

**A Public Education Strategy
for Proyek Pesisir North Sulawesi**

Bart de Graaf

TR-98/08-E

CRMP Secretariat
Ratu Plaza Building 18th Floor
Jl. Jenderal Sudirman Kav.9
Jakarta Selatan



Phone (62-21) 7209596
(12 lines)
Fax. (62-21) 7207844

www.pesisir.or.id

A Public Education Strategy
for Proyek Pesisir North Sulawesi
by
Bart de Graaf

Funding for the preparation and printing of this document was provided
via the Coastal
Resources Management Project of the USAID-BAPPENAS Natural
Resources Management Program.

Further details of Proyek Pesisir publications can be found at www.pesisir.or.id
Further details of NRM publications can be found at www.nrm.or.id
Further details of CRC publications can be found at www.crc.uri.edu

Printed in Jakarta, Indonesia

Citation:

Bart de Graaf (1999) A Public Education Strategy for Proyek Pesisir North Sulawesi, Training Report, TR-98/08-E, Coastal Resources Center, University of Rhode Island, Jakarta, 67 pages.

Credits:

Photographs:

Maps:

Line Art :

Layout : Kun S. Hidayat

Translation:

Style Editor:

ISBN :

TABLE OF CONTENTS

	ACKNOWLEDGEMENTS	iii
	EXECUTIVE SUMMARY	iii
1.0	INTRODUCTION	1
2.0	GENERAL BACKGROUND INFORMATION ON ENVIRONMENTAL EDUCATION	2
3.0	EDUCATION STRATEGIES AT THE REGIONAL LEVEL	4
3.1	Introduction	4
3.2	Objectives and strategies	5
3.3	Approaches and methods	6
3.4	Specific activities	8
3.5	Recommendations	10
4.0	EDUCATION STRATEGIES AT THE FIELD SITE LEVEL	10
4.1	BLONGKO	10
4.1.1	Introduction	10
4.1.2	Objectives and strategies	10
4.1.3	Approaches and methods	11
4.1.4	Specific activities.....	13
4.1.5	Recommendations	16
4.2	BENTENAN AND TUMBAK	17
4.2.1	Introduction	17
4.2.2	Objectives and strategies	18
4.2.3	Approaches and methods	21
4.2.4	Specific activities	26
4.2.5	Recommendations	31
4.3	TALISE	32
4.3.1	Introduction	32
4.3.2	Objectives and strategies	32
4.3.3	Approaches and methods	34
4.3.4	Specific activities	38
4.3.5	Recommendations	39
5.0	ROLE OF THE PUBLIC EDUCATION STRATEGY IN NRM PERFORMANCE MONITORING	39
6.0	RECOMMENDATIONS	41
	APPENDIX I IMPORTANT ASPECTS IN DESIGNING EXHIBITIONS	45
	APPENDIX II IMPORTANT ASPECTS IN MAKING WORKSHEETS	48
	APPENDIX III INFORMATION CENTERS	49

ACKNOWLEDGEMENTS

I would like to thank the numerous people who have assisted with the development of this public education strategy. Special thanks are provided to the extension officers, Meidiarti Kasmidi, Maria Dimpudus, Egmond Ulaen, Noni Tangkilisan and Christovel Rotinsulu. They provided a lot of input for this report, ranging from information on the educational activities already carried out to ideas for future activities. This information is essential to this strategy. In addition, I would like to thank Ventje Semuel for showing me around Talise while Noni was away. I would particularly like to thank Brian Crawford for all his valuable input, the good discussions we had and the effort he put into editing this report. Also thanks are given to Johnnes Tulungen who will translate this report into bahasa Indonesia. Finally, I would like to express my appreciation to Ian Dutton, Chief of Party, for his input, and the entire Proyek Pesisir staff for all the assistance required to produce this report.

EXECUTIVE SUMMARY

Public education plays an important role in natural resources management projects like Proyek Pesisir. The eventual goal of the project is to develop models of sustainable management and use of coastal resources. In reaching this goal local communities, local, regional and national government agencies play an important role. Without the support and active participation of these people the goal of the project will not be reached. Education plays an important role in, among others, providing the people with information, both on the project and coastal issues, teaching necessary skills and stimulating and increasing environmental awareness of people involved in the project.

