



do your own MANGROVE

ACTION

PROJECT



an action-research problem-solving method



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written by ben brown

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Russell E. Train
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"a raindrop cleans the wetlands"	

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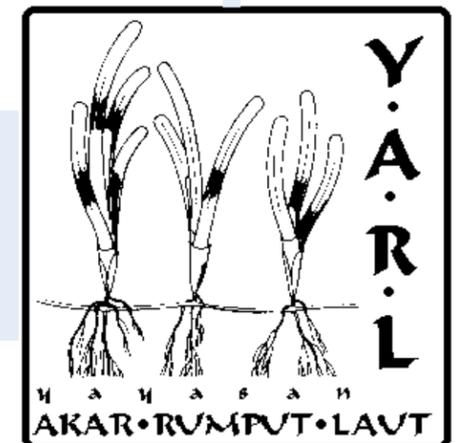
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acknowledgments

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

This methodology has been primarily adapted from methods developed by the founders of the Global Rivers Environmental Education Network (GREEN), William B. Stapp and Mark K. Mitchell. This methodology also contains original material developed by Ben Brown during his time with GREEN, Yayasan Kelola-Manado, FAO-Community IPM/Thai Education, and Mangrove Action Project (MAP). In essence it is a methodology to be used in facilitating a school-group or group of coastal community members in the investigation and active resolution of local environmental issues. This particular methodology was created for use in tropical coastal zones; primarily mangrove forests, hence the title "Do Your Own Mangrove Action Project."

In memory of the late William B. Stapp, I am proud to be one of many "Stapp-ites" around the globe furthering the vision of what Bill called "peace education." Tears form in my eyes every time I remember him and I wish peace upon him and condolences to his family and friends on his passing.

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-Benyamin Brown, April 2004.

foreword

The chapters of the "Marvelous Mangrove Curriculum" provide activities and information about mangroves, their relationships to other tropical coastal ecosystems, detailed approaches to observing mangrove areas from social, geographical, cultural, economic and political viewpoints, and guidance in taking scientific measurements about the health of the mangrove. But where do all of these observations and measurements lead?

The "Marvelous Mangroves Curriculum" does provide several action-taking activities to help observers become do-ers. The purpose of this manual is to provide a detailed methodology to enable people to move from making observations/investigations and measurements to defining observed problems (environmental, social, economic, etc.) and taking action to resolve one specific issue.

"Do Your Own Mangrove Action Project," is intended for use both by students currently engaged in tropical coastal studies, fisherfolk organizations and more specifically participants of Mangrove Action Project's "In the Hands of the Fishers" workshops.

This manual begins by providing some background and a description of action-taking. Next, a series of activities for moving through the action-taking process are explored. Finally some case studies of mangrove action projects are presented.

The three primary steps in an action-taking process are:

1. To move from observations and measurements to interpretation of the data and definition of the problem.
2. To explore solutions to the problem using a visioning process, without initially becoming concerned about potential barriers.
3. To take action and assess whether the desired outcome is being reached



background

Environmental problems are by nature interdisciplinary, embracing science, social science, economics and politics. Effective solutions to these problems rest upon a respect for the culture in which they are found. Although we need to be understanding of cultural values, we may at the same time be critical of human practices that damage the environment and disregard basic human rights.

Because environmental problems are interdisciplinary in scope, and often affect diverse populations with differing values and perspectives, effective solutions require looking at problems from various points of view. The complexity of environmental problems, and appropriate responses to these problems, require a sense of competence that stems in part from a thorough knowledge of the problem area.

“Do Your Own Mangrove Action Project,” combines aspects of field-work focusing on the health and use of mangrove ecosystems, with a community problem solving approach that follows the three steps noted above. The model is based on research into how people organize ideas (cognitive-mapping), how people solve problems, and how educators can use this information to make education more relevant and meaningful. Ultimate success is measured by the change in values of the target group, improved health of the mangrove ecosystem and a coincident improvement in the quality of coastal peoples’ lives.



The process followed in taking effective action has been influenced by environmental educators seeking effective means to educate and empower people about their environment, and by educational researchers interested in problem solving strategies within educational contexts.

The educator John Dewey was an early advocate of reflective thinking, and believed that thoughts cannot be separated from action (Dewey, 1963). He thought that schools should involve students in the real world to make education more meaningful. Paulo Friere, a Brazilian Educator, worked to empower illiterate people in Brazil. His philosophy is represented in the following statement (Friere, 1970):

You never really understand an issue or know how to help resolve it until you involve yourself in the issue. Then you begin to understand it, to identify the principal parties and actors involved, and begin to realize how to change it.

Community problem solving consist of the following elements: recognizing a problem; setting problem objectives; working in groups; collecting, organizing, and analyzing information; defining the problem from different perspectives; identifying and selecting alternative actions; carrying out those actions; and evaluating outcomes and the process (Brody, 1982).

The use of action research and community problem solving in the area of environmental education has come most notably from the work of William Stapp, Arjen Wals, Giovanna Di Chiro, Ian Robottom, Bill Hammond, and Harold Hungerford. This is the educational philosophy MAP uses to engage coastal communities in problem solving.



kolb's learning cycle

Educator David Kolb proposed the "learning cycle," a concept of the learning process that is well known among practitioners of adult non-formal education. For Kolb the learning process can be boiled down to four elements or stages, which constitute a learning cycle.



In Mangrove Action Project's Curriculum "Marvelous Mangroves," much emphasis was placed on the first three steps of Kolb's learning cycle: concrete experience, observation and reflection and generalization and abstract conceptualization. In this compendium to MAP's curriculum we expound upon the fourth phase "active experimentation." This manual provides tools for educators to follow-up on lessons from earlier activities by taking local action in their community to resolve an environmental issue of their choosing. The section in this manual on action-taking activities provides solid guidelines for community action taking.

nine (9) action-taking activities

The activities in this section are designed to awaken students'/ participants' concern for the environment; develop tools to gather more information, build problem solving skills vital to the future; and instill a greater sense of confidence in their abilities. They are structured to help lead participants through the process of problem solving and action-taking. The activities begin with a field trip to the coastal area of concern, be it a fishing port, abandoned shrimp pond, seagrass lagoon, etc. After observation of this area, students will be asked to draw a series of three murals (large pictures) depicting the present, past and future of this area. This will help them to visualize both environmental problems encountered in the field as well as solutions. Finally a series of activities lead the student through problem identification to resolution. The activities include:

- Activity 1: Field Trip/Observation
- Activity 2: Assessment (Mural Drawing of Present Day & Community Interviews)
- Activity 3: Identifying Specific Problems (Mural of Past)
- Activity 4: Visualization (Mural of Future)
- Activity 5: Selecting an Issue to Address
- Activity 6: Contacting Organizations and Decision Makers
- Activity 7: Developing an Action Plan
- Activity 8: Taking Action
- Activity 9: Follow-up

We recommend that you use all nine of these activities, in the order given, with your students/participants who plan to take action.



Activity 1

field exploration

Objectives:

- ❖ Engage students/participants in a visual survey of a mangrove or other coastal area involving recording of information that will lead to the creation of maps/murals.
- ❖ Develop a spark of appreciation for the mangrove/coastal area.
- ❖ Uncover negative impacts to the mangroves/coastal zone or potential sources of pollution that should be studied further.
- ❖ Develop team building skills
- ❖ Develop use of all five senses (sight, hearing, smell, touch, taste).

Materials:

- Open eyes and ears.
- Sandals, old sneakers or boots for walking in mud
- Willingness to get wet and dirty
- Hat, sunscreen
- Drinking water
- Pencil, paper and clipboard
- Pair of binoculars for bird study (optional)
- Lunch if needed
- Trash bags

Time: 2-3 hours at low tide.

Background Information:

Following are brief instructions for leading a field exploration in the mangroves or other coastal area. For truly excellent detailed lessons, see "Exploring Mangroves," section 4 of the Mangrove Action Project Curriculum: "Marvelous Mangroves."

This field exploration should not be too structured. The important thing is to get student's/participants into the mangroves/coastal zone and begin to assess its health using their senses. This is called *qualitative analysis*. Without using field equipment or taking measurements, how healthy does the environment feel? Later on, when specific areas of study are identified, more detailed field analysis may be needed using field equipment and scientific methods. When we measure the health of the environment we call that *quantitative analysis*.

Procedures:

1. Site Selection

This activity can be carried out in any coastal area, mangrove forest, tidal wetlands, beach, fishing port, seagrass bed or if you are lucky several ecosystems will be located near to one another. If your country has nature reserves or parks, that may be a good place to visit, but the closer to home or school the better. By choosing a site close to home, the probability of becoming involved in action taking increases.

Some things to consider when choosing a location are

- **Access:** do you have permission to access this area
- **Safety:** be careful of waves, deep water, sharp rocks, boats etc.
- **Tides:** it is often best to visit the coast at low tide, so you have access to the rocky inter-tidal and can investigate local animal life
- **Local Guide:** when visiting a new area, especially with school groups it is important to visit with an experienced guide, naturalist or local villager familiar with the area. It is best to have at least one adult per 10 students for supervision.

2. Etiquette

When visiting any natural area, it is important to remember that you will be visiting the home of many creatures, both plant and animal. Therefore it is important to leave things as you find them. How would you like it if an animal came to your home and rearranged your furniture, or took your roof for a souvenir? It is said when visiting nature to "Leave only footprints and take away only memories." If you must take something home from the beach, bring a large plastic bag and collect some garbage. Many animals, especially invertebrates hide amongst rocks, logs and tree roots. It is OK to search for these animals. It is even OK to hold some of the animals (never an octopus, or sea snake), but please make sure to wet your hands, handle with care and always gently put the critter back where you found it. If you lift a rock to find animals in the inter-tidal, put the rock back down carefully.



Activity 1
field exploration



Activity 1

field exploration

3. Sensory Exploration

This is a quick exercise to determine how “natural” your field site is. Ask all the participants to close their eyes and be absolutely quiet for one minute. While their eyes are closed, ask them to count all the natural sounds they hear on their right hand, and all the human made sounds they hear on their left hands. Natural sounds may include the waves, wind on leaves, birds, insects... Human made sounds could include motor bikes, someone whispering, talking or even shouting, an airplane overhead, a chainsaw! After one minute, the participants will open their eyes and share what they heard with the group. Is your field site dominated by right hand or left hand sounds. Where could you go to find a more natural area (right hand sounds). Where might you find more human made noises? What are your thoughts about this activity?

4. Recording feelings, thoughts and information:

Feelings: Does the coastal area feel healthy. Are people using the coastal area for recreation (swimming, diving, boating), for livelihood activities (fishing, spear-fishing, gathering wood, boating)? Are there industrial scale activities such as logging, mining or aquaculture. What other kinds of human activities are taking place at the coast, perhaps washing clothes, garbage disposal, or going to the bathroom. List everything you see.

Thoughts: Looking at the list you have created, start to make judgments about which activities are good for the local community and good for the coastal environment.

Next to activities that you consider positive write a (+) sign.

Next to activities that you consider negative write a (-) sign.

Next to activities that you think should change write a triangle (Δ) sign. This is the Greek letter delta and means “change.”

Information: Now it is time to start recording specific activities and resources along the coast.

First start with the name of plants and animals you see. Use local names whenever possible, but later on try and find out common names or even Latin names. This will help you communicate with the global community when looking for solutions to problems.

Draw a circle around plants and animals that are used by the local community, perhaps as food, medicine, for building materials or other uses.

Also begin to collect information about places and habitats, including the name of the habitat, size, has it been decreasing or increasing over the years, is there a land-owner? Is it open access to the whole community. Are there any disputes over regions in the coastal zone? Think of yourself as a reporter, trying to collect information to write an interesting story. Indeed, you will not be able to act to make a positive change in this coastal area, until you understand it's story.

Discussion Questions:

- ? What do you think about the overall quality of your mangrove or coastal area? How do you feel about its current state?
- ? Based upon your observation, or things you already knew, what are some potential problems facing your mangrove/coastal zone today?
- ? Did you discover any potential sources of pollution?
- ? Is there any evidence of human activities which have altered the health of the mangrove/coastal ecosystem?
- ? Do many people make their living from the mangroves/coastal area? How are they making a living? Are their livelihoods threatened?



Activity 2

assessment: mural drawing of present day

Objectives:

- ❖ Qualify the condition of the coastal zone
- ❖ Promote artistic impression
- ❖ Build skills working in groups

Materials: Markers/oil pastels, large butcher paper, notes from field observations, paper and pencil for community interviews

Time: 90 minutes during day one; overnight interview; 60 minutes during day two; 90 minutes during day three

Background Information: Once you have made a field observation or field trip, you may be concerned about specific problems you have discovered. This activity gives you a chance to synthesize the information you have gathered and begin to ask, "What are the most serious threats to the mangrove/coastal zone? What are their root causes?"



