood disaster areas (topical), to gather the flood aspect in an area of houses, and so on

4.2.5.4 Transek (Location trace)

1. ***Definition***

   Transek is intended to gather information via direct observation to the fields by walking through the village area (RW 09 and 14), following a pre-planned path. The result of such observation is presented in a figure or table

2. ***Benefits***
   a. To gather more detailed informations on the problems and potentials of an area (RW 09 and 14)
   b. To complement other informations from the mapping activity
   c. Gather informations on a specific topic, such as the condition of water canals, vegetation, management of resources, agricultural system, flood disaster mitigation technique already implemented by the community, and so on

3. ***Types of information that can be collected***

   The types of informations that can be gathered will be matched with the objective of the observation/information collection. In general the informations that can be collected through this activity are:
   a. Physical conditions of the village environment (RW 09 and 14), such as: land slope, type of soil and the fertility rate, water springs, land use and so on
   b. Flood mitigation efforts already implemented by the community, such as: construction of embankment, expansion and maintenance of water channels, garbage disposal behavior and so on
   c. Information on existing potentials and problems of the area
   d. Social and cultural information, such as the habits, healthm religion, economy, and so on

4.2.5.5 Sketch of the flood disaster location

1. ***Definition***

   Sketching the flood disaster location is intended to gather information through the sketch of flood conditions at certain locations and covering various aspects of flood mitigation activities. This

technique can encourage discussion between farmers to analyze the flood conditions to assist in developing the flood disaster mitigation plan

2. ***Benefits***
   a. To get a better picture (more detailed) on the condition of the flood based on physical and non-physical informations, which were observed during the activity in the location
   b. To gather information on various aspects of the flood location in an area. For example the various aspects of a flat area can be compared to a sloped area
   c. As a measn to share knowledge and experience between one community with another and between community and the experts from the 'outside'
3. ***Types of information that can be collected***
   a. Physical informations, such as: pattern of/flood course, area/spread of the flood disaster, mitigation practices, and so on.
   b. Non-physical information such as informations on the income from farms, fish ponds, rice fields, the counseling required, traditional agriculture technologies, and the expectation of the community to manage a rice field, ponds, and so on.

4.2.5.6 Occupation Analysis

1. ***Definition***

   Analysis of the occupation is a discussion activity to recognize analyze the conditions of the community life from the aspect of their occupation. Using this technique we can determine the types of occupations, work distribution, level of income and expenses of the community and the role of the men and women in the occupation sector. Those informations can provide a description of the problems and needs of a community and the existing potentials and opportunities–which are important input for future program development.
2. ***Benefits***
   a. To identify the types of occupation in the community
   b. To identify the potentials and problems from several community occupations
   c. As a means to reflect for the community of the previous efforts
   d. To determine what type of activity feasible to be developed in the future
3. ***Types of information that can be collected***
   a. Occupations in the agriculture field such as dry crop plantation, farming, rice fields, garden and fishery
   b. Non-agricultural occupation such as food industry, hand crafts, and so on
   c. Services such as, rice field labor, transportation and so on

4.2.5.7 The Venn Diagram

1. ***Definition***

   The Venn Diagram is used to study the relation between institutions, whether between the community and the institutions or with other certain parties that influence the life of the community. The result of this information gathering will show how big is the influence and closeness of the relation of a certain institution with the community and the influence of benefits and roles of various organizations in the village (local or central government org.), based on the view and judgement of the community itself
2. ***Benefit***
   a. To learn more of the existence, benefit and role of various organizations in the village (RW 09 and 14), local, central-governmental or even non-governmental organizations
   b. Study the interaction between those organizations and create a diagram that shows how big is the influence and closesness of the relation between the organizatin with the community
3. ***Types of information that can be collected***
   a. Information on various organizations already recognized by the community
   b. Information on the roles of those organizations to the community

4.2.5.8 Matrix Ranking

1. ***Definition***
   Creating a ranking matrix is to analyze a number of topics that were already identified. The objective is to find the priority between problems and select the most feasible alternative solution suitable with the local conditions. This technique can encourage and promote the intellectual capacity of the community in order to select their solutions and gather definitions of them.
2. ***Types of information that can be collected***
   Perception, assessments, considerations or criterias believed to be important by the community.

4.2.5.9 Organizing the Problems and Potentials

1. ***Definition***
   This is one of the stages in PRA that organize various problems that occurred previously identified by other techniques. These problems are arranged and organized based on the priority of their resolution. With a clear problems priority, future activity planning will be more directed
2. ***Benefits***
   a. Arrange all the information (problems and potentials) into one efficient arrangement
   b. Gather cause-effect relations between various problems
   c. Determine the priority problems that need to be resolved first
   d. As a means to raise community awareness of the problems the face
3. ***Types of information that can be collected***
   Organization of problems and potentials with emphasis on the process of existing-information gathering from previous PRA techniques.

In addition to the techniques described above, there are other techniques that were discovered spontaneously, which are quite relevant to gather additional informations, they are: (1) *flow chart of the community reaction* in facing flood disaster. The benefit of this technique is the identification of the rescue pattern of the community, both by using their own capacity or by asking for assistance from external parties (neighbours and local government, etc.) that should care for them, and (2) the *technique of analyzing flood causes* both technical and non-technical according to the perception of the community. The benefit of this technique is to see the extent of knowledge of the community of flood disaster causes in teir area.

Documentation of the discussion results, PRA activity results will be documented in detail covering every oppinion in the community, not just the topic of 'flood disaster mitigation' but also other things that are considered important.

4.1.6 COMMUNITY TRAINING IMPLEMENTATION

4.2.6.1 Preparations

The preparation activity covers the following:

a. *Training*, conducted on the 20th and 21st January 2001. This training involves the people from RW 09 and RW 14, kelurahan officials, DM Taskforce, and the LKMD of Kelurahan Cisaranten Kidul that will attend the PRA, in order to make the parties involved in the PRA implementation to become more familiar with each other at the D-day.
b. *Establishing the PRA Team*, participants that had been trained are groupen in a PRA team consisting of people with various education background and experience, men and women, various level of social-economy, not only from the program planning organization (the IUDMP), but also representatives from the community (of RW 09 and RW 14). This team will unite their perception in order to maintain unity of the team. This team will also have distributed works: some will become moderators, process observer, participant observer, documenter and translator.
c. *Determine the objective of the PRA*, the established team determines the objective of implementing PRA, which is to identify the potentials and problems in the community of RW 09 and RW 14 of the Cisaranten Kidul Kelurahan in flood disaster mitigation and the mission of educating and empowering of the community.
d. *Establishing the PRA Activity Design,* after the objective had been determined, the team will continue by formulating the general plan of PRA implementation starting from determining

information needs, selecting and arranging the PRA techniques, determining the source of information, and creating a temporary schedule. It was decided that the PRA activities in both those RW will be conducted every Saturday and Sunday (beginning in January to March 2001) to avoid disturbing their business/occupation schedule.

e. *Preliminary Visit*, the PRA team made a preliminary visit to get permission to hold the activity, get acquainted with the people, explain the objectives, identifying the participants and collecting secondary data (that were also discussed with the community). These data are intended to create a preliminary description of the kelurahan Cisaranten Kidul especially of RW 09 and RW 14. The source of data are documents from the kelurahan, photos of flood disaster occurrence, kelurahan map, flood disaster map from the MAWILHANSIP and the kelurahan, and so on.