In a project such as Proyek Pesisir it is important to think of the role education can play and how education can be implemented. In this report, an outline of the education strategy for Proyek Pesisir North Sulawesi is provided. The strategy is subdivided into a strategy at the regional level and a specific strategy for each of the three field sites. In addition to the education strategy attention is paid to general background information on environmental education and the role of the public education strategy in NRM performance.

Education strategies at the regional level

The main target groups of educational activities at the regional level are government agencies like Bappeda, who will play an important role in implementing integrated coastal management in government policies, and the general public, who are tenants of North Sulawesi natural resources and will play a role in integrated coastal management. Another main target group for the future will be schoolchildren in coastal communities.

The main goals of educational activities at the regional level are:

1. Keeping the general public informed about Proyek Pesisir activities in North Sulawesi.
2. Keeping the general public informed about coastal resources issues in North Sulawesi and coastal ecosystems in general.
3. Training of employees of regional government agencies in integrated coastal management issues.
4. Integration of coastal resources issues into formal curriculum of elementary schools (SD) and junior secondary schools (SMP) in the coastal area of Minahasa regency.

Each of these objectives require a different approach and a different set of methods. The approaches for each of them will be:

1. Keeping the general public informed about Proyek Pesisir activities in North Sulawesi.
 - * Articles in newspapers;
 - * Participating in exhibitions;
 - * Information in the Manado office;
 - * Written materials (brochures, fact sheets);
 - * TV programs for the “Lautku, Cintaku” and “Karya Kita” television series. Proyek Pesisir should make two or three high quality episodes for these series. Possible subjects for the “Lautku, Cintaku” series are sea turtles and dugong. A possible subject for the “Karya Kita” series is Manta tow reef survey.

2. Keeping the general public informed about coastal resources issues in North Sulawesi and coastal ecosystems in general.
 - * TV programs for the Lautku, Cintaku and Karya Kita television series. Proyek Pesisir should make two or three high quality episodes for these series. Possible subjects for the “Lautku, Cintaku” series are sea turtles and dugong. A possible subject for the “Karya Kita” series is Manta tow reef survey;
 - * Stories in magazines;
 - * Information in the Manado office.

3. Training of employees of regional government agencies in integrated coastal management issues.
This activity will not be discussed further in depth in this report.

4. Integration of coastal resources issues into formal curriculum of elementary schools (SD) and junior secondary schools (SMP) in the coastal area of Minahasa regency.
Integration of coastal resources issues in formal curriculum should not be implemented at the regional level right away, but it should be tested on a small scale first. Blongko and Bentenan will be pilot projects. After formal curriculum on coastal ecosystems is developed in Blongko and Bentenan, it can be implemented at a regional level.

Education strategies at the field site level

Situations at the three field sites are different. This makes it necessary to develop a public education strategy for each field site individually. The field site Bentenan-Tumbak is a special field site, because it consists of two villages. Because the situation in Bentenan is different from the situation in Tumbak the public education strategy is subdivided into a strategy for Bentenan and one for Tumbak.

Blongko

The main goals of educational activities in Blongko are:

1. Provide the local community with accurate information on marine sanctuaries so that the development of the marine sanctuary can become a success;
2. Integration of coastal resources issues into formal curriculum of the elementary school (SD) of Blongko;
3. Set up the information center, design and work out exhibitions of the center.

Each of these objectives require a different approach and a different set of methods. The approaches for each of them will be:

1. Provide the local community with accurate information on marine sanctuaries so that the development of the marine sanctuary can become a success.

- * Information center. In the information center a permanent exhibition on the marine sanctuary and subjects related to the marine sanctuary can be built.
- * Informative meetings with the community.
- * Comparative study of other marine sanctuaries.

2. Integration of coastal resources issues into formal curriculum of the elementary school (SD) of Blongko.

The elementary school in Blongko has the possibility to integrate coastal issues in the “Muatan Lokal” (local content) curriculum. This curriculum and the necessary materials must be developed by Proyek Pesisir in cooperation with the teachers. A central point in this curriculum for all grades should be coastal ecosystems in general.

3. Set up the information center, design and work out exhibitions of the center.

The information center should provide information on Proyek Pesisir (what is the project about, what are the goals, what are the activities) and on important coastal issues in Blongko. The space in the information center should be divided in several sections. Each section should be used to provide information on a certain topic. Furthermore, a special exhibit for children must be designed.