The next few activities involve the group in drawing three (3) murals and conducting interviews of community elders. The three murals can be drawn in any locale (mangrove forest, fishing village, wet rice field, etc.) but must depict the past (40 years or two generations ago), the present and finally and idealized vision of the future of that locale. These murals can be drawn in small groups (5-6 students/participants) or one large group (20 students/participants).



Activity 2

assessment: mural drawing of present day & community interviews

Procedures:

1. Before beginning the first mural, the group should take a visit to the mangrove field site as outlined in activity number one, "Field Exploration."

2. The first mural is to be a present-day depiction of the site. This is also known as a "sketch map." All that is required is a large blank piece of paper, marking pens or oil pastels, and a comfortable place to draw. Look at the coastal fishery harbor on page 9 as an example of a sketch map.

People drawing maps often find it easiest to draw first those features of the coastal area that are most familiar to them, for example the way from their home to the beach or their fishing grounds. Distinct geographical features such as bays, river mouths and islands are also good starting points. When asked to draw these features, the group will usually draw the coastline first, and then add in the mangroves, rivers, seagrass beds, roads and settlements. To avoid confusion, use local names when referring to resources, places and habitats. Coast-lines are best drawn in black ink using other colors (blue, green, brown) for other features.

Sketch maps provide information and insights about what resources are important to local communities participating in the group. This sketch map or mural of the present day, will be compared with murals of the past and future to help in planning local actions.

Have the group take their time in drawing as the finished product will have to be referred to throughout the week. The finished murals also make good wall hangings for a coastal community resource center to demonstrate the process of action research problem solving to visitors.

3. After completing the first mural, the facilitator can interpret what they see for the whole group and perhaps the students will want to add something important.

4. Next set the mural aside and ask the group to start thinking about the site two generations ago. How might things have changed over time, what exists in the present day mural that probably was not there in the past? What things were present in the past that are now gone, or even extinct? Most people do not appreciate the rapid and large-scale changes that environments undergo during the course of a single human life. Drawing a mural depicting the coastal zone two generations ago, will provide the participants with a sense of place and a sense of history that is often lacking in modern society.

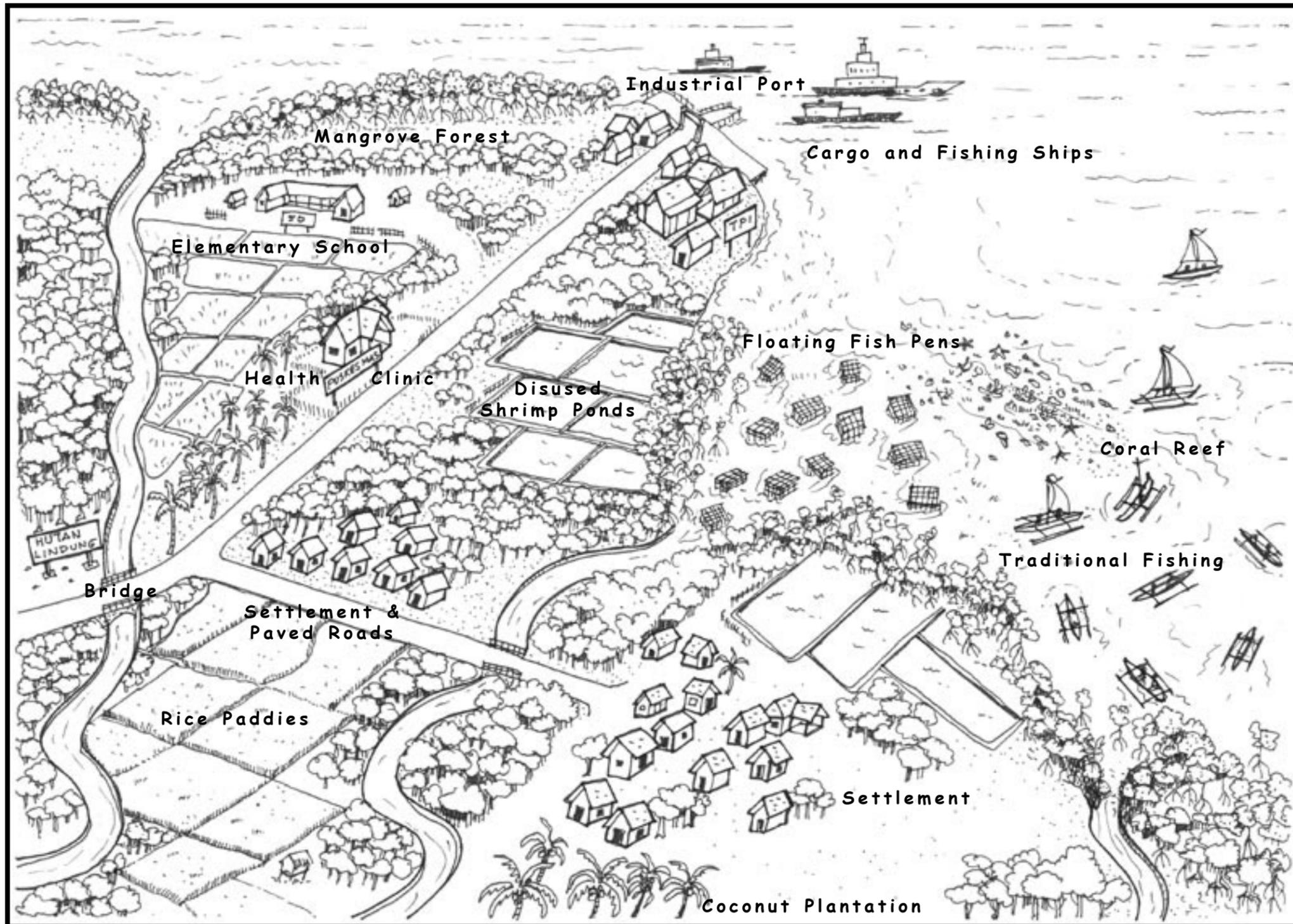
5. In order to draw the picture of the past, the group will probably need some help. Who can help them? Try and pose the question so that the participants themselves realize that they will have to seek out local information. The sources may vary from old newspapers, to photos or maps, but the best sources of information are community elders.

6. In order to extract information from the community elders, the group will have to create interview questions. What questions should the group ask that will be effective at painting an accurate and inclusive picture of the past? Have the group create at least ten simple questions that can help them paint a picture of the past. Questions like "was the beach pretty in the past" may not be specific enough to help the students draw. Examples of specific questions include: "In the past did boats harbor in the river? What kind of boats? What kind of fishing gear did the boats use....?"

7. Using the interview questions as a guide, go out into the community and interview community elders. You can interview your grandparents, or an elderly uncle or aunt, or elders from a neighbors family. Once you begin interviewing community elders you will probably think of new questions to ask, and the elders will likely provide details that the group did not anticipate with their questions. Keep detailed notes of your conversation.

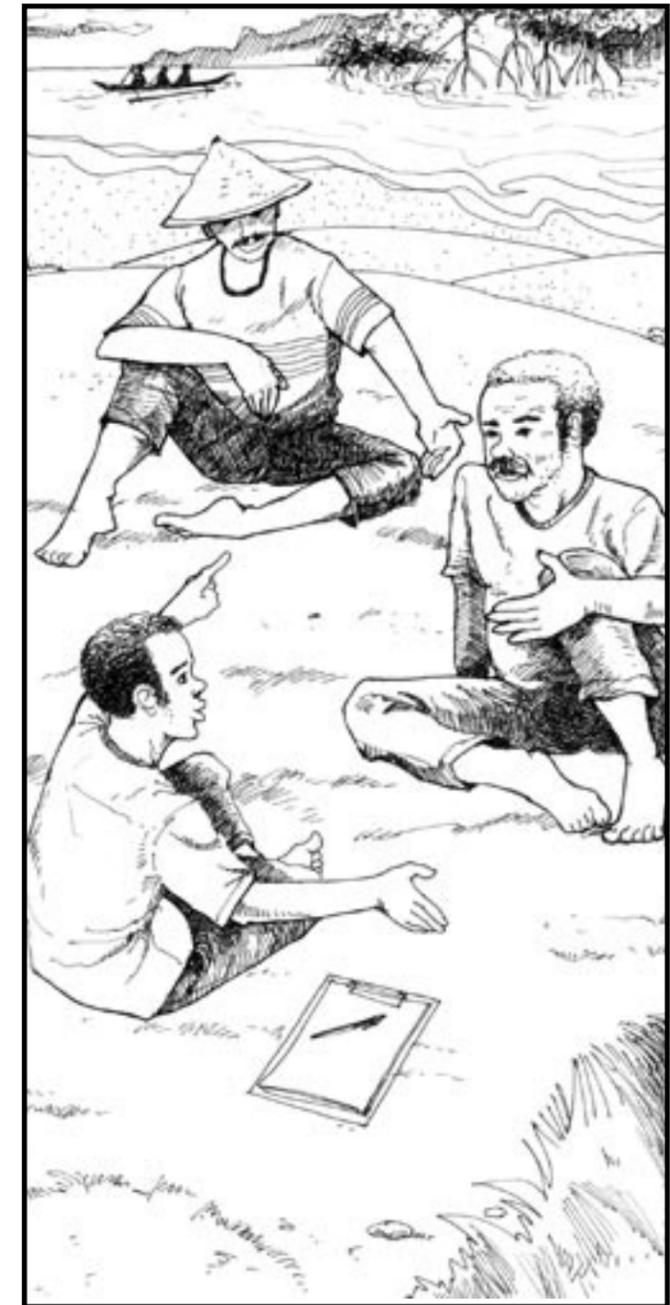


PRESENT MURAL



Activity 2

assessment: community interviews



HOMEWORK ■ COMMUNITY INTERVIEW

7. Using your 10 interview questions as a guide, go out into the community and interview community elders. You can interview your grandparents, or an elderly uncle or aunt, or elders from a neighbors family. Once the you begin interviewing community elders you will probably think of new questions to ask, and the elders will likely provide details that you did not anticipate. Keep detailed notes of your conversation.



Activity 3

identifying specific problems: mural drawing of past

Objectives:

- ❖ Identify root causes of coastal habitat degradation
- ❖ Promote artistic impression
- ❖ Synthesize students' impressions and ideas

Materials: Markers/crayons, large butcher paper, notes from community interviews

Time: 90 minutes

Background Information: Once you have completed the community interviews, you may be concerned about certain changes that have taken place since the time when your grandparents were kids. Drawing the mural of the past and comparing it to the mural of the present gives you the opportunity to begin to explore how change has taken place. What are the most serious threats to a healthy mangrove forest and a healthy and resource rich community? What are their root causes?

1. Upon completion of the interview, the group should reconvene, share thoughts and start the second mural; this one depicting the same coastal location but 40 years in the past. It is likely that the past mural will depict less roads, less settlements, more and larger mangroves, fish, different types of boats and fishing equipment. Schools, community health centers, central markets, electricity and running water may have been absent from the past. Ask the students to create the mural of the past without attaching value judgments like "the past was better" or "how boring the past must have been."

2. After drawing the past mural the group may realize that they left some things out of the present day picture, it is fine to give them some time to revise their present day drawing.

3. At this point it is nice to compare the past mural with the present. The facilitator can take the group through the process of pointing out changes that have occurred over the past 40 years. One way to do this is to have the group put a red circle around things that they think have changed for the worse and a blue circle around things that have changed for the better. You may also circle in blue, things in the past mural which the group determined good but have changed for the worse.

For examples see page 13, "Comparing Past and Present Murals."

4. After circling changes in blue and red, the facilitator should focus the groups attention on the red circles in order to identify specific problems. The red circles represent changes for the worse, or negative changes. Behind these changes lie problems and their root causes. Distinguishing between the negative change and the root cause or problem is the intent of this activity.