4.2.6.2 PRA Implementation

Activity 1 (socialization)

After all the PRA preparation activities have been completed, the team made a field trip to start the PRA activities. The activities conducted during the trip are:

Discussion of the objective, target and process of PRA. This activity commenced with the rediscussion of the objectives, targets, and process of implementing the PRA techniques. These topics are presented to the community and local government to encourage them to actively participate and support the PRA activities and avoid any miss-perception of the teams arrival as outsiders of the community.

Activity 2 (Study of the problems and potentials of RW 09 and RW 14)

Information gathering discussion, after the community understands the objective and target of the PRA, discussions are held to gather informations. Informations that were recorded are topics on flood and community efforts implemented to mitigate it. Those topics are described, studied, analyzed, and concluded especially on the problems and potentials. This act of information gathering is done by using PRA techniques.

PRA techniques are tools to condition the village/kelurahan/RW. These are *visual* techniques (using illustrations) used as a media for community discussion on the conditions of themselves and the environment. These *visual* tools are collective ***learning media***.

4.2 IMPLEMENTATION OF THE PRA ACTIVITY IN THE STUDY LOCATION

4.2.1 PRA ACTIVITY IN RW 14

PRA activities by using PRA techniques implemented in the CBFM program are conducted in the following manner:

Time : Saturday, 27 January 2001 (16.00 – finish)
Place : house of Mr Uba

The introduction of PRA (Participatory Rural Appraisal) took place after the official opening of the event. PRA is the effort to understand the condition of the local environment where the people currently live in. The indoor activity results in the identification of local history plot, seasonal calendar, reaction flowchart, daily activity list, etc. whilst the outdoor activity consisted of *transek* (field trip) and mapping or sketching the location. PRA aims to identify the potential problems through the people to create a program.

This assembly was attended by only 24 people from all over RW 14 and only discussed the history plot and daily activities. The following is the history of floods that ever occurred in Riung Bandung according to the people of RW 14.

Table IV.1
History Table

Year	Description
2001	Flooding occurred in RT 2, 4, 5, and 6. In general water flooded houses and reached ± 15 cm. The water was oily and with unpleasant smell. The water was

	mostly originated from RW 13, 10, 3, and 2. In RW 14 the rain poured heavily and water flowed to the Darwati Kelurahan.
2000	• Rain at every end of the year. High precipitation cause ± 60 cm flood. • With the completion of the Kelurahan office and local warehouse buildings, the floods are increased in RT 2, 3, 4, and 6 of RW 14. These areas was once water pouches. • Flooding occur every time it rains and sometimes even when it doesn't. • The effects are: dengue fever, typhus, cholera, and skin diseases.
1999	• Annual flood struck in RT 4, 5, and 6, water reaching ± 60 cm. • Conflict between people that suffered with land owners/workers • Diseases are worse with more than 14 people hospitalized • This annual flood occur after both normal or
1998	• Flooding occurred for 3 full days and nights with water level reaching 70 cm and with many people suffering from skin diseases, cholera and dysentery. • During this year many conflicts occurred especially with the developer of Riung Bandung area, including the local government officials. • Foundation construction in RW 13 • Cisaranten dike collapsed. • Temporary anticipation was taken by making temporary embankment using sacks of sand/earth. • The river was embanked using bamboos and sand/earth sacks that were donated by the kelurahan and the people. The work was done together by the people of RT 3, 4, 5, 6, 7, 8 RW 14. • The losses suffered by the people covered damaged furnitures, houses, and some roads in RT 4, 5, 6 were totally ruined
1997/1996/1995/ 1994/1993/1992/ 1991	• Floods reach approximately 70 cm and endured for 3 days and 2 nights during the wet season • Epidemic diseases included chicken pox, dengue, cholera, malaria, typhus, scabies, and skin infections. • Clean water facilities were polluted. • Water ducts were non-functional. • The river shallowed and narrowed (Cisaranten area)
1990/1989/1988	• Flood had not reach houses, only on roads. Not as severe. • The development in Riung Bandung did not consider water conveyance problems.

Note: all members of RW 14 originated from outside of Bandung and have occupied the area since 1988.

After the history plot has been constructed, the people received queries of their daily activities during the wet and dry season or during floods. In general, activities are normal during the dry season. Some go to school or work while the women do their domestic tasks. When a flood occurs, the activities are increased with the addition of water disposal from houses and staying on guard for heavy floods. Some activities that could be done in normal times, cannot be accomplished due to the flood, such as doing the laundry, or even their jobs. Their time is consumed by cleaning their houses. Fortunately most children continue to go to school despite the flood. Fortunately most of the children still attend school although in flooded conditions.

One member of RW 14 suggested the following:

- If the people in Riung Bandung area wish to reduce the floods, the areas between Gedebage to Rancabayawak must have a water containment pouch. This area was once a water pocket.
- Rice fields must have at least informal irrigation.
- In 1997 the flood lasted for one week while 1998 was the worst flood occurrence ever recorded. Unfortunately the geography of RW 14 is a basin.
- During the floods, the people have trouble to defecate.

Date : Sunday, February 4th 2001, 10.00 AM
Place : RW 14, Cisaranten Kidul Kelurahan (house of Mr. Uba)

This meeting was attended by 15 people from RW 14. The agenda was to make a flow chart of the reaction from the people when they have to face floods, define seasonal calendar, and Venn-diagram.