Bentenan

The main goals of educational activities in Bentenan are:

1. Integration of coastal resources issues into formal curriculum of the junior high school (SMP) in Bentenan;
2. Increasing the knowledge on the mutual interrelationship between human activities such as waste disposal upland and the condition and benefits of coastal ecosystems;
3. Stimulating the community to put social pressure on the two families using destructive fishing methods by providing with backup (both informative and institutional);
4. Increasing the knowledge on the relationship between human activities and erosion and ways to prevent erosion from happening;
5. Set up the information center, design and work out exhibitions of the center;
6. Set up a newsletter.

Each of these objectives require a different approach and a different set of methods. The approaches for each of them will be:

1. Integration of coastal resources issues into formal curriculum of the junior high school (SMP) in Bentenan.

The junior high school in Bentenan has the possibility to integrate coastal issues in the “Muatan Lokal” (local content) curriculum. This curriculum and the necessary materials must be developed by Proyek Pesisir in cooperation with the teachers. A central point in this curriculum for all grades should be coastal ecosystems in general.

2. Increasing the knowledge on the mutual interrelationship between human activities such as waste disposal upland and the condition and benefits of coastal ecosystems.

- * Informative meetings with the community.
- * Clean up activities.
- * Information center. In the information center an exhibit on garbage problems can be built.

3. Stimulating the community to put social pressure on the two families using destructive fishing methods by providing with backup (both informative and institutional).

This should not be done through special educational programs focusing on this particular issue. However, it is wise to refer to the destructiveness of these fishing methods whenever possible.

4. Increasing the knowledge on the relationship between human activities and erosion and ways to prevent erosion from happening.
 - * Exhibits in the information center;
 - * Informative meetings with the community.
5. Set up the information center, design and work out exhibitions of the center.

The information center should provide information on Proyek Pesisir (what is the project about, what are the goals, what are the activities) and on important coastal issues in Bentenan. The space in the information center should be divided in several sections. Each section should be used to provide information on a certain topic. Displayed topics should be erosion and garbage disposal. Furthermore, a special exhibit for children must be designed.
6. Set up a newsletter.

The newsletter should provide information on Proyek Pesisir (what is the project about, what are the goals, what are the activities) and on important coastal issues in Bentenan. The newsletter can be made of a folded A4 paper.

Tumbak

The main goals of educational activities in Tumbak are:

1. Increasing knowledge on the results of destructive fishing methods, both for the ecosystem and the people and providing alternatives for destructive fishing methods;
2. Increasing knowledge on the results of coral mining, both for the ecosystem and the people and providing alternatives;
3. Increasing knowledge on health issues and the interrelationship between human activities and the health situation in the community;
4. Provide the local community with accurate information on marine sanctuaries so that the development of the marine sanctuary can become a success;
5. Set up a small information center in the office of the Kepala Desa.

Each of these objectives require a different approach and a different set of methods. The approaches for each of them will be:

1. Increasing knowledge on the results of destructive fishing methods, both for the ecosystem and the people and providing alternatives for destructive fishing methods.
 - * Informal talks with community members.
 - * Informative meetings with the community.
 - * Information in the office of the kepala desa.
2. Increasing knowledge on the results of coral mining, both for the ecosystem and the people and providing alternatives.

This issue needs basically the same strategy as the issue of destructive fishing methods, mentioned above.
3. Increasing knowledge on health issues and the interrelationship between human activities and the health situation in the community.
 - * Informal talks with the people;

- * Informative meetings;
- * Information on health issues in the office of the kepala desa.

4. Provide the local community with accurate information on marine sanctuaries so that the development of the marine sanctuary can become a success.

- * Information center in the office of the kepala desa.
- * Informative meetings with the community.
- * Comparative study of other marine sanctuaries.

5. Set up a small information center in the office of the Kepala Desa.

The information in the office should be on Proyek Pesisir (activities, goals, outcomes), on coral reef ecosystems (how it works, what people use it for, how this use affects the system and how coral reefs can be preserved) and on health issues (relationship between human activities and health problems).

Talise

The main goals of educational activities in Talise are:

1. Increasing children's knowledge on coastal ecosystems;
2. Stimulating responsible water use and increasing knowledge on the interrelationship between human activities and health;
3. Increasing the knowledge on the relationship between human activities and erosion and ways to prevent erosion from happening;
4. Stimulating a well-thought decision on the development of ecotourism;
5. Set up the information center, design and work out exhibitions of the center.