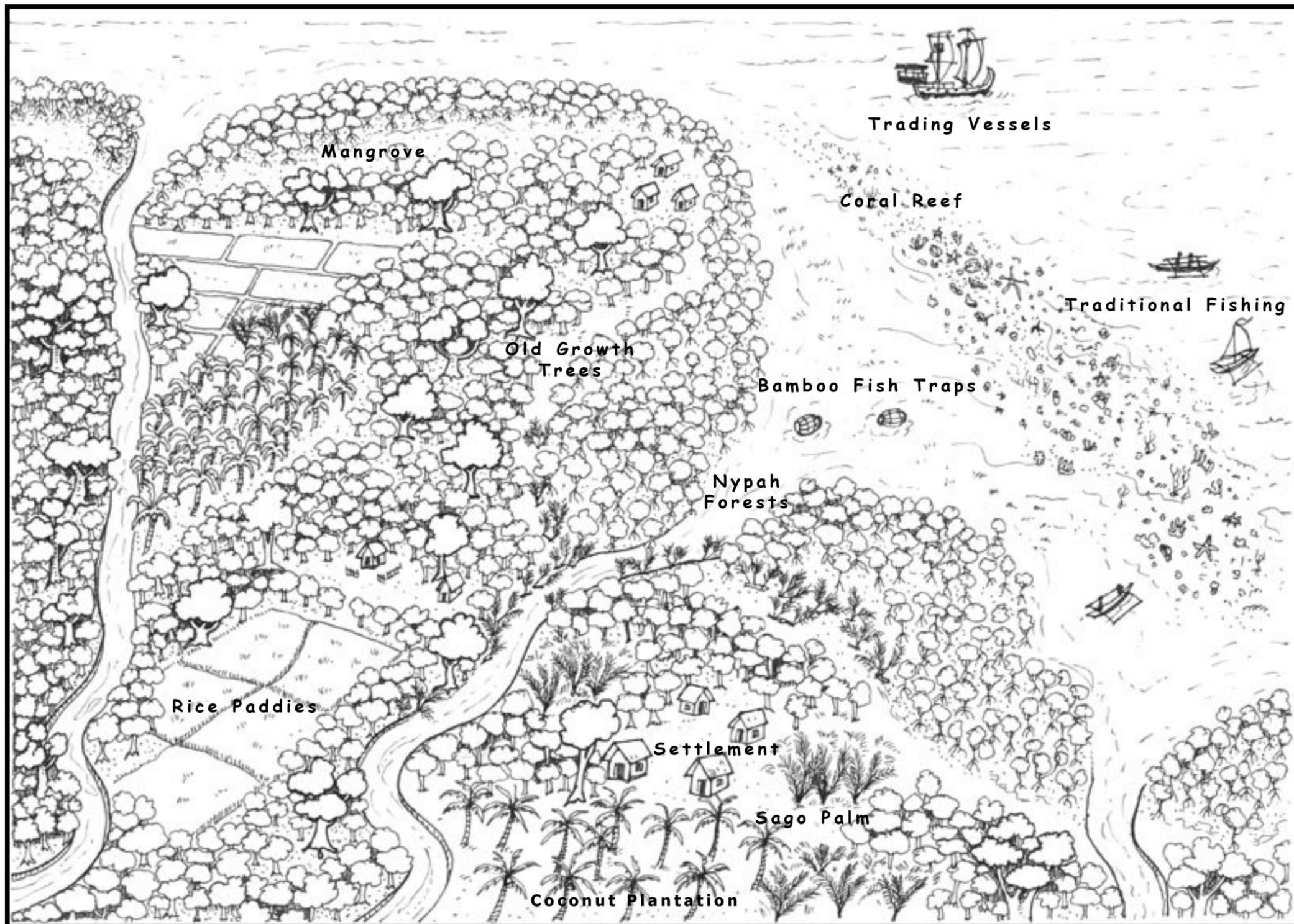
a. Distinguish between the more obvious, immediate cause of a problem, and the various levels of underlying root causes (which are usually not so obvious)

For example, you may have identified a problem like the inability of mangroves to grow along the coast where mangroves used to live 40 years ago. From your field work you may have discovered that in an old shrimp pond mangroves can not grow even when new propagules are planted. From your community interviews you know that mangroves used to grow in that area. What are the underlying problems? Perhaps the soil is polluted from its days as a shrimp pond bottom. Upon further investigation you may find that mud in old shrimp ponds that gets exposed to the sun becomes acidic. Perhaps the tides do not get enough chance to soak the young seedlings. Perhaps small crabs or insects are attacking the young plants. These may all be considered root causes of why mangroves cannot grow in that area again.

b. If possible identify other root causes for each problem, but this time delve deeper. Continuing with one of the examples given above, the fact that the soil is too acidic is not the root problem. The soil became too acidic because the shrimp ponds were allowed to be exposed to the sun too long after being abandoned. A deeper root cause of this problem is that the government agency that allowed the shrimp pond development did not follow-up on rehabilitating the area after the shrimp pond went out of use. Perhaps they did not know there was a problem with disused shrimp ponds. Or perhaps they had no budget to deal with the problem. Determining root causes gives us the chance to sharpen our critical thinking skills.



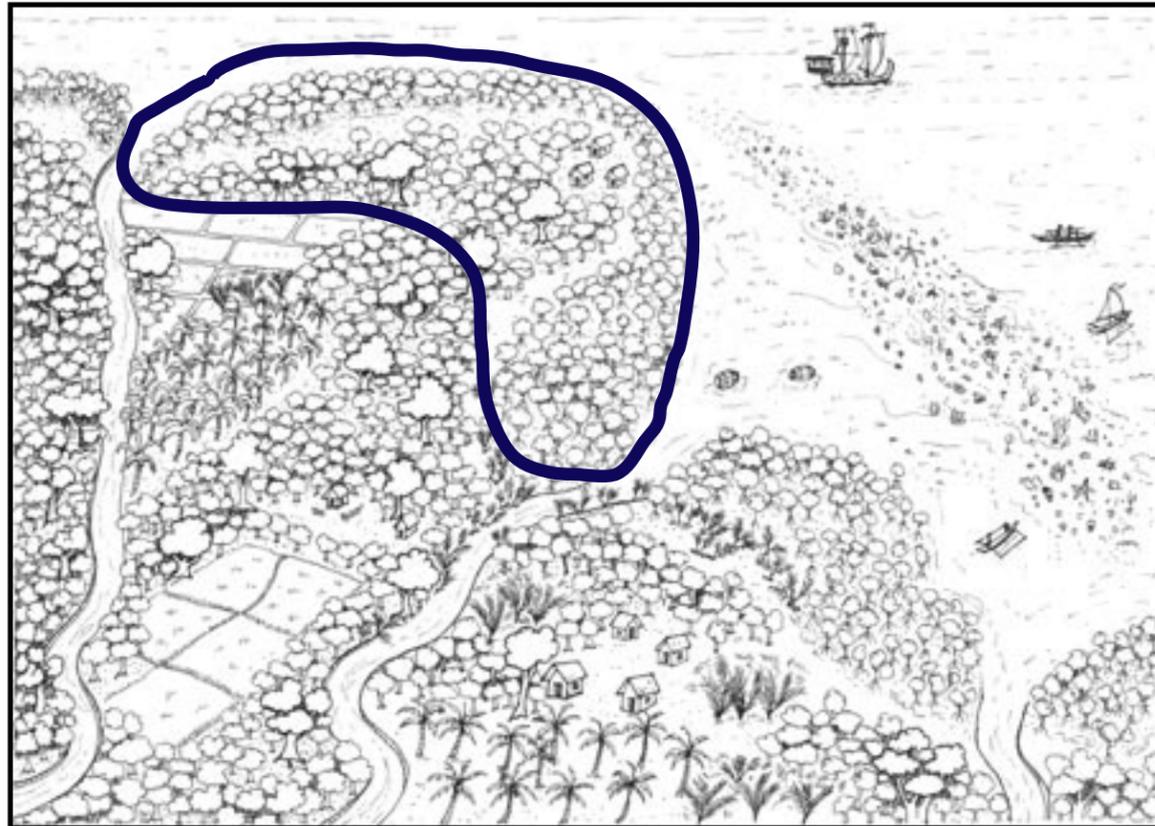
PAST MURAL



Activity 3

identifying specific problems: comparing past & present murals

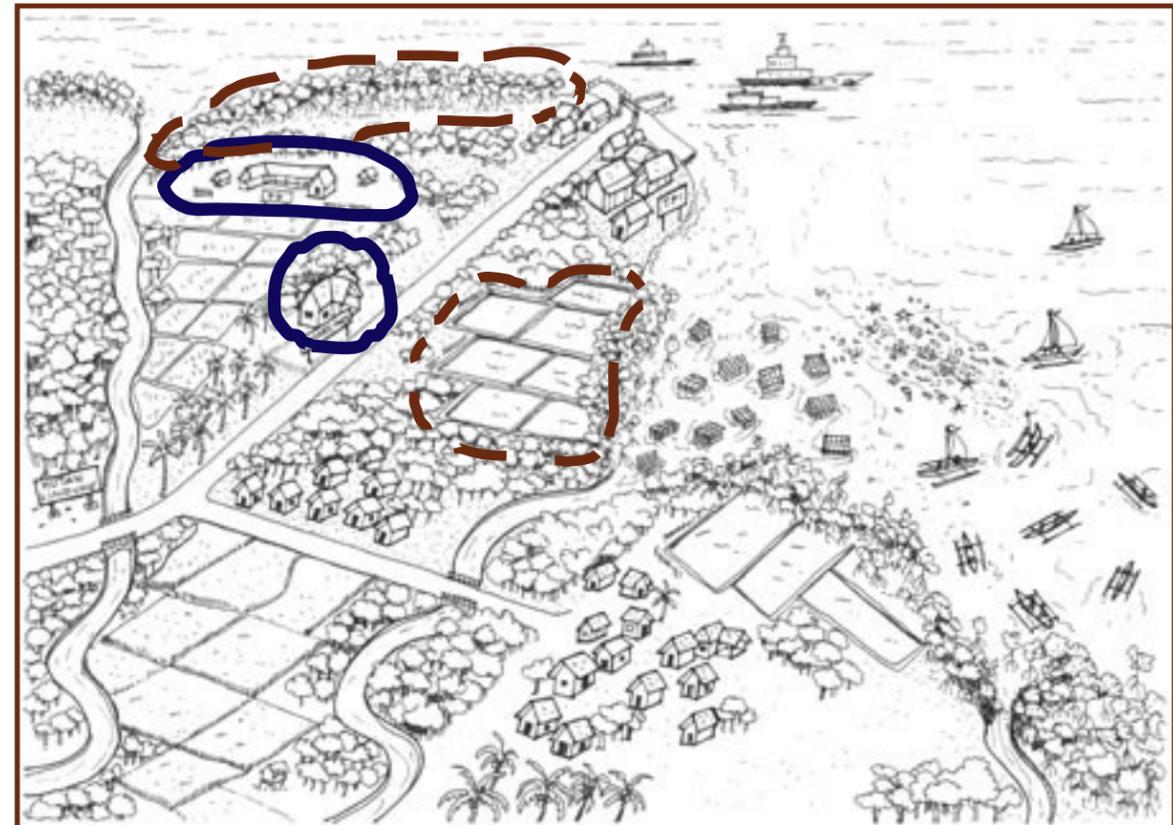
PAST MURAL



Ex. The past mural may have depicted a more biodiverse and healthy mangrove forest which the students may say is better than the present forest. The past forest would thus be circled with a blue marker, while the present forest may be circled with a red marker (here indicated by a dotted ref line). Aside from circling the degraded mangrove habitat in red, the group also circled the disused shrimp ponds which were converted from mangroves.

Ex2. The past mural may have lacked a community health center. This may be circled in blue on the future mural if the students agree that a health center is a positive addition to the community. The group also circled the addition of a school.

PRESENT MURAL



REMINDER: After circling changes in blue and red, the facilitator should focus the groups attention on the red circles in order to Identify Specific Problems. The red circles represent changes for the worse, or negative changes. Behind these changes lie problems or root causes.



Activity 3

identifying specific problems:
comparing past & present murals

c. If you have trouble identifying root causes, try to fill in the blanks on the following sentence for each problem identified:

(*Problem*) is the result of (*immediate/direct cause*) which is caused by (*root cause*).

A possible answer would be: The inability of mangroves to grow in a disused shrimp pond (*problem*) is the result of acid sulfate soils (*immediate/direct cause*) in the substrate of the shrimp pond which is caused by the lack of attention paid to rehabilitate shrimp ponds after abandonment due to budget constraints and lack of knowledge (*root cause*).

d. Come up with a root cause of as many of the problems circled in red on the mural as you can. Even if you do not have enough information to be certain if your root cause is correct. Later you will have the opportunity to research the problem in greater detail. (activity "Contacting Organizations and Decision Makers") The purpose of this activity is to think critically, and to learn to appreciate and understand the complexity of environmental problems, so that when you move onto action-taking, you can tackle the sources of a problem, rather than simply treating the symptoms.

Discussion Questions Day Two:

? In general how has the coast changed from the past to the present? Is change a good thing or a bad thing, or do you have another thought about change?

? What does it mean when people talk about the "quality of life?" Has the quality of life changed for the better or worse over the last 40 years or has it stayed the same?

? What does it mean when people talk about "wealth?" Does wealth always mean a lot of money? How has the community's wealth changed over the last 40 years?

? Are you able to distinguish between change and a problem? Between a problem and the root causes of the problem?