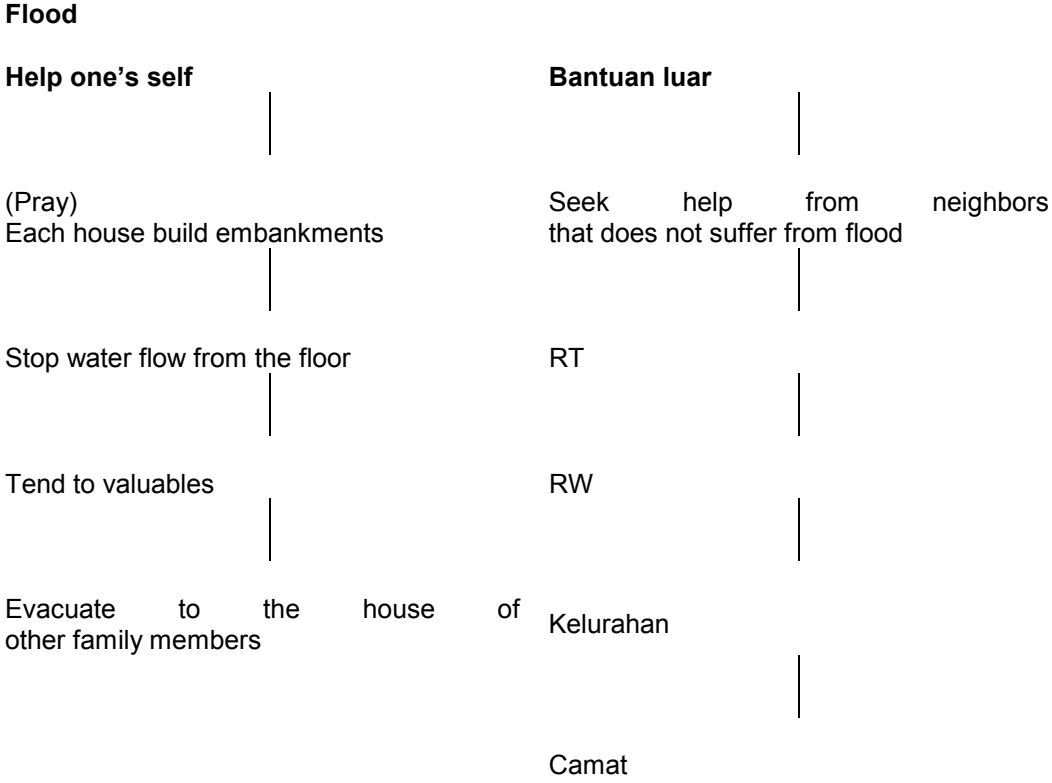


Figure 4.1
Flowchart of the People's Reaction when Confronted with Flood
Sunday, 4 February 2001

Table IV.2
THE CAUSE OF FLOODS ACCORDING TO THE PEOPLE OF RW 14

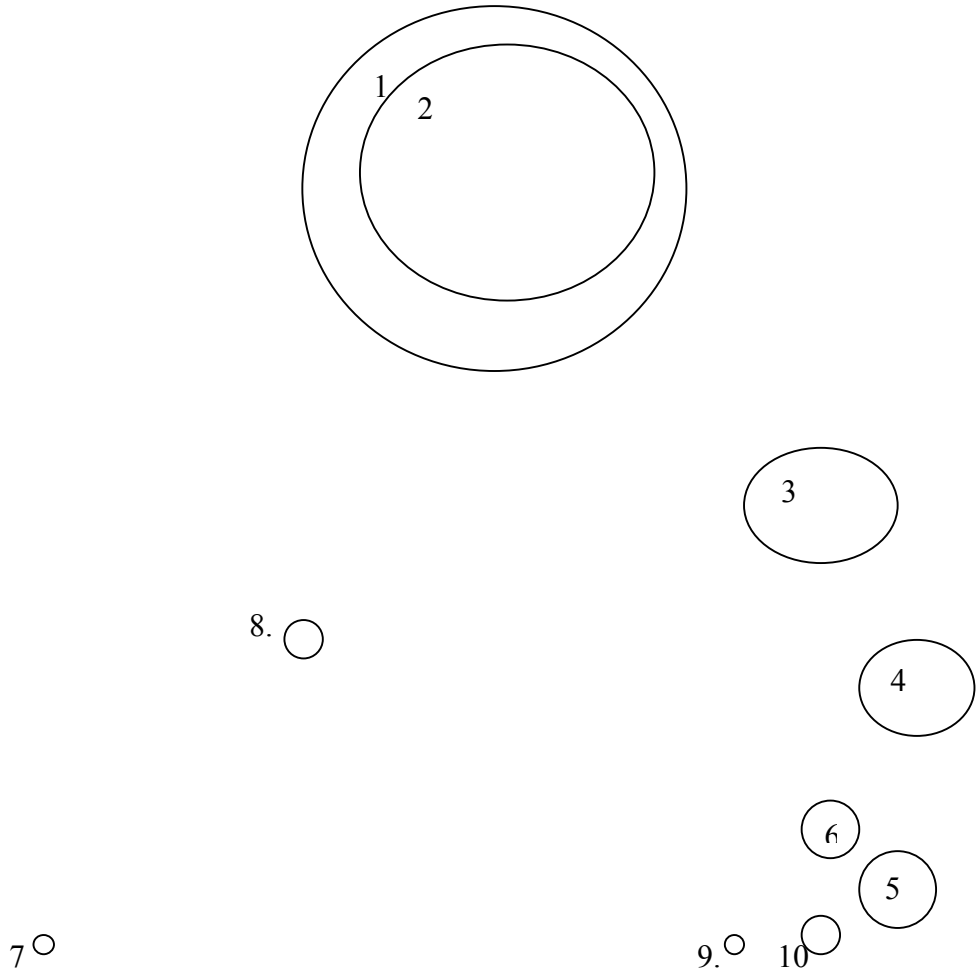
Technical Cause	Non-technical Cause
1. High precipitation	1. Careless disposal of garbage
2. Water derived from Ujung Berung to Riung Bandung	2. Lack of consciousness for drainage maintenance
3. Water canals are small and shallow	3. Conflict of interests (the residents against crop workers in water distribution)
4. The houses located upstream are higher	
5. The river is actually higher than the houses	4. The developer built without designing proper drainage canals
6. There is no main water canal	
7. There is no drainage canal from Riung Bandung	

Flood Causes
- It is not clear whether the upstream area of Riung Bandung have a primary canal or not

- Water came from Mount Manglayang that is becoming more barren, down to Ujung Berung, Gedebage, RW 13, and RW 14
- The people of Riung Bandung carry out proper waste disposal, unfortunately other people do not replicate
- One of the rivers was dammed for irrigation. After it collapsed, it was never rebuilt. The embankment of the main river (Cisaranten) also collapsed and floods occurred because it was never fixed
- Illegal construction projects blocked the canal. In 1988 there was a large canal near Riung Purna. In 1991 the canal was obstructed and had to circle around due to real estate constructions
- In Riung Purna 10, water flow is obstructed causing flood to occur.