Activity 4

visualization:
mural drawing of the future

Objectives:

- ❖ Visualize future state of mangrove or coastal area
- ❖ Promote written and artistic impression
- ❖ Apply previous experiences to a new activity

Materials: Notebook paper, Butcher paper, Crayons/Markers

Time: 90 minutes

Background Information: The final mural will lead us into problem identification and eventually action-taking. By this time the group will have many ideas and should be ready to paint a mural of the future. But before they start it is important to make one thing clear; when creating a new future, you can not simply erase the mistakes of the past and present, in other words you can not simply turn back the clock. The future mural must build on the present, to create a more ideal future. For instance, if there once was a healthy biodiverse mangrove forest where there is presently a boat harbor, you can not simply draw in a biodiverse mangrove forest, but perhaps draw a mangrove seedling nursery and a harbor where boats and mangrove co-exist. Although we can not simply go back to the past, it does not mean we can not dream about an idealistic future. Draw the future mural without thinking about barriers or restrictions that may prevent you from creating your dream world. This is just a picture. When it comes time to choose one issue to focus on, you will encounter real world obstacles, but without a clear picture of what you want to achieve, how will you know in what direction you should go?



Activity 4 visualization: mural drawing of the future

Procedures:

1. Visualize how you would like the mangrove/coastal area to look in the future and record your thoughts in written form before putting them on the mural. Some suggestions that may be helpful are:

a. Clear your mind for writing. A moment of silence can help you focus on this activity

b. Reflect upon your personal experiences and knowledge of the mangrove, seagrass beds, coral reefs and tide pools. Think of both positives and negatives.

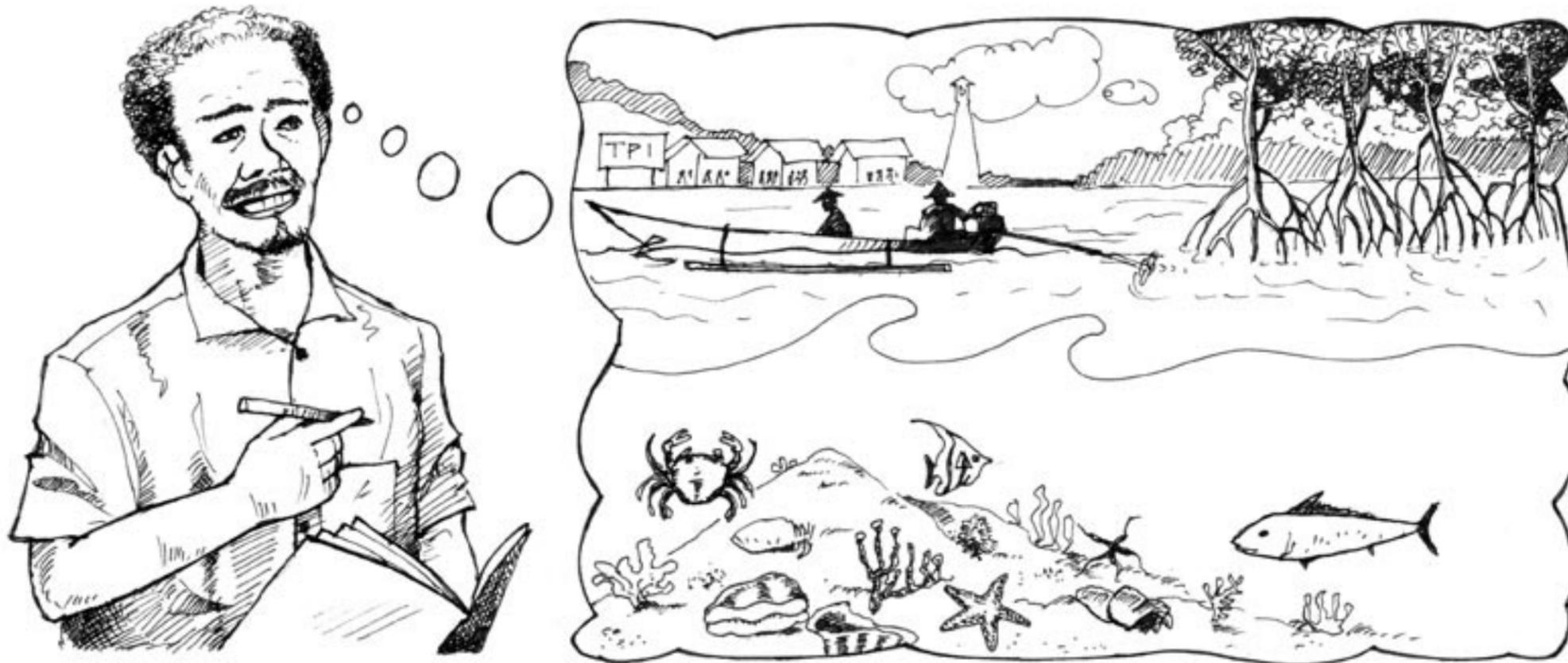
c. Try to be specific in writing down your thoughts. "I want the mangrove to be healthy" does not convey much information. Why do you want a healthy mangrove? So that people can catch fish and crabs in the mangrove? So that people can enjoy the mangrove as a park? To protect a village from wind and waves?

d. Discuss changes or improvements that you would like to see. Words like "reduce," "eliminate," "improve," and "increase" demonstrate intended action or changes.

e. Consider young people in the next generation, 20-30 years from now. What kind of mangrove or coastal area would you like them to experience?

f. It is easy to get caught up thinking in terms of economics. Although economic needs are often the highest priority of a coastal community, this type of thinking leads to short-term economic gain while ignoring long-term sustainable use of resources.

g. You may want to assume the role of a young fish or other creature from the mangrove. What kind of environment would the fish like? What are some changes that would have to occur?



Activity 4 visualization: mural drawing of the future

2. Before the group begins to translate their words into pictures, some people may want to share their personal visions with the entire group. Student writings and art will convey goals and aspirations for the mangrove that are shared by the community. Some ideas for achieving these goals will emerge within the writings and can serve as the groundwork for gathering further information on issues affecting the health of mangroves, and designing an action plan.

3. Ask students to work on the mural of the future. Encourage them to feel free to create a picture of an ideal coastal area, both a nice home for coastal creatures and a place where humans can go to make a living or simply enjoy time with nature.

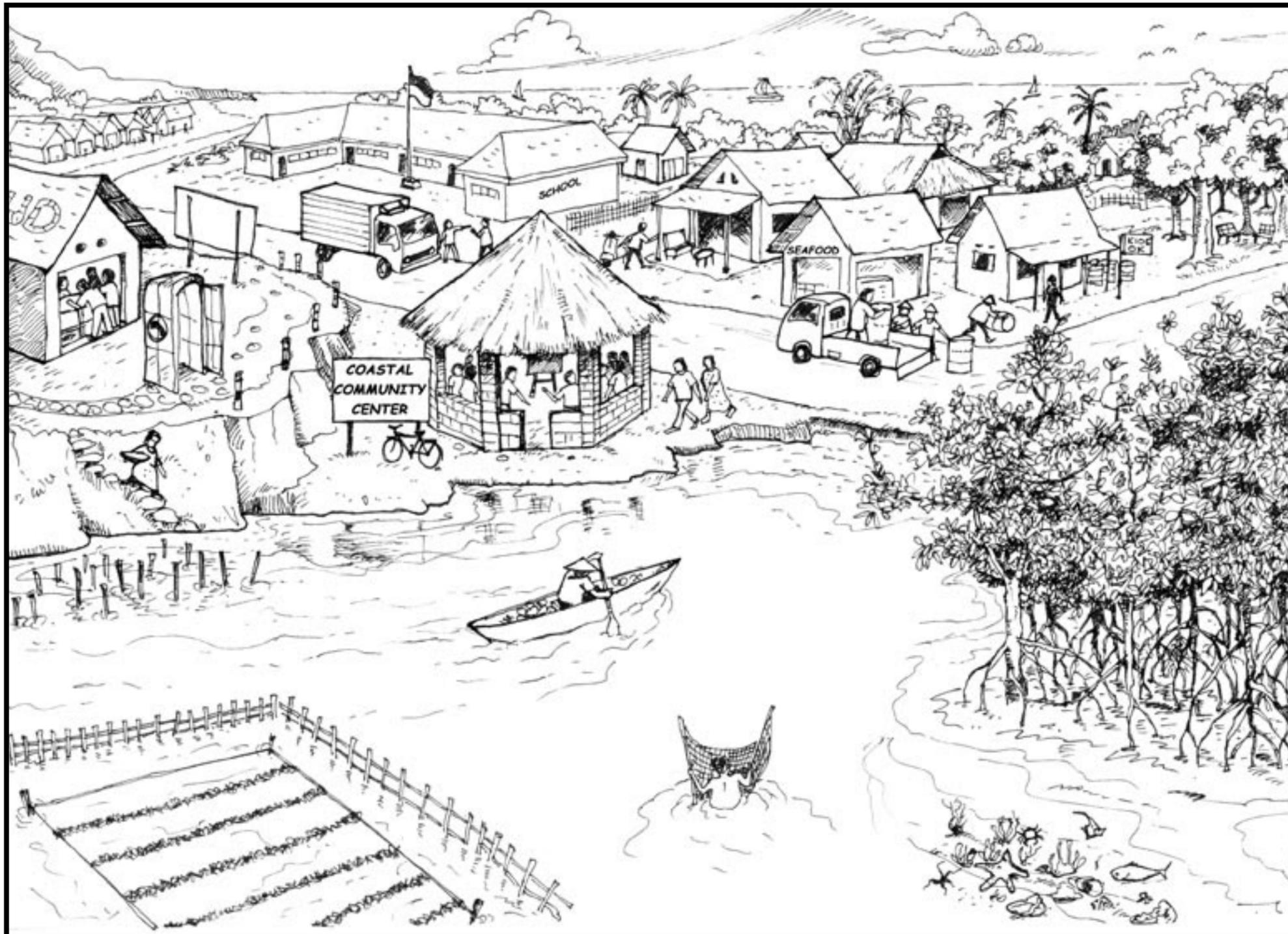
At this point much relies upon the facilitator to help the group analyze the three murals, and focus on one aspect that they share in common. What we see building here is a process by which the participants of the training and not the trainers, are focusing themselves on an environmental issue, drawn in terms of their own observations, investigations and visions. From here the next step is simply to have the group choose one issue, identified in the three murals, which they hope to resolve. In the previous example they noted that they would like more mangroves inter-mixed in the harbor. Is this possible? What kind of species can grow there. What kind of functions do they hope the mangrove provide? Habitat for fish? A source of firewood? Protection from waves and erosion of shoreline? What species of trees match these functions? Are they locally available? How to propagate them? Who should be involved in the project? Government? Local fishers? School children?

Discussion Questions:

- ? What new thoughts were generated as a result of your visualization activity?
- ? Do you feel what you visualized can become a reality?
- ? Do you think you will need the help of others to make your visualizations a reality? Who can you ask for help?



FUTURE MURAL



The future mural pictured at left depicts the community ideal. Traditional fishing in the waters, seaweed mariculture, healthy mangroves, farmland, a road, access to the market, traditional and modern houses, a few (but not too many) motor vehicles...

In this picture, the mangroves near the village, the road, the seaweed farming and some modern houses are all additions.

Some things that were taken away from the present mural include a shrimp farm, a person using the lagoon as a bathroom, and a person cutting mangroves for charcoal.



Activity 5 selecting an issue to address

Objectives:

- ❖ Developing problem-solving skills: prioritizing problems and generating criteria for selecting one issue to address.
- ❖ Building group process skills: making choices by discussion and consensus.
- ❖ Enhancing analytical skills: clearly defining and stating the problem chosen

Materials: Mural of past and present generated in Activities 2 & 3, list of problems and root causes from Activity 4, blackboard and or large sheets of paper.

Time: 80 minutes

Background Information: In Activity Four, students generated a list of problems that affect the mangroves and coastal communities and identified one or more root causes for each. If you wish to take action to solve any of these problems, you will need to spend some time selecting criteria to narrow the choices and then choose one issue to address.

Procedures:

1. Generate criteria for selecting a problem to act upon. Some useful criteria are:

-Is the problem relevant to the community and of high interest to students in the class?

-Is there adequate information about the problem?

-Are other people or organizations already working on the problem? (This can be very useful, since other organizations may have information and access to resources which students can tap). It is also important to coordinate with other organizations working on the same issue and not to simply duplicate efforts.

-Is the problem too large or too complex for student action? If so, can it be redefined, or simplified in such a way that students can take meaningful action(s) to address the problem?

-What kinds of resources will you need to tackle this problem? Are these resources available? (Resources include money, time, skills, equipment.)