Figure IV.2 Venn Diagram by RW 14

Sunday, 4th February 2001



Legend:

1. The community of RW 14
2. RT : Quick to respond, very important role, pro-active
3. RW : Might ask for reward, passive, not quick enough to respond
4. Lurah : Rarely visit the fields/directly gets involved
5. Camat : Rarely visit the fields, gives only promises
6. LKMD : Give only hope
7. Mawil Hansip/Wahyudin : No interest
8. Satgas (task force) : No interest
9. Irrigation Div. of PU : Give only hope
10. Developer of Riung Bandung : Irresponsible
11. LSM : Give only hope
12. Kotamadya : Give only hope
13. Jasa Marga : No interest
14. Container Terminal : No interest
15. PMI : No interest

16. Factories : No interest
17. Developer (Adipura & Bandung Inten) : No interest

Table IV. 3
Transek RW 14

Route/area	Block K/high ground	RT 04, Riung Purna XI Street	RT 05, Riung Purna XI Street
Land-use	Rice fields and houses	Houses, empty fields	Houses
Flood description	±50 cm with strong discharge	±50 cm with strong discharge	The worst
Physical damage	Houses and valuables	Houses and valuables	Houses and valuables
Potential	There is a ± 4m river in RT 08/RW 07	• There is space available to build a drainage canal in front of the new office of the kelurahan • There is water containment area (pouch)	-
Problems	The water canals narrowed due to buildings/ conflict of distribution	• The floor of the buildings/bottom of canal is lower than the roads • Canal capacity isnot enough causing water to run to RT 04 because canals in other RT are blocked/closed	• Elevation difference between the main river and its derivatives • Two canals were dammed for irrigation by farmers but were never restored
Alternative Solution	Create a new canal, sacrificing rice fields	• Construct canals in other RT • Create new canal in front of the kelurahan office • Raise the floor of buildings	Build embankment at least 452 meters along the river banks

Additional notes:

- The main problem in RW 14 is sedimentation. Without a main canal, the rivers/canals are narrowed and conflicts surface between the rice fields with the residents. The drainage channel, a BUDP project, in Cikapundung River flows into the area of Tegalluar Village, which is planned to become an artificial lake.
- Based on the transek (field trip) in RW 14, there seem to be no drainage canal behind RT 04. There is a pipe with a thickness of 3 inches, located in front of the Kelurahan office, which is intended to divide water flow two ways.
- Also in front of the Kelurahan office, there is a warehouse that does not have sewers to convey water.
- The water canal in RT 04 stops at the end of the road.
- The derivative river is dammed due to conflict of interests

Conclusions:

- The drainage system does not function at all
- Buildings cause canals to tighten

Date/time :Sunday, February 18th 2001 at 11.00 – finish

Place : RW 14, Kelurahan Cisaranden Kidul (house of Mr. Uba)

The third assembly is the final gathering and completes the previous PRA agendas. In this meeting the people did the AMP (Analisis Mata Pencaharian = Job analysis), organize problems, made a ranking matrice and develop a work program based on priorities. This meeting was only attended by 4 people from RW 14 who represented all the participants that previously attended the assemby.

Table IV.4
Occupational Analysis of RW 14 (18-2-2001)

Occupation	Work Class	%	Level of disturbance/ flood effects	Time wasted by flood occurrence		Notes:
				Individual (%)	Environment (%)	
PNS (Government employee)	Class III, average	10	33% PNS during the flood do not attend work	100	30	PNS could not go to work because they have extra work to do due to the flood (33%)
Private employee	-	25	-	100	50	These people can either go home early or late from work
Self-sustained • Traders	-	20	80 % of them are interrupted	100	50	During the wet season these people suffer deficit because they cannot use their buildings
Retired	-	40	-	100	15	-
Unemployed	-	5	-	100	50	-

4.2.2 PRA ACTIVITY IN RW 09

Date : Sunday, 28th January 2001
Place : RW 9 Kelurahan Cisaranten Kidul (house of the RW chief)

The PRA activity in RW9 was attended by 18 people and covered many such as history plot, daily activities, reaction flowchart and seasonal calendar. The following is the description of the activities.

- History Plot

The history of floods according to the people of RW 9 is as follows.

History Plot according to the people of RW 9

Year	Description
2001	1. 50 cm flood in RT 01, in RT 02 approximately 30 cm. 2. A school-aged child was swept by the flood but was rescued in the end. 3. Plenty of fish in the river that were carried by the flood but were polluted and almost poisoning the people that consumed them causing diarrhea. 4. Approximately 30 Ha of rice fields, which were ready to be harvested, were destroyed by rats. 5. Animals were paralyzed. 6. Garbage and mud accumulated and got into houses. 7. People could not cook normally and had to move to the attic to do it. 8. Sleeping could only be accomplished in mosques 9. Lack of clean water forced people to buy bottled (mineral) water. 10. Schools had to be canceled due to the roads and buildings being submerged by flood. 11. People suffered from skin irritation. 12. The mosque in RT 01 was submerged in water. 13. Plenty of mosquitoes. 14. Roads/gangs were damaged. 15. Strong winds 16. Rice fields workers could not attend work. 17. Fish ponds were flooded and the fish were lost.
2000	1. Floods reached 70 cm, the main road was submerged, 3 bridges got was also submerged in water. 2. Houses in rt 01 and 02 were flooded by approximately 40-60 cm. 3. The people of rw 09 evacuated to bumi pitaloka. This disaster lasted for as much as 46 days. 4. Diseases consisted of skin irritation, diarrhea, and typhus. 5. Rice fields and fish dams were washed away by flood. 6. Religious places were submerged, bred chicken and ducks lost, rice fields that were almost harvested were submerged and destroyed. 7. House walls deteriorated. 8. The roof of many houses were blown away by strong wind. 9. Furnitures had to be raised. 10. The people gave suggestions to the local government (dprd tk. Ii) regarding the floods. 11. People came to jasa marga for compensation of the effects of the construction of the toll highway. 12. Aid from pmi bandung came late.
1999	1. Casualties of the flood reached 3 people. 2. Similar with case no. 1 to 9 of the year 2000 3. Excavation of the rubbish that blocked the embankment of cisaranten river. 4. Excavation of both cisaranten and cinambo rivers. 5. Evacuation (elders and babies) using traditional ways. 6. Food were provided by the kecamatan (sub-district) for two days only while the flood itself lasted for 46 days. 7. People had trouble finding clean water to drink and had to buy water. 8. Occupation were totally stopped (rice fields workers, construction labor, and trading).

1998	1. Rice fields could not be harvested because they were covered in mud from the flood. 2. Same as above
1997	1. A child was carried away by the flood. People searched for one week aided by the SAR team. The child was found south of the toll road, in Cinambo river. Compensation was provided by the lurah of Cisaranten Kidul. 2. Same as above
1996	1. Floods occurred but did not reach the houses, only as far as over flowing river and submerged rice fields
1995-1987	1. The flood from Cisaranten river was caused by weathering and the accumulation of rubbish in the river from the people and industries. 2. Floods due to construction of Padaleunyi Toll road.

- Reaction Flowchart

Through this flowchart, we wish to know the reaction of the people when facing flood disaster, starting with helping themselves up to the point of seeking help from outside.

A. Self assistance

In helping one's self there are procedures that they follow such as:

1. Pray.
2. Prepare/pack important things (valuables, important documents, etc).
3. Observe the weather to watch the development of flood.
4. During the flood people sought higher ground, move to attics or build raised platforms to store valuables.
5. Wait for the situation to be safe to return home.

B. Seek assistance from outside

To help themselves, the people of RW 09 also sought out aid from outside through the following procedures:

1. For first aid, the people and RT chief reported to the RW chief.
2. the RW chief reported to the kelurahan
3. from the kelurahan, they go to the sub-districts for sacks. They also seek help from other organizations such as PMI, social department, Jasa Marga (in 2000) and other related organizations.