-What is the group's time frame for working on this project?

-What kind of action will most likely be appropriate for solving this problem? Is this level of action feasible for students?

2. Evaluate the list of problems in light of these criteria.



Activity 5 selecting an issue to address

3. Next, agree on a problem to address. Try and agree in a participatory manner with the whole group in some sort of consensus. Make the group aware that it is important to take action together, and that although perhaps their own issue was not chosen by the group, there will be a chance for working on other issues after learning how to resolve the first one.

4. Students/participants should then work together to develop a precise statement of the problem they have selected.

Example: The inability of mangroves to grow in a disused shrimp pond (*problem*) is the result of acid-sulfate soils in the substrate of the shrimp pond which are caused by the lack of attention paid to rehabilitate shrimp ponds after abandonment due to budget constraints and lack of knowledge (*root cause*).

5. Define what you see as a successful outcome of your actions. *Example:* The group has worked with local community to rehabilitate the soil so that it is able to support mangrove growth. Results have been presented to the community, government, and academics so in the future all local stakeholders understand the importance of rehabilitating disused shrimp ponds in a timely and appropriate manner, and are more critical about the development of new shrimp ponds.

6. Finally evaluate and critique this problem statement as a whole class.

Discussion Questions:

- ? Was it difficult to reach consensus on the issue to be studied?
Why?
- ? What influenced your decision to select the issue to be studied?
- ? Do you think your class can help resolve your selected issue?
Why?

Activity 6 contacting organizations & decision makers

Objectives:

- ❖ Identify community resources
- ❖ Gather information related to the problem selected.
- ❖ Develop phone and personal interviewing skills
- ❖ Learn how to write effective letters

Materials: Newspapers, telephone directories, government directories, reference books, internet (if possible), stamps, paper, envelopes, typewriter, money for telephone calls.

Time: 40-80 minutes

Background Information: This activity is designed to help develop basic research skills which are essential to effective problem-solving. It is important to learn to gather information from diverse sources and to critically evaluate this information to resolve environmental problems.

This activity can be used to help research the problem you selected in Activity 4. The research you conduct will provide you with a better understanding of the problem, and prepare you to develop an action plan (Activity 7).

Procedures:

1. You have raised many difficult questions throughout the course of the previous activities. Now you have the chance to search out some answers. In small groups or individually, generate a list of questions you have about the problem your class chose to resolve.

Original Problem Statement: The inability of mangroves to grow in a disused shrimp pond is the result acid sulfate soils in the substrate of the shrimp pond which is caused by the lack of attention paid to rehabilitate shrimp ponds after abandonment due to budget constraints and lack of knowledge.



Activity 6

contacting organizations & decision makers

Questions: What are acid sulfate soils? Why can't mangroves grow in acid sulfate soils? Can any types of mangroves grow in acid sulfate soils? If so are these mangroves appropriate species to use in mangrove rehabilitation? Can acid sulfate soils be rehabilitated to support mangrove growth? Who owned the mangrove in the first place? Why didn't they rehabilitate the mangrove after the shrimp pond went bankrupt? Are they willing to work together to fix the problem?

2. Prioritize the information your class needs in order to better understand and work towards a resolution of the chosen problem.

3. Discuss what agencies, organizations or individuals would be appropriate to contact to find answers to your questions

a. Good contacts include local environmental NGO, international environmental NGOs, community groups with experience in problem area, local government agencies such as the Department of Natural Resource, academicians, nature lover's groups, local businesses with an interest in problem area such as dive operators, charcoal producers etc.

b. Useful resources for finding contacts are: phone books, governmental directories, newspapers, magazine articles, internet, government workers or community members.

4. Once you have identified contact persons or organizations, the next step is to phone, write or visit (whatever is most appropriate for the situation). If you wrote letters, read your letters aloud in class before sending them to the contact person. To prepare for a visit practice what you will say in front of the class using a role playing exercise with someone playing the student, someone else the NGO member, the professor etc.

5. Search for contacts or other information leads. Often, people working in government, academia and NGO's have developed a network of contacts that students might also utilize.

6. Report the results of your inquiries to the whole class. Be certain to discuss and analyze the information that each student (or group of students) presents.



7. Some additional suggestions:

a. Because of their interdisciplinary nature, complex issues may require several rounds of information gathering. You will need patience and persistence!

b. Keep a record of phone numbers and addresses, when people were contacted, and the subject of the conversation or letter for later reference. (See Appendix I: Community Resource Sheets)

c. Consider asking one or more contact persons to make a presentation to the class/group. This is an excellent way to learn about an issue.

Discussion Questions:

- ? Were the organizations and decision makers you contacted helpful to you?
- ? How could they have been more helpful?
- ? What surprised you in this process?

Activity Six Alternative: Community Resource Sheets

If your group does not have time to complete activity six "Contacting Organizations and Decision Makers" you may substitute by filling out the "Community Resource Sheets," provided in Appendix I.



Activity 7

developing an action plan

Objectives:

- ❖ Identify a variety of potential stakeholders to resolve the identified problem
- ❖ Select an appropriate and viable action to implement.
- ❖ Outline specific steps in the implementation process.
- ❖ Build group decision-making skills.
- ❖ Develop research skills.

Materials: Example of an Action Plan provided in Appendix II

Time: 120 minutes

Background Information: Once you have selected a problem and conducted some preliminary research, the next step is to develop an action plan to solve it. It is very important that the class carefully determine realistic goals and objectives for the action plan. How will you know when you have been successful?

Some students will have very ambitious goals for their Mangrove Action Project. Students and teachers will need to determine what is feasible for the class to undertake. Raising awareness amongst classmates about an environmental issue is a viable project goal in itself. However, solving any environmental problem is challenging and time consuming, requiring commitment and patience.

Does your class have the time? If your class has the time and commitment, and has set a realistic goal for the action plan, the problem solving experience should be very rewarding and exciting. Many students and teachers say that working on an action project is the most fun and interesting type of education they have ever experienced!

Procedures:

1. Brainstorm possible actions to address your chosen problem. You may benefit by learning more about the various levels of action-taking available to you. Some possible actions include:

a. Raising Awareness: Used to try and convince others that a certain course of action is correct, or that certain behaviors need to change. Raising awareness can take the form of a reporting of facts, hands-on awareness building, or an emotional appeal. Examples include letters to the editor of a paper, presentations to classmates, parents, school boards, or at a village meeting, posters, pamphlets, videos, songs...

In the case of raising awareness about mangroves, students may choose to inform the community at large of the economic value of a healthy ecosystem or even go so far as to set up an example of a livelihood alternative that conserves natural resources (is sustainable) and at the same time provides a significant economic benefit to practitioners (for examples of sustainable livelihood alternatives refer to "Utilizing Different Aquatic Resources for Livelihoods in Asia.")

b. Livelihood Alternatives: Often times in developing countries, coastal villagers will be too concerned about their livelihoods to assist students in conservation activities, unless they see it is in their best economic interest.

c. Political Action: Includes any strategy that pressures political groups or government entities to take certain action. Distributing petitions, writing letters to political figures, supporting an environmental referendum, and speaking before the city council or the school board are all examples of political action.

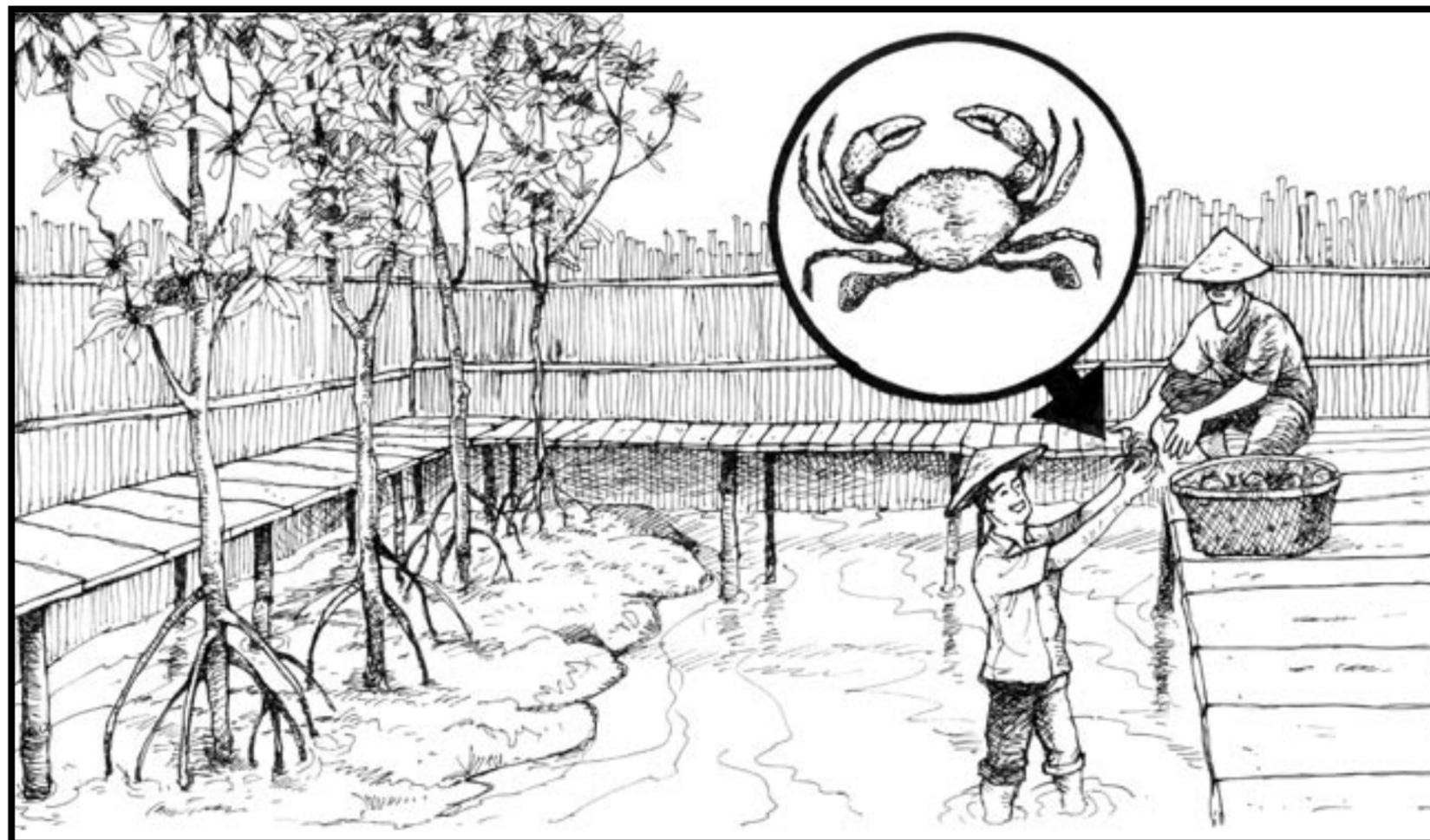
d. Ecological management: Any sustained physical action to improve the environment is ecological management. Long-term efforts to pick up trash along the beach, plant mangroves, or create a protected area are all types of ecological management.



Activity 7 developing an action plan

Example #1

Demonstrating the value of a healthy mangrove forest may be a matter of calculating the short term value of wood versus the long term value in terms of fisheries, shoreline protection, traditional medicines etc. Local universities or the internet are a good place to search for such cost-benefit analyses.



Example #2

Setting up a small mangrove friendly business is an excellent action project, that can both raise funds for your school/group and give students/participants relevant experience in small scale business, marketing and economics. Examples of mangrove friendly businesses include a fruit drink stand using the endosperm of the Nypah palm, or fattening mangrove crabs in bamboo cages in the mangrove forest.



Activity 7

developing an action plan

2. Another way to help your class prepare an effective action plan is to learn from experiences of others. We have provided a copy of a newspaper article in Appendix III which describes various actions taken by Yadfon Association and local fisher-folk communities in Southern Thailand. You can evaluate this case study by following the guidelines in Appendix III. Apply what you learn from this example to your own problem solving process.

3. After you have generated possible strategies, develop action-taking criteria, just as you did to select an appropriate problem. Some criteria to consider include:

- How many steps does this strategy involve?
- Does this strategy involve the whole class?
- How will the community react to this action strategy?
- What level of intervention is being considered? Is the action aimed at personal changes, school level changes, or larger-scale changes in the community?

4. Select one or more action strategies based upon a consideration of these criteria. Be extremely conscious of the issue of success. If you select a strategy which you cannot possibly accomplish due to time or other constraints, you will feel discouraged. This may be the first experience with problem-solving for many students; help reduce the likelihood of failure, so that everyone in the group becomes excited about future problem-solving opportunities.

5. After you have selected an appropriate Mangrove Action Project, clearly state the problem and the strategy you have adopted to solve it once more.