- ***Seasonal calendar***

There are somethings that must be noted about the seasonal calendar, which will be exposed below while the seasonal calendar result is described in the table following the notes.

Notes from the table:

- Farming is dependant on rain water.
- They start planting in May. If it rains, it might disturb the string of activities due to flood.
- Harvest time is not predictable, according to the season and flood (if it doesn't rain from May to August, the rice fields yield harvest.
- They start breeding fish in September the results are unpredictable.
- Most livestocks are bred-ducks.
- If it does not flood and there are no rat attacks, the rice fields yield 3 tons/ha.
- By product of the flood is fish.
- Most people are rice fields workers (around 90%) and construction labor.
- The men work as costruction workers and the women sell pindang (fish or meat in some-kind of curry).
- The men account for 50% of the population, which is around 60 people.
- Most of the women are housewifes.

No	Activities	1				2				3				4				5				6				7				8				9				10				11				12			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Dry season																																															
2	Wet season																																															
3	Floods																																															
	a. minor																																															
	b. major																																															
4	Harvest																																															
5	Fish																																															
6	Livestocks																																															
7	Income																																															
	a. primary																																															
	b. secondary																																															
8	Working periods																																															
	a. male																																															
	b. female																																															

- *Daily Activities*

The daily activities differ in the wet and dry seasons. During the wet season, people are generally concerned for they have to protect their valuables and cannot attend their normal activities, although some people turn to fishing during floods

Date : Saturday, 3rd February 2001
Place : RT 01/RW 09 (house of the RT 01 chief)

This time, the PRA activities are accomplished by separating the women and the men. The men mapped flow of water from upstream (result is enclosed) with a number of notes, while the women did the history plot, daily activities, defining flood causes, and making Venn-diagram according to their opinions.

1. History Plot

According to the women, the history of floods in the area is as follows.

Table IV.6
History Table for Flood OccurrencesAccording to the Women of RW 09

Year	Description
1980	No flood
1985	Land fills started, ended in 1990
1990	Floods reached more than 50 cm. Livestocks washed away, skin diseases, cholera, cough, fever and eye irritation. Food aids are insufficient (aid from the government/subdistrict came late)
1995	Floods worsen, reaching 60 cm, 2 casualties
2000	Many floods occurred

2. Daily Activities

The daily activities during floods, according to the women, are as follows.

	Men	Women	Children
Flood	1. Find higher places to sit 2. Tend to their valuables 3. Clean the trash that accumulated 4. Observe the situation	1. Cook 2. Watch TV 3. Clean the mud/trash that accumulated	1. Play 2. Schools are cancelled

3. Cause of Floods

According to the women of RW 09, the cause of the floods can be summarized in the following table.

Technical cause	Non-technical
1. Toll road 2. Expansion of residential areas (due to the landfills) 3. Other buildings (rice fields, container terminal, factories) 4. Factory wastes are transported into RW 09 5. The river/water canals are too tight	People throw rubbish where they should not (indisciplined)

The expectations of the people, represented by the women of RW 09, are as follows.

1. The river needs to be widened and excavated.
2. The roads/gangs to the residential areas need to be strengthened using asphalt/concrete
3. Temporary aid is not sufficient
4. Prioritize the surrounding people to work in the factory located in the area (pt. Kharisma)

4. Venn-Diagram

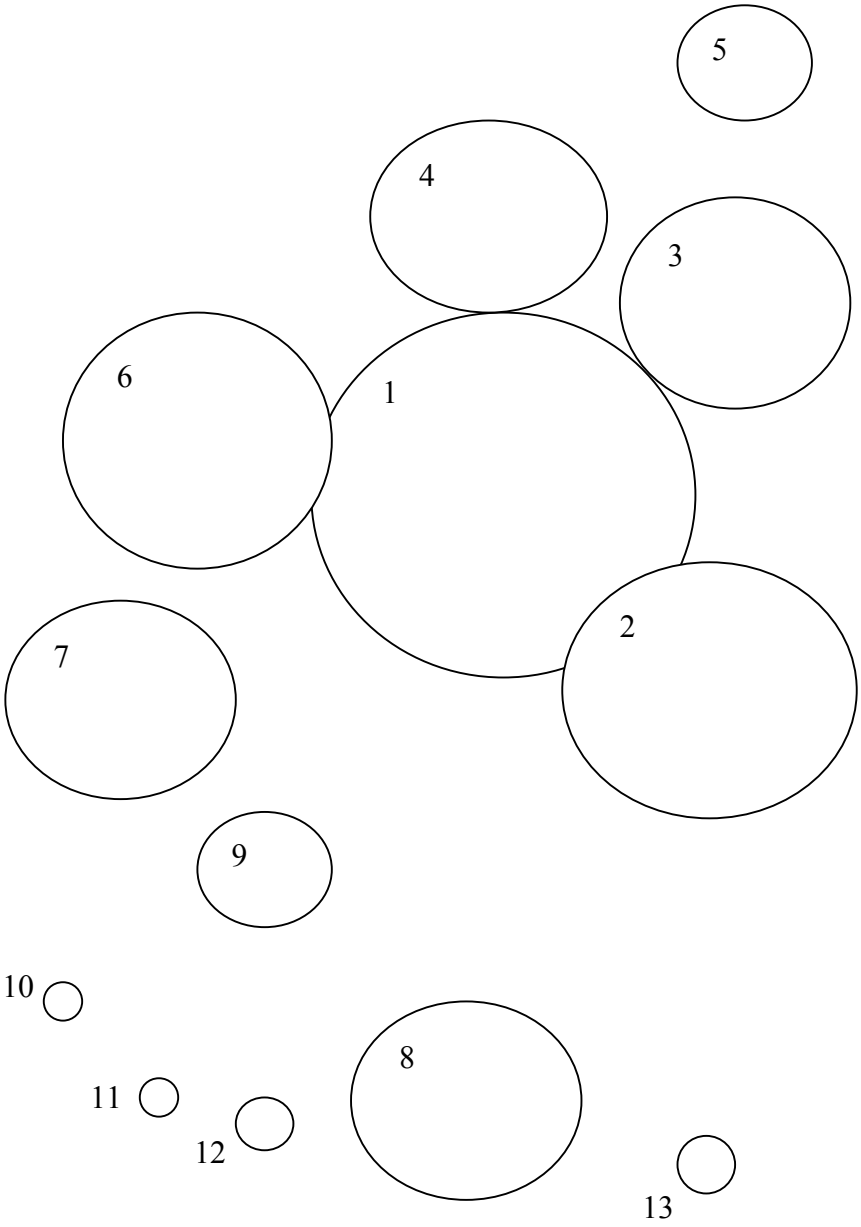
In this activity, the women confirmed parties that are directly or indirectly related with the problems they face. The following table lists the parties along with some notes on their behavior according to the women.

A few notes, as the result of the Venn-diagram, such as:

- Once in 1997, the women received food from the Kotamadya office during the monetary crisis
- The wife of Camat has never visited RT 01 nor attend ‘Dharma Wanita’.

Figure IV.3 Venn Diagram from RW 09

Sunday, 4th February 2001



Legend

1	The Community of RW 09	
2	RT 01	Stood up for the people (positive)
3	PMI	Concerned for the availability of food and medicine
4	Bintang Agung Factory	Provided clothing and medicine
5	Kelurahan (chief)	Does not care enough for the people of RW 09
6	Jasamarga	Provided much assistance (money, food) in certain RW
7	RW 09	Plenty of good services but not close with the people

8	Pikiran Rakyat (daily newspaper)	Provided rice to help, clothing and second hand goods
9	Camat	Does not/lack care
10	Kharisma (shoe) factory	No interest
11	Mawilhansip	Provided assisance but came too late
12	Adipura Real Estate	No interest
13	Kotamadya	Does not care (lack attention)

5. Mapping

The mapping activity resulted in the map (attached) of water flow and some information/notes from the people (men), which are:

- Gedebage area has never experienced development
- Development is not complete nor is it evenly distributed (for farming and irrigation)
- The river in Rancabayawak can no longer hold water
- The river/water duct is sedimented and narrowed thus must therefore be excavated and widened
- The number of families in RT 01 and RT 02 is 65 families each, bringing the total number of families in RW 09 to 130 families
- Once flood in RT 01 lasted for 43 days and 30 houses were submerged in water while in RT 02 it lasted for 14 days with 15 houses submerged.

Date(s) : February 11th and 17th, 2001
Location : RW 09, Kelurahan of Cisaranten Kidul

This time, the PRA activity is held twice in February 11th and 17th, 2001. the agenda consisted of '*Transek*' (field trip to trace the watercourse). In February 11th, the transek was done only at the area across the toll road. During this visit, a number of problems emerged, such as: there appear to be three drainage canal that discharge into one canal in Tegalluar. For more details, the results can be observed in the Field Trip Table, combined with the results of the February 17th field trip.

Table IV. 9
Transek

	Area across the Toll road	RT 02/RW09	RT 02/RW09 (± 60 Ha)	RT 01/RW09	Rancasepat, Rancapaciing, RW 07 and RW 08
TGL (Land use)	• Pond (used to be a rice field) • Toll road (also as the city boundary) • There is one culvert found	• Ponds • Residential area • River	• Rice fields • River • Residential (mosque) • Motor-taxi terminal • Serang • Fish ponds • River estuary	• Residential area construction • Existing housing area • Rice fields • Rivers • Fish ponds • Graveyard	• Ponds • Rice fields • Graveyards
Status	Private property	Private property	Private property (SHM=legalized)	Private property (SHM) per one family	Private property
Flood description	Never experienced flooding	approximately 75 cm and lasted for about 15 days	• Water depth 1.5 – 2 m • Duration: 15 days • Sediments from the flood reach 0.5 m	• Water depth 1.5-2 m • Duration: 15 days • The sediment reach 0.5 m	-
Flood effects	-	Furniture damaged/ruined by flood	• Floods • Rice fields transformed to other functions	• Floods • Rice fields transformed to other functions	-
Problems	• There are 3 drainage canals: the Cinambo, Rancakuntul and Cipamokolan Rivers, that empty into only one canal in Tegalluar • There is permanent embankment, the concrete residue has not been excavated	• The river is higher than the houses • There are 4 houses not yet filled (using sand/earth)	• For RW 09 kirmir water reached ± 1.5 m • Garbage and sediment accumulation • Without toilets, people dispose wastes directly to the river • Polluted water cause skin diseases • There are dangerous animals (ie. Snakes)	Floods	All the canals narrow
Potential	-	-	• Place to herd ducks	There are fish ponds	-

			• Everyone received 4 – 50 Kg of fish during floods (gold fish, sepat, etc.)		

Other informations gathered during the Field trip are:

- In the 1990's mud brought by the floods accumulated up to 50 cm in houses.
- Before the toll road was constructed, there were houses that were raised 10 cm, yet is still submerged during the flood.
- During a flood, some people evacuate, especially women and children.

A perfect example of the above cases is the house of Mr. Maman in RT 02.

- Currently, the river is much higher than the rice fields. The river used to be only 2 m above the fields with a width of 8 m, now it is only 2 - 3 m wide.
- The river is polluted by factory wastes. According to information gathered, the polluted river has four colors: yellowish, bluish, white, and black.
- Bimantara bought some land but cancelled its consruction. People went to plant in this land with 60% profit for the farmers and 40% for the owner.

Other than the field trip (transek), another agenda that was accomplished during this activity is the AMP (Analisa Mata Pencaharian = Occupational analysis). The results are presented in the following table.

Table IV.10
Occupational Analysis of RW 09 (2001)

Job description	Quantity	Components required		Operational cost
		Quantity	Price	
Rice field labor	700 tumbak (= 1 Ha)	25 Kg of rice seed @ Rp. 2600	Rp. 65.000	2.5 Kg urea fertilizer = Rp. 450.000; 90 Kg TSP = Rp. 244.000 2l of Basulin = Rp. 150.000 Work force= Rp. 700.000 Equipments = 1 tumbak @ Rp. 500 = Rp. 350.000 TOTAL = Rp. 1.894.000
Breeding ducks	50 ducks	50 ducks @ Rp. 40.000	Rp. 2.000.000	Konsentrat (duck food) = 5 Kg x 14 = 70 x Rp. 1.200 = Rp. 8.400 Work force = 14 days x Rp. 12.000 = Rp. 168.000 Cages = Rp. 150.000 TOTAL = Rp. 402.000
Fishery	1 kolam for each hectare	Kebul (40 Kg) x 300 ekor = 12.000 Kg @ 15.000	Rp. 600.000	Work force = 90 x Rp. 12.000 = Rp. 1.080.000

Table IV.11
Occupational Analysis

Output	Difference (vs. production cost)	Problems	Potential	Notes
1. If things go well the yield is = 7 ton x Rp. 1.000.000 = Rp. 7.000.000 2. If pest	1. If things go well, profit is = 7.000.000 – 1.894.000 = Rp. 5.106.000 2. If pest attack/flood occur, there	1. The land was sold to Bimantara and Adipura 2. The people are only workers and not owners 3. Rats 4. Floods	The rice fields can be rented	1. Workers and owners share profit 50-50 from gross income, while the initial cost comes from the workers 2. From 1980-now,

attack/flood occur, there will be no harvest	will only be deficit	5. Wereng (rice pest)		1 Ha yields an average of 1-2 tons (gross) 3. Most rice fields are transformed into something else
1. Egg = 25 x 90 days @ Rp. 600 = Rp. 1.350.000 2. Ducks = 40 x Rp. 15.000 = Rp. 600.000 TOTAL COST = Rp. 1.950.000	Difference (gross profit) is = Rp. 1.950.000 – Rp. 2.402.000 = (-) Rp. 452.000 = no profit (deficit)	1. Initial cost 2. Konsentrat is expensive 3. Draught cause death due to dehydration and many diseases strike	1. Vast area to herd the ducks 2. Many traditional duck food available (ie. Gold snails)	
4 Kg x @ Rp. 6.000 = Rp. 24.000	Rp. 2.400.000 – Rp. 1.680.000 = Rp. 720.000 Monthly gross profit is Rp. 240.000	1. If a flood occur, the fish are washed away 2. Factory pollute water causing all the fish to die	1. Abundant source of natural fish food 2. Easy to sell	