6. Finally develop a time-line and a list of step-by step procedures to aid in implementing the action project. Also, consider what kinds of additional information might be helpful.

Discussion Questions:

For your action plan, answer the following questions:

- ? How effective will this option be?
- ? How long will it take to implement each step of your action plan?
- ? How interested are you in this action plan?
- ? Do you and others in your group have the skills and resources needed to implement (do) this action plan?
- ? How much community support are you likely to have for this action plan?
- ? To what extent does this action plan address the cause of the problem?
- ? How long-lasting a solution will this action produce?
- ? How do the benefits of this action compare with any negative consequences?



Activity 8

action taking

Objectives:

- ❖ Implement the Action Plan

Materials: All the materials used previously may be needed, depending on the problem and actions chosen.

Time: Variable, depending upon the action plan.

Background Information: The action phase of the problem-solving process is often both an exciting and frustrating experience. But with patience and commitment, it can be a rewarding one. The specific nature of the project will determine how to best implement the action plan.

Procedures:

1. Utilize the action plan to guide the activities. Refer to the time-line and list of step-by-step procedures developed in Activity Seven.
2. Be sensitive to the frustrations and difficulties you may experience. Be supportive and encouraging.
3. Be considerate of conflicting viewpoints. If the project goal is at all controversial, expect some people (perhaps even members of the class) to resist your efforts. Try to think broadly and empathize with a number of perspectives as you proceed.

Consider the following questions:

- a. Who will welcome our project and why?
- b. Who will oppose the project and why?
- c. Who might not listen to our statements? What is our best approach with these people?
- d. How can we better understand other people's views?

4. What special planning or preparation does the project require?

- a. Will the project involve making a presentation at a local government or village meeting, or to a board of directors? This is an excellent opportunity to experience participatory democracy and develop public speaking skills. Do-role plays or mock meetings (see MAP Curriculum Activity 5-B: "Mangrove Controversy: Town Hall Meeting") to get ready for your presentations.
- b. Will the project require significant research off school property such as visits to local business, the library, another coastal area? If so it would be wise for the teacher/facilitator to visit the area before taking students there to look for potential safety issues.
- c. Will the project involve the use of the media? Local newspapers can be helpful to a project by increasing public awareness of an issue. However, the media often prints stories without researching the facts. Make sure the information you provide the media is truthful.

Discussion Questions:

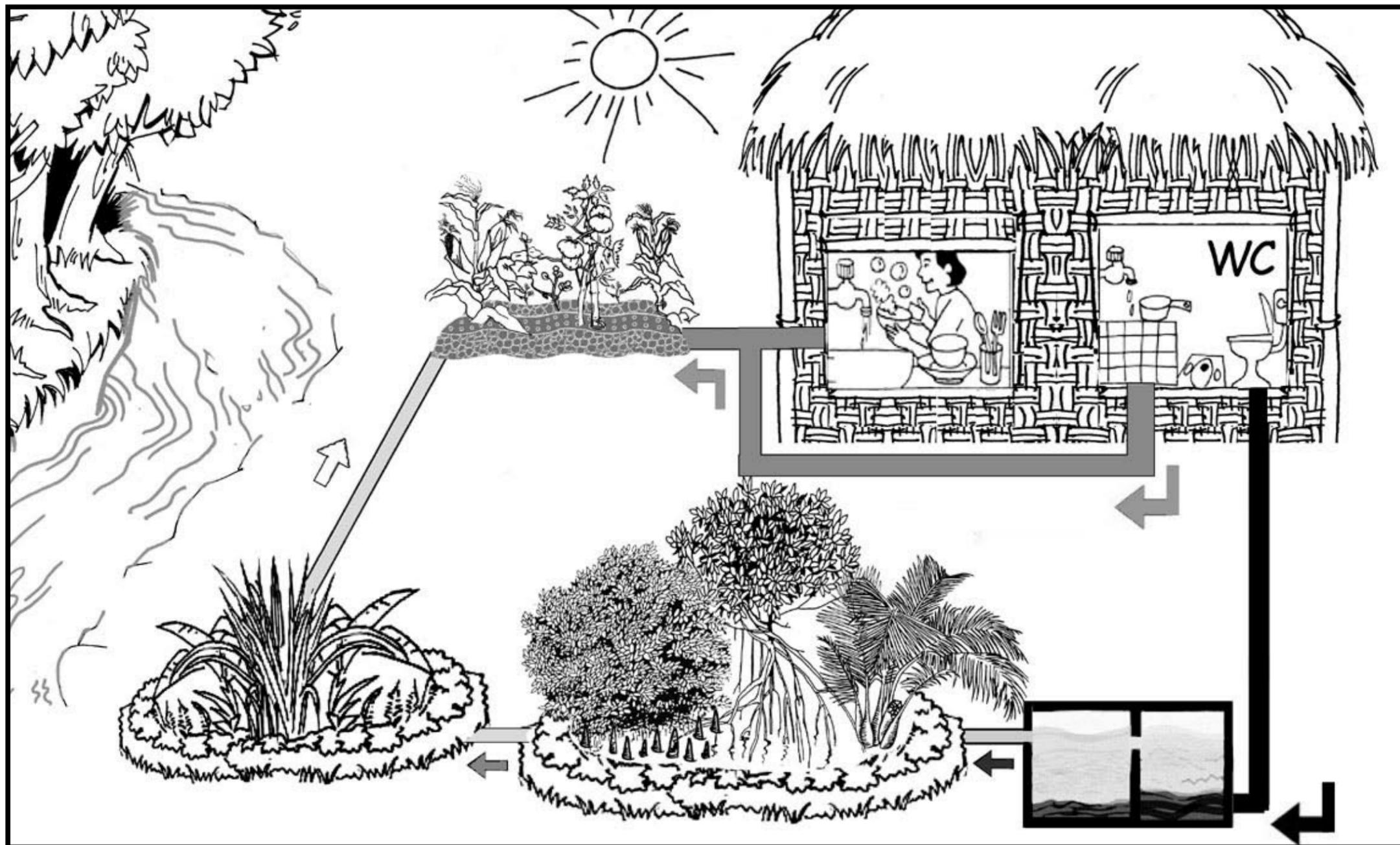
- ? Were you successful in the actions you took?
- ? How might you have been more successful?
- ? Was your class interested in the taking of action?

Activity 8 Alternative: "Action Taking Case Study"

If your group does not have time to take action/carry out a mangrove action project after, you may substitute the activity called Activity 8 Alternative: "Action Taking Case Study," which can be found in Appendix II at the end of this book.



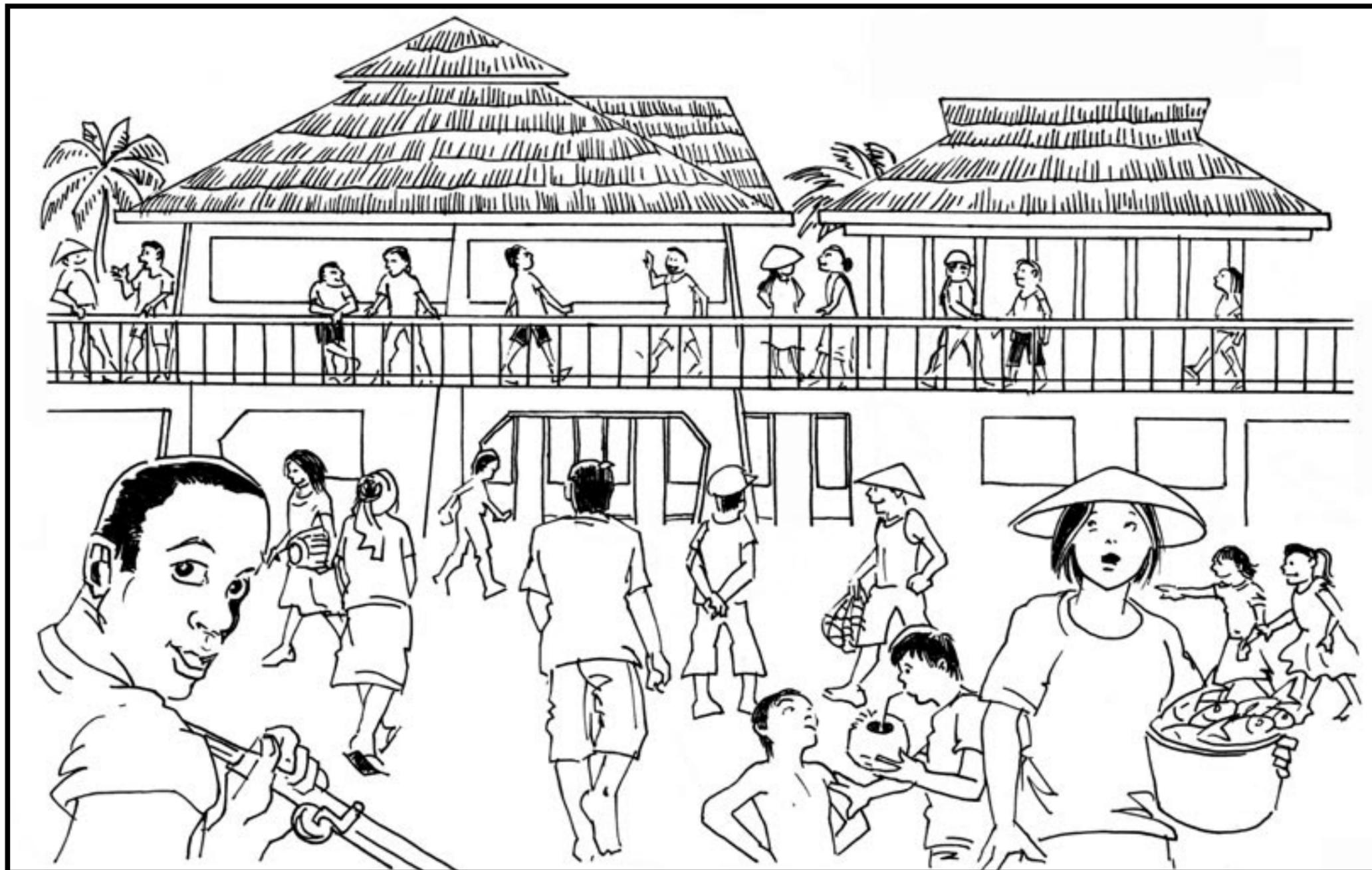
Activity 8- action taking
example one: Waste Water Gardens™



Waste-Water Gardens™ A community who has determined that household or industrial septic waste is a problem in their community has decided to install a simple, low-cost waste water treatment system. This system designed by the Planetary Coral Reef Foundation called "Waste Water Gardens" utilize mangrove and other wetland plants to clean septic water of bacteria, nitrates and phosphates before returning the water to the environment. For more information on wastewater gardens go to www.pcrf.org.



Activity 8- action taking
example two: Coastal Community Resource Center (CCRC)



Coastal Community Resource Center: The creation of a community center is a large-scale action, but very useful in focusing conservation and community development efforts. Coastal Community Resource Centers can be used to host environmental education programs, workshops on community based coastal resource management, sustainable livelihood alternatives, or health, and long-term scientific and action research projects.



Activity 8- action taking example three: Improved Cookstoves

Improved Cookstoves: A number of coastal communities over the past several years have partaken in improved cookstove programs. Improved cookstoves are built for two main reasons, to burn fuel-wood or other biomass as efficiently as possible, and to reduce or climate the inhalation of smoke by cookstove users. Thus improved cookstoves benefit both coastal environments as well as the health of a local community. There are many models of improved cookstoves, the palm sugar cookstove model pictured below has been built in Kuala Indah, North Sumatera and Tiwoho, North Sulawesi to process sugar from the sap of the Nypa Palm.

ARECOP: The Asian Regional Cookstove Program an Mangrove Action Project are partnering throughout Southeast Asia to help disseminate improved cookstove technology amongst traditional fisherfolk communities. The introduction of improved cookstoves to a region is accomplished through week-long workshops, with technical support for follow-up activities on cookstove modification, dissemination and commercialization.

For more information on improved cookstoves see: www.arecop.com



Activity 8- action taking example one: Mangrove Rehabilitation



Hydrological Mangrove Rehabilitation: These shrimp ponds in Tiwoho Village, North Sulawesi Indonesia were operated for only 6 months before going bankrupt. Left behind were 24 hectares of destroyed mangrove forest. Seven hectares of this area grew back naturally over the years, and another five were replanted by the local community and local schoolchildren. But the remaining 12 hectares could not be planted. Efforts to replant by the Bureau of Land Reclamation and local government failed 5 times (often carried out merely so that government officials could share in project money).