Beside the occupations stated above, there are also secondary occupations, such as:

- Labor
  - Daily income reach Rp. 25.000/day for workers (for 35 days)
  - Daily income reach Rp. 10.000/day for '*kenek*' (public transport crew) x 35 days
  - Construction workers work using contract system for 35 days. They usually get two orders per year giving an average of 14 work days per month. Unfortunately there has not been many construction projects.
- Rice field workers
  - One month of work for each plantation period with a payment of Rp. 10.000/day
  - There are 2 plantation period in each year
- Garmindo Factory labor (shoe factory)
  Mainly teenagers with monthly salary around Rp. 345.000, working 6 days per week.

Other problems that were encountered:

- For the adults, breeding ducks need at least 100 ducks, which would require around Rp. 5.000.000 initial cost.
- Rice fields and fish ponds are all dependant on the reparation of the water canal to contain water during the floods.
- Unemployment in RW 09 is classified as covert unemployment, meaning that the people sometimes work as construction workers.

4.2.3 RESULTS

4.3.3.1 Workshop at the RW Level

Presentation of the discussion results, the results of PRA were arranged into a summary and presented to the RW and discussed with the community. The results from each setiap PRA technique were illustrated on large papers that were adhered onto the walls of the meeting venue. Everyone of the discussion participants (the community) examined those techniques and discussed all the potentials and problems after which they organized them into a program (see attachment: data of each technique).

Developing a Program Plan, problems were arranged according to their priorities, while existing potentials were listed—from both RW 09 and RW 14 and from outside such as the possibility of a donor—that could be considered in developing the program alternative. The programs that were

developed are expected to be able to solve the problems they had previously listed (see attachment: program development data).

The development of the program or project plan is the formulation of real life actions that will be implemented in a certain period of time, which can be done at the level of groups, RT or RW. These activity plans are used for consideration for the programming organization (Center for Research – ITB) and donor organizations (ADRC – Jepang) in determining aid for the program for flood mitigation in RW 09 and 14 of the Cisaranten Kidul Kelurahan, Rancasari Sub-district in the city of Bandung, based on the priority determined by the community itself.

The development of these programs aim to: 1) provide a concrete and clear work plan as a guidance for follow-up actions that can actually be implemented, and 2) summarize the problems analysis results and identify the alternative problems solutions based on the available resource (potentials).

The information is gathered by organizing problems and potentials and emphasize on the process of gathering existing information from the results of the PRA techniques that have been implemented. As shown in Table IV.12 and Table IV.14, the process of formulating these programs is started by defining the topic, or outline of problem. The problems are described, as shown in the problem column. The community is then asked to identify the causes and potentials.

Based on those four fundamentals (topic, problem, cause, and potential), the community will determine the alternative program. Should there be five topics identified, that means that there should also be five alternative programs, such is the development of programs in RW 14. Likewise for RW 09, where 16 programs were developed.

Determining the Priority Scale was done by the community, by assessing: 1) the nature of the program, that is whether the results will affect many members of the community; 2) urgency level of the program, and; 3) the implications of the program to increasing the income of the people. In the assessment, the community had to give a score between 1-10. A 10 indicates the highest level, while a 1 show the lowest priority. The scores from the three categories are totaled to find the highes and lowest score. The results of this activity are presented in table IV.13 and IV. 15.

Priority Ranking, which is arranging the programs into a singular list. The community reassess, if there are several programs that have the same score, to determine the one more prioritized.

Table IV. 12
Developing Action Plans in RW 14

No	Topic	Problems	Cause	Potential
1	Narrow residential drainage canals	• Unclear flow line • Water inundation	• Developer built improper drainage • Imperfect design • Obstructed water conveyance • No final dumping area • Insufficient funding • Spirit of '*Gotong royong'* decreases	• The spirit of '*Gotong royong*' • The water channels can still be widened and excavated
2	Main canal	• Does not collect runoff water/not functioning	• The canal is situated higher than the houses	• The water canal can still be widened and excavated
3	Alternatif Canal I (moderate size), beside the residential area	• Does not restrain water from upstream • Water gets into houses	• The canal is too small, shallow and narrow	• There is still available space to enlarge the canal • Required human resources is available
4	Alternatif Canal II (near the terminal)	• Cannot convey/contain water	• The upstream is lower than the downstream	• Space to enlarge the canal can be purchased

			• The earth under the canal is unstable	• People can be utilized to work through '*Gotong royong*'
5	Trash and mud	• Accumulation of mud and garbage in the canal cause flood	• Careless disposal of garbage/mud • Mud is carried by the flood • The roads are weathered by the flood • No regulations	• Available human resource • Make more regulations • Counseling from authorities

Table IV.13

Prioritizing Action Plans in RW 14

Alternative program	Experienced by many people	Urgency	Influence to income	Score	Ranking
• *Gotong royong* to enlarge residential drainage canal	8	8	5	21	III
• Excavation of drainage canal • Rearrange all the canals (from the residential area to the main canal)	6	7,5	4	17,5	IV
• Make *kirmir*	9	9	6	24	II
• Construction of *kirmir*	9	9	7,5	25,5	I
• Suggestion for regulations • Socialization and counseling	7	6	4	17	V

Table IV. 14
Organizing Action Plans in RW 09

No.	TOPIC	PROBLEMS	CAUSE	POTENTIAL	ALTERNATIVE PROGRAMS
1	Clean water (for basic needs, drinking, etc.)	- Polluted	- Factories dispose of their wastes carelessly	- Suggest the factory to carefully watch their wastes (issue waste disposal regulations)	1. Make deep wells
		- Ground water is unhealthy (yellowish, taste bad)	- The factory wastes polute the water	- The people can afford to buy water purifiers (Cittun, Chlorine)	2. Build public purifying tanks (for sanitation)
		- Unclean to use for bathing (causing dry skin)			

		- Sticky when used to wash			
2	Cisaranten River	- Unable to hold water in the wet season	- The river shrinks (narrows)	- The river can be widened and excavated (the area belongs to PU)	3. Expand the Cisaranten River
		- Obstructed by garbage pile	- The river is not deep enough	- City Health Department	4. Make Kirmir for the Cisaranten River
		- Floods/runs off to the residential areas/rice fields	- Garbage pile up (not enough care for waste disposal) from houses and factories	- Puskesmas	
			- The river meanders a lot	- Local government funds	
			- Obstructed by the toll road		
3	Health matters	- Skin diseases (after the flood), diarhea, eye irritation, coughs, flu, fever	- The flood water contain factory pollutants	- Gotong Royong	5. Mobile Puskesmas should be deployed to RW 09 during floods
		- (Note: the Puskesmas is far, doctors are unaffordable)	- Inundation lasts long	- Local government funds	6. Build public toilets
		- No biological (planted) medicine plants	- Waste water from houses		7. Promote Biological Medicine
			- Biological medicine cannot survive the flood		
4	Residential roads	- Becomes muddy and slippery in the wet season	- Holes are left as they are	- The river can be widened and excavated	8. Expand the road
	(RT 01 & RT 02)	- Too tight/small	- Road built using red earth/clay	- Local government funds	9. Use asphalt/concrete
			- The road is lower than the water level		
			-Floods		
5	Cinambo River	- The run off from Cinambo River floods RW 09	- The river shrinks (narrows)	- There are many factories near RW 09 (many RW 09 people are unemployed)	10. Expand the Cinambo River
		- The water from Cinambo River contains pollutants	- Sewers are obstructed (belonging to H.	- The ability to breed ducks	11. Construct Kirmir

			Munajat)		
			- Obstructed by the toll road	- Cisaranten River restoration/expansion will help all economic activities	
				- It is possible to cooperate with factories in breeding animals	
6	Economy	- Low income	- The flood destroys rice fields, bred animals, fish ponds, and other source of income	- The people make good fish 'pindang'	12. Restoration/expand the Cisaranten River
		- Rice fields do not yield profit		(Notes: Ujungberung, Binong, and so on)	13. Promote breeding poultry (ie. Ducks)
		- Breeding animals yield no profit		- Some people can make fish nets	14. Promote selling fish 'pindang'
		- Fishery yield no profit		- There are also people who can plait	15. Promote selling fish nets
		- Many become 'covert' unemployed			16. Promote selling plaited goods

Table IV.15
Prioritizing Action Plans in RW 09

No.	PROGRAMS	URGENCY	AMOUNT OF PEOPLE EFFECTED	EFFECT ON INCOME	SCORE	RANKING	NOTES
1	Make deep wells	10	10	10	30	III	Public well
2	Build public purifying tanks (for sanitation)	10	10	8	28	VIII	
3	Expand the Cisaranten River	10	10	10	30	I	
4	Make Kirmir for the Cisaranten River	10	10	10	30	VII	
5	Mobile Puskesmas should be deployed to RW 09 during floods	8	9	10	27	V	
6	Build public toilets	10	10	5	25	IV	
7	Promote Biological Medicine	7	8	9	24	IX	
8	Expand the road	10	10	10	30	II	
9	Use asphalt or concrete	10	10	10	30	II	
10	Expand the Cinambo River	10	10	10	30	VII	There is already a plan from agriculture sector
11	Construct Kirmir	10	10	10	30	VII	The other side has already been constructed
12	Restoration/expand the Cisaranten River	10	10	10	30	I	Addition to program III
13	Promote breeding poultry (ie. Ducks)	8	10	10	28	VI	
14	Promote selling fish 'pindang'	9	9	10	28	IX	
15	Promote selling fish nets	5	9	10	24	IX	
16	Promote selling plaited goods	5	9	10	24	IX	

Identifying the program scale, this activity ends the session on Program Development. The community must identify the program scale, which are: 1) determining the target or the location and community that will experience the program, 2) identify the benefits that resulted; 3) determining the nature of the program, is it a new program that has never been implemented before, or is it continuing a

previous program that has been or is still being implemented, or is it a part of a rehabilitation activity, and 4) determine the cost of the program implementation, source of funding, the parties responsible for the program and year of implementation. In RW 14 the program scale is formulated into table IV.16, and for RW 09 in Table IV.17.

Table IV. 16
Perumusan Skala Program in RW 14

No.	Programs (priority-based)	Objective		Benefits	Characteristics		
		Location	Involved parties		New	Continue	Reheb.
I	Construct *kirmir* near the terminal	Terminal, Kelurahan office, Riung Damai Raya Street, and rice fields	RT 2, 3, 4, 5, 6, 7, 8, 9, and 12	Mitigate flood in RW 14, especially RT 2, 3, 4, 5, 6, and 12	V		
II	Construck *kirmir* (next to the residential area)	next to the residential area	RT 5, 6, and 12	Mitigate floods in RT 2, 3, 4, 5, 6, and 12	V		
III	Enlarge the residential canal (sewers)	In front of the houses in each RT	RT 2, 3, 4, 5, and 6	Mitigate floods in RT 2, 3, 4, 5, and 6			V
IV	Excavation of the main canal	Next to the Riung Bandung houses	The people of Cisaranten Kidul	Mitigate floods in Kelurahan Cisaranten Kidul			V
V	Suggestion to define and enforce waste disposal procedures	The people upstream of Cisaranten Kidul River	RW 3, 10, 13, 14 of Cisaranten Kidul and the people of Gedebage	Mitigate floods in the downstream area (Cisaranten Kidul)			V

Table IV.16 (continued)

Cost		Responsible parties	Implementation year
Estimated cost (in Rupiah)	Sources		
± 250.000.000	• 10 % self provided • PT Riung Bandung • Kotamadya Government • PU • Villages • Donations	• Community leaders • LKMD	Very soon (in 2001)
± 108.000.000	Same as above	Same as above	Same as above
± 50.000.000	Same as above	Same as above	Same as above
±	Same as above	Same as above	Same as above
±	Same as above	Same as above	Same as above

Table IV.17
PERUMUSAN SKALA PROGRAM IN RW 09

PROGRAM RANK	OBJECT		BENEFIT	ESTIMATION (Rp)		IMPLEMENTATION YEAR	CHARACTERISTICS			RESPONSIBLE PARTY(IES)
	LOCATION	COMMUNITY		COST	SOURCE		NEW	REHAB.	EXISTING	
I	Cisaranten and Cinambo River	RW 09, 06, 05, 07, 04	Reduce floods, improve economy	?	APBN/APBD; BLN	2001	V			Local Government
II	RW 09	RT 01 & 02	Save the economy	25.000.000	-	2001	V		V	
III	RT 01 & 02 of RW 09	RT 01 & 02	Provide clean and healthy water; prevent diseases	20.000.000	-	2001	V			
IV	RT 01 of RW 09	RT 01 & 02	Provide clean and healthy water; prevent diseases	5.000.000	-	2001	V			
V	RW 09	RW 09	Ease treatment and reduce its cost	-	-	2001	V			
VI	RW 09	RW 09	Increase income	50.000.000	-	2001		V	V	
VII	Kelurahan Cisaranten Kidul		Mitigate flood; improve economy	-	-	2001	V			
VIII	RT 01 & 02 of RW 09	RT 01 & 02	Improve health	10.000.000	-	2001	V			
IX	RW 09	RW 09	Improve economical occupations	15.000.000	-	2001		V	V	