In 2003, Mangrove Action Project, Yayasan KELOLA and local villagers attempted to address the root causes of "Why mangroves will not grow in this area?" It was determined that the dike walls of the shrimp ponds which were left intact were responsible for obstructing a normal flow of tidal waters into the area. A rehabilitation plan was made for the breaching of dike walls in order to restore normal tidal flows which will distribute native seedlings into the area.

For more information on this method of mangrove rehabilitation see:
<http://www.mangroverestoration.com>



Activity 9 follow-up

Objectives:

- ❖ Evaluate the effectiveness of the mangrove action project.
- ❖ Evaluate changes in the condition of the coastal zone.
- ❖ Describe the problem solving process.
- ❖ Consider the applicability of skills gained from involvement in your Mangrove Action Project to future attempts at problem solving.

Materials: Paper, blackboard or butcher paper, pens/crayons

Time: Approximately 40 minutes

Background Information: Evaluation of the mangrove action project and the condition of the coastal zone is a very important part of the learning process. You will benefit from a critical assessment of the impact(s) of your actions, and a sharing of thoughts and feelings about the program.

This wrap-up should serve as an affirmation of the hard but meaningful work your students have done. It will highlight some of the problems you encountered and lead to suggestions which will facilitate future attempts at problem-solving.



Procedures:

1. Use the "plus-minus-change" method to evaluate the effectiveness of the mangrove action project.

a. On the blackboard or a large piece of paper, create three columns and label them "plus (+)," "minus" (-) and "change" (Δ).

b. Have the students consider the question: "How well did our mangrove action address the problem we identified?" Ask your students to list what they liked about the project under the "plus" column and what they did not like under "minus." The "change" column is for listing any changes they would make in the future and how the mangrove rehabilitation program could be improved.

2. Reflection (on the problem solving process you used)

a. Each student should write down a brief:

- ❖ Restatement of the original problem that the mangrove rehabilitation project was to solve
- ❖ Outline of the procedure used to address the problem
- ❖ Summary of the action plan
- ❖ Description of the results of your actions

b. Have a discussion in which participants share their depictions of the teamwork and problem solving process. Use the following questions as a guide:

? Did students' perceptions of the problem solving process differ? If so why? (Was there adequate communication in the class? Was everyone fully involved throughout the entire program?)

? What part of the problem solving process was most difficult or frustrating? Why? What can you do in the future to make it easier?

? How did you feel when you completed the mangrove action project? Were you successful? Why or why not?

? Can you and other students your age do anything to help solve environmental problems in your area? Why or why not?



Activity 9 follow-up

Discussion Questions/Final Reflections:

Directions: The following questions can be used individually, in small groups or as a whole class for general discussion or for reflection activities.

Looking Back ◀ ◀ ◀

- ◀ What were the conditions that first brought your attention to the problem or threat, and what are they now? What has changed?
- ◀ What were some of the challenges along the way and how were they overcome?
- ◀ What new skills, information, or understanding have you gained through this process?
- ◀ How have you changed, as an individual, as a result of this process and project?
- ◀ What would you tell other students about being involved in Mangrove Action Projects?
- ◀ What would you do differently in another project of this type?
- ◀ What would you do the same in another project of this type?

Looking Ahead ▶ ▶ ▶

- ▶ What are the next steps that will help bring a long-term solution to your problem or threat?
- ▶ What groups or individuals might continue working on the problem or threat?
- ▶ Who else should be made aware of the problem or threat at this point?

Appendix I alternative to Activity 6: community resource sheets

Objectives:

- ❖ Identify community resources
- ❖ Gather information related to the problem selected.
- ❖ Learn the importance of sharing information

Materials: Photocopies of the "Community Resource Sheet" from Appendix I.

Time: 30 minutes

Background: Community Resource Sheets are really nothing more than a list of names, phone numbers, institutions, addresses and web sites that can provide technical assistance in various fields of expertise. Resource sheets mean different things to different people. For some people a list of phone numbers and email addresses may be important, while rural villagers may have different types of contact information such as mailing address or a two-way radio address.

Procedures:

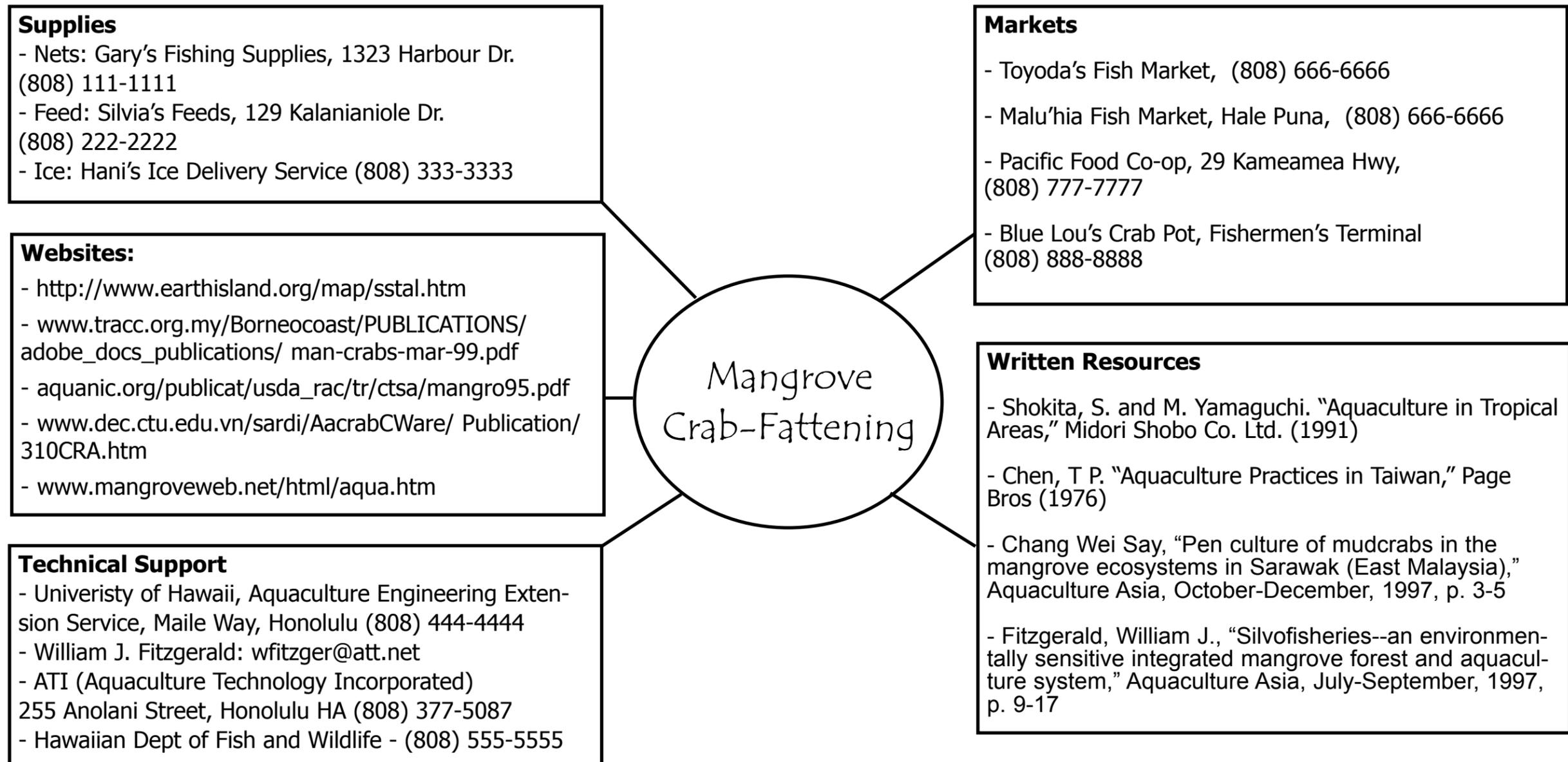
The sheets in Appendix 1 can be photocopied and distributed to workshop participants/students. The first Community Resource Sheet has already been partially filled out as an example. This sheet includes contacts for mangrove rehabilitation (the theme of each sheet should be written in the circle). As this sheet is an example, not all of the information is accurate.

The second Community Resource Sheet is blank and may be filled out by your group. Take 20 minutes to start to fill out the sheets together. You should write in names and organizations along with numbers, street addresses, web addresses and email addresses. If you do not know how to use email, you may still wish to start collecting email addresses and either learn to use email or ask for help contacting a person from a member of local NGO or university student.

You will notice that some participants already have a well developed community network, while others have not yet developed these important contacts. By filling out the sheets together in a large group, the entire group gains access to one another's information.



Appendix I
 alternative to Activity 6:
 community resource sheet sample (note: not all information is accurate)

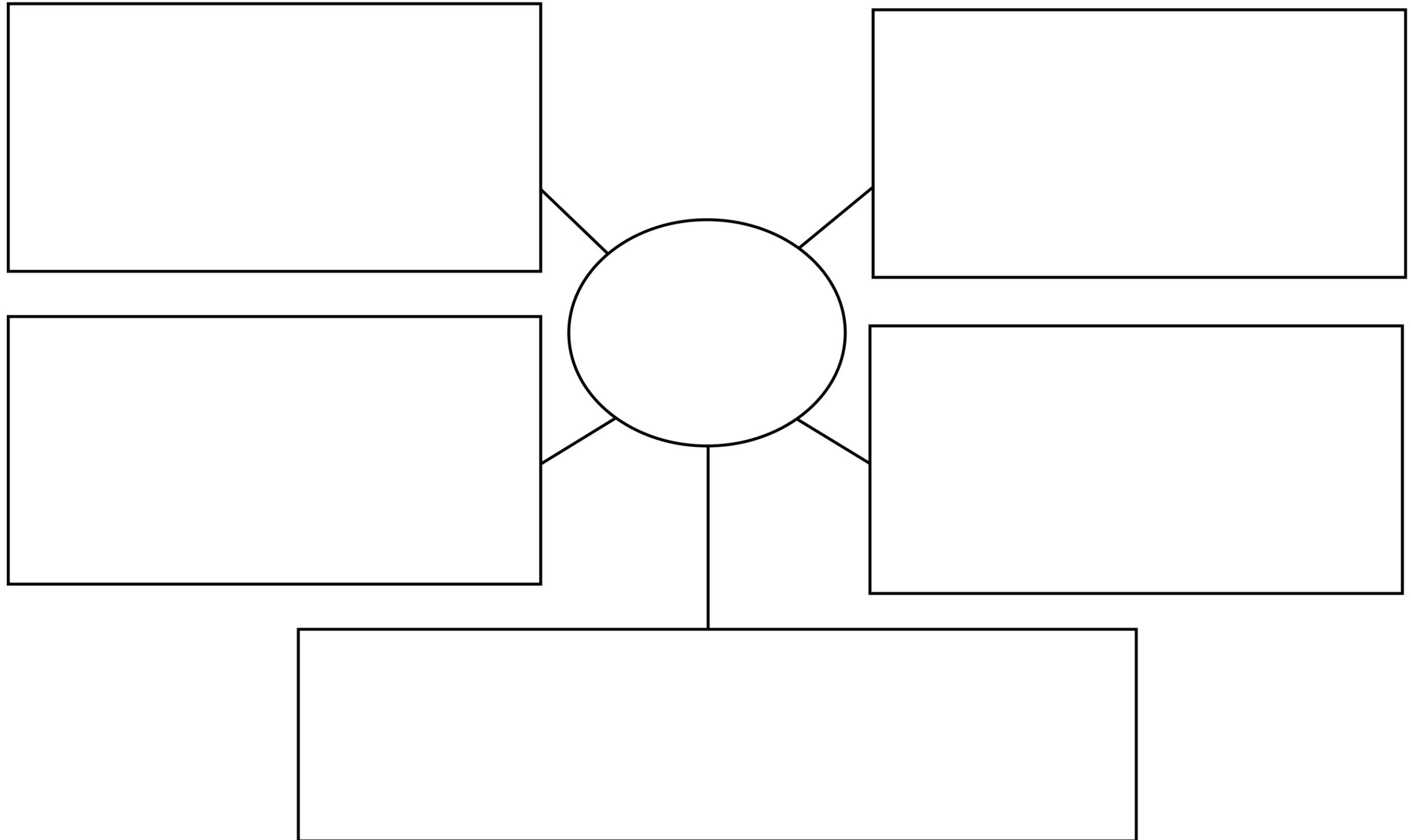


Discussion Questions:

- ? Did you find that filling out a community resource circle was easy or difficult?
- ? Did you find that you already had a lot of contact information in your head that you had never written down.
- ? Do you think you will refer to your community resource circles?



Appendix I
alternative to Activity 6:
community resource sheet (blank)



Appendix II action plan examples

The following action plan was developed for a mangrove rehabilitation program on the island of Sulawesi, Indonesia.

1. Formal talks with all stakeholders in the village. If the local stakeholders are not in support of mangrove rehabilitation, the project will fail. It is important to include them from the onset of the program

2. Survey the locations of the unused shrimp ponds & draw map of the areas. Data gathered in this phase will include land-ownership, historical data on species composition, condition of dike walls, qualitative disturbance to hydrology and distance to nearest natural seed source.

3. Formal talk between community and all other stakeholders. Together with the community, presentations will be made to other probable stakeholders including government agencies with jurisdiction in the region, academicians, local NGOs etc.

4. Bio-ecological, chemical and physical evaluation. This step will also be participatory in nature, and will focus on the collection of detailed bio-ecological, chemical and physical measures. Data gathered during this phase includes; substrate type, chemical parameters of substrate, hydrological data including detailed tidal information, nearby species composition...

5. Creation of rehabilitation plan. Based on data, commitments and agreements gathered from the steps 1-4, the project coordinator, project assistant and chosen representatives from the local rehabilitation team (i.e. NGO members, local government, academicians) will work together to design a draft of rehabilitation plan. Then, the draft will be presented to all local stakeholders and government agencies. The Mangrove Action Project Rehabilitation Team will review the draft before any actions will be taken place on the ground.

6. Implementation of rehabilitation plan. The implementation of rehabilitation plan will follow all procedures included in the document of rehabilitation plan (step 5). The project coordinator will coordinate all works on the ground. Local communities and all other local stakeholders will take part in any aspects of the works agreed.

7. Monitoring and Evaluation Using the "Plus-Minus-Change" method (see Activity 9: Follow-up)

8. Dissemination of Results Creation and distribution of 500 CD-Rom in Bahasa Indonesia and English. Indonesian version will be distributed amongst the 120 NGO members of the Jaringan PELA Coastal and Oceanic Network, as well as government agencies. The English versions will be made available to subscribers of Mangrove Action Projects bi-weekly newsletter "The Late Friday News."



Appendix III alternative to Activity 8 action taking case study

Objectives:

- ❖ Participants will be able to identify problems, root causes and actions
- ❖ To learn how the process of empowerment leads to effective problem solving and action taking

Materials: Case Study "A Raindrop Cleans the Wetland."

Time: 50 minutes

Background Information: Activities 1-9 provided you with some of the skills needed to take effective action. Another way of learning how to take action-the process of action taking is through learning from others who have taken action. The action taking process above is made real through case studies. The following case study offers a real example of an action project.

Although environmental problems reflect the environment and culture in which they occur, many of the approaches to solving problems are similar for related types of problems.

The environmental case study offered here comes from actions taken by Yadfon Association of Southern Thailand. This case study may give hope to others struggling with environmental problems, showing that they too can make a difference.

Procedures:

1. Read the case study below "A Raindrop Cleans the Wetlands."
2. While reading the case study, think about what you have learned in the previous activities 1-9 and as a group or individually:

Underline Problems identified by Yadfon Foundation and local fisherfolk communities

Double underline Root Causes/Deeper Problems

Circle Actions taken by the local fisherfolk community.

"a raindrop cleans the wetlands"

"A Raindrop Cleans the Wetlands" -adapted from an article by Susan Cunningham

Pisit Chansanoh takes great pride in the fact that he has helped impoverished fisherfolk on Thailand's Andaman Sea stand up to a group of World Bank officials who wanted to transform their nearby sleepy port into a powerhouse facility servicing ocean-going fishing ships and "create jobs for everyone." They peppered the bankers with questions: What kind of jobs? Won't these ships create a lot of pollution? How would that affect the livelihood of small fisherfolk? What would be the effect on the local environment? The bankers slunk off and the port development project is on hold.

In the list of achievements by Yadfon, a non-governmental organization (NGO) set up to help impoverished fisherfolk. Pisit Chansanoh (pronounced PEE-zit CHA-nor) no doubt finds most significant that encounter with richer, more powerful people, because it illustrates the outcome of a long process. "Not so long ago, the fisherfolk would not have made such efforts," he says. "Or if they had, they would have failed." It took a great deal of time to build self-confidence and self-reliance in these people with whom he began working in 1985.

When Khun Pisit (Khun is a term of respect for elder Thai men), his wife, Ploenjai (pronounced PAWN-jai), and two friends set up Yadfon in 1985, they decided to research the problems of seven remote coastal villages in Trang province [Southern Thailand]. While there were other needy groups, these fishing families were the poorest of the province's poor, ignored by government and development organizations alike. Pisit saw their poverty and degraded environment as symptoms of a deeper problem" "They lived together but they had forgotten how to work together and it was inconceivable that they would burden authorities with their problems, no matter how justified."



"a raindrop cleans the wetlands"

The Road to Empowerment

That the fisherfolk were Muslim in a predominantly Buddhist nation contributed to their apathy. While there is little open animosity between Buddhists and Muslims, Muslims can not avoid being trapped in a rigidly hierarchical society, in which status is often defined by displays of wealth. Because they were both poor and Muslim, the fisherfolk "felt they were second-class citizens," Chansanoh recalls.

The villagers were certainly aware of their problems. The arrival of big trawlers since the 1960s had depleted their catch and damaged their nets. They knew that the trawlers often fished illegally within three kilometers of the shore, but felt it was useless to complain since the trawler owners probably had powerful connections in government. Many were in debt to the middlemen who bought their fish. Some of these middlemen were what Thais call "influential people" - mafia sorts with links to government - who could then hand-pick headmen or instruct villagers how to vote.

The poorest villagers labored on the trawlers or worked for mangrove concessionaires, cutting trees for the production of charcoal. Old-timers realized that with a dwindling supply of mangrove trees, medicinal plants, fruits, honey and nipa palm (which has multiple uses including thatch, cigarette papers, palm sugar, starch and vinegar) had disappeared as well. Those without legal title to use or own their land feared that they were vulnerable to eviction, despite having occupied their homes for more than a century.

Villagers were less aware that the destruction of mangrove forests had also affected the supply of seafood. Mangrove trees with their tangled roots, exposed at low tide and submerged at high , are nurseries for fish, crabs and shrimp. The disappearance of the mangrove led to erosion and silt that choked seagrass and coral. The fishing practices of small fishermen themselves (using dynamite and cyanide, and pushnets that a small motorboat can push along the sea floor) had directly damaged coral and the twelve

species of seagrass - which had once sheltered and fed fish, shellfish, squid and turtles.

Yadfon originally had very little knowledge of coastal ecology, but had developed basic premises of how they should operate. Khun Pisit felt that Yadfon should encourage the formation of community organizations that could initiate and carry out their own projects. Yadfon itself should remain small. The staff of Yadfon spent long stretches living in the villages. "We spent the first year talking," Chansanoh recalls. "Meetings lead to wisdom. They make one think," he says.

Eventually the communities decided that they most urgently needed wells, since they suffered severe drought in the dry season. Yadfon, with aid from the Canadian government, paid for the materials, aided in construction and recruited secondary school students to help.

Subsequent experiments with small revolving funds had mixed success. Some of the very poor were able to borrow from the funds supplied by fellow villagers, buy simple fishing boats, and support themselves from fishing. Others were unable to pay back their loans. Chansanoh nonetheless believes the projects were worthwhile because "emerging from these activities were a number of leaders, whose later role in the community was equal to that of their middle-class counterparts in the villages."

During this time, villagers had been meeting among themselves as well as with Yadfon staff, development workers from other areas and academicians with an interest in and knowledge of fisheries and forests. A group of people in Tung Taseh village decided to try to revive their badly degraded communal-use mangrove forest.

The rest of the marshy mangrove area was leased by the government to concessionaires. The group petitioned government officials to prohibit further tree cutting in the communal area and demarcate the boundaries with the concessionaires' portion.



"a raindrop cleans the wetlands"

Replanting the Mangrove Forests

In 1986, the group took a different tack. On their own, they started replanting the mangrove tree, *Rhizophora* sp., to show their genuine concern for the forest. They explained their reasons to fellow villagers and invited officials to take part. Ultimately the provincial governor was invited. According to Chansanoh, the governor was shocked by his first visit to such an impoverished place, rife with signs of child malnutrition, but the enthusiasm of the villagers persuaded him to support their requests for legal demarcation of the communal and concessionaires' forests.

During this time, an inter-village network sprang up as leaders of the seven Yadfon villages began meeting and exchanging ideas. Yadfon also sponsored training workshops and took the villagers on study tours to see how other villagers coped with coastal development. By 1989, the initial 95 hectares of mangrove forest near the villages of Tung Taseh and Laem Sai were recovered.

The Forestry Department declared the area a "community managed mangrove forest." It remains quite a distinction since it is still unclear whether the government recognizes community management of any other type of forest. The designation has since been extended to six reclaimed forests in the Yadfon target area. The twice-yearly planting parties are conducted in festival style. Provincial and district officials, fishery and forestry officers are invited. The officials lend an air of importance and endorsement to the activities.

Where "Top-Down" has Bottomed-Out

Pisit Chansanoh believes the Yadfon approach is simply pragmatic. Coastal conservation, he says, depends on the concerted efforts of five groups: local communities, civil servants, academics, media and small business people.

The buzzword of the year, "stakeholders," has genuine meaning here. For villagers, the stake is their livelihood and quality of life. Initiatives must originate with them because "top-down hasn't worked."

Civil servants now have a stake in enforcing the law, in part because they are watched by the media, which has given a wide

and favorable coverage to Yadfon's activities. For marine and forestry scientists, their very subjects of study are endangered. With their short term vision, businesses are the hardest to reach and a nit that Pisit has yet to crack.

Following the mangrove strategy—displaying their sincerity and self-reliance coupled with multiple community discussions—villagers set out to protect coral and seagrass beds. Dead coral takes hundreds of years to replace, but with education campaigns and peer pressure, most small fishermen swore off dynamite, cyanide and the use of destructive nets near existing reefs. Unlike coral, seagrass beds recover quickly. At first, the boundaries of seagrass beds were designated with the trunks of coconut trees. This was a no-go area for boats with destructive "push-nets" that scraped the sea-floor. Eventually the Fisheries Department contributed buoys and signs.

The rewards are obvious to local people. Fish, shellfish, squid and turtles returned. Fishermen no longer have to travel so far out to sea, thus saving petrol and up to three hours traveling time per day. With simple wooden traps or handheld nets, children catch crabs in the seagrass and mangroves and can earn 300 baht (\$8) in an afternoon. They once earned the same amount from a day chopping mangrove trees.

Data on the increases in marine life, income and so on, is gathered by the villagers themselves. Before launching any project, the villagers always undertake considerable "Participatory Action Research." It may entail mapping seagrass beds or surveying the populace to learn who derives income from what resource.

Bung Hed Hawa, a leader in the village of Ban Chao Mai, recalls, "when Yadfon first told me about the importance of seagrasses, I thought they were crazy. Now I'm telling others that seagrass, coral, mangroves, crabs and turtles are very important. You can't have rich corals without the mangrove forest. You can't have crabs and fish without seagrass."



"a raindrop cleans the wetlands"

Putting Empowerment to Practice

With a history of success and cooperation behind them, fisherfolk were able to take on the large trawlers trespassing in the three-kilometer coastal zone, often using destructive and illegal fishing gear, such as dragnets and purse seine nets. The villagers' usual tactic is to putter out in several longboats and politely inform the trawler crew of their error. The Fisheries Department has always pleaded a lack of manpower to enforce the law. Through shame or duty, the community patrols have spurred officers to become more active.

Not that victories for any small-scale fisherfolk are permanent. They must remain vigilant, especially now that the nation is mired in financial depression. In early August 1998, a group of commercial trawler fishermen met with the Trang provincial governor, Phinyo Charlermond, urging him to reduce the protective zone from three to one kilometer. No matter that it is a national law and that the governor did not have power to amend it. Earlier in the summer, trawler owners on the east coast were making similar demands. The governor appeared on the news to make a public statement in opposition to decreasing the protected zone, but his statements were ambiguous. In Thailand, it is the sort of opening round that ends up diluting many laws. Small fishermen from thirty fishing communities swung into action. Gathering with Yadfon's they decided to request a meeting with the governor. The governor clarified his opposition to altering the zone. When the fishermen asked him to do so in writing, he went one better and made the revised statement on television.

It was the kind of action that the fisherfolk would never have marshaled fifteen years earlier. Chansanoh says: "The philosophy has started to change in favor of the community-based fishery management. It's not just a few organizations now; it's a movement. While I once would never have expected it the government is now somewhat more open to the concept of local people co-managing resources."

Discussion Questions:

- ? Were you able to identify problems, root causes or underlying problems and actions?
- ? Did the case study above provide you with ideas for your own Mangrove Action Projects?

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