Each of these objectives require a different approach and a different set of methods. The approaches for each of them will be:

1. Increasing children's knowledge on coastal ecosystems.
 - * Non formal educational programs with children;
 - * Posters;
 - * Comic book;
 - * Integration of coastal issues into formal curriculum.
2. Stimulating responsible water use and increasing knowledge on the interrelationship between human activities and health.
 - * Informal talks with the people;
 - * Informative meetings;
 - * Information on health and water issues in the information center.
3. Increasing the knowledge on the relationship between human activities and erosion and ways to prevent erosion from happening.
 - * Exhibits in the information center;
 - * Informative meetings with the community;
 - * Promotion of agroforestry and other sedimentation/erosion prevention methods through demonstration plots.
4. Stimulating a well-thought decision on the development of ecotourism.
 - * Informative meetings with the community;
 - * Discussions in the village.

5. Set up the information center, design and work out exhibitions of the center.

The information center should provide information on Proyek Pesisir (what is the project about, what are the goals, what are the activities) and on important coastal issues in Bentenan. The space in the information center should be divided in several sections. Each section should be used to provide information on a certain topic. These topics can, for instance, be erosion, health issues and ecotourism. Furthermore, a special section for children must be developed.

General recommendations

- * Consistency of products and consistency in the look of Proyek Pesisir outputs should be accomplished.
- * Develop a public education boat for education at the regional level.
- * Make informative displays for hotels in Manado.
- * Posters. Develop one poster on coastal ecosystems that can be distributed to all elementary schools in the region.
- * Compile all Proyek Pesisir publications (brochures, fact sheets, briefing notes, etcetera) in a file. Make a file for every field site and one for the Manado office.
- * Contracting curriculum development. Proyek Pesisir itself is not able to develop curriculum. Therefore contracting is necessary. This contracting has to be well thought out and monitored closely.
- * Creating a function of Environmental Education Officer who coordinates and handles Proyek Pesisir North Sulawesi education activities.
- * Training of the environmental education officer in environmental education is necessary.
- * Training for extension officers (and other local people involved in education activities) in designing education activities and didactics is necessary.
- * Evaluation and readjustment of the public education strategy must be carried out on a yearly basis.
- * Incorporation of education strategy in ICM plans of the villages is necessary.
- * Additional technical assistance in subsequent years of the project in evaluation and adjustment of the public education strategy, assisting the environmental education officer, assisting with contracting organizations for the development of formal curriculum on coastal ecology, training for extension officers (and other local people involved in education activities) and organizing a workshop on environmental education.

1.0 INTRODUCTION

The purpose of this report is to outline a public educational strategy for Proyek Pesisir North Sulawesi. The report consists of both short term and long term strategies.

Public education plays an important role in natural resources management projects like Proyek Pesisir. The eventual goal of the project is to develop models of sustainable management and use of coastal resources. In reaching this goal local communities, local, regional and national government agencies play an important role. Without the support and active participation of these people the goal of the project will not be reached. Education plays an important role in, among others, providing the people with information, both on the project and coastal issues, teaching necessary skills and stimulating and increasing environmental awareness of people involved in the project.

Acknowledging the importance of education in a coastal resources management project is the first step in the right direction. The second step is the preparation and execution of the educational component of the project. Education is not just writing a brochure, giving a lecture and putting a slide show together. Good education is more than just a couple of educational activities put together. Especially in a project such as Proyek Pesisir it is important to think of the role education can play and how education can be implemented in the project. Therefore, it is good to think of an education strategy for the project. In this report an outline of the education strategy for Proyek Pesisir North Sulawesi is provided.

Since Proyek Pesisir has activities on both local and regional level, the education strategy will be focusing on these two levels. The strategy for local level consists of separate strategies for each of the three field-sites.

To gather data necessary for the development of an education strategy, all three Proyek Pesisir field-sites, Blongko, Bentenan-Tumbak and Talise were visited. These visits were done with a view to get insight in the local situation, both environmental and social, have an opportunity to talk with members of the local community and obtain inputs from the Proyek Pesisir extension officers and their assistants. Furthermore, information was derived from technical reports of Proyek Pesisir, monthly reports by the extension officers and talks with Proyek Pesisir staff in the Manado office.

This report starts with an outline of some important background information on environmental and public education. This background information is important to be kept in mind when designing, carrying out or evaluating education, no matter on which level or in which situation. These are some basic guidelines for environmental education.

In section three an outline of the education strategy on regional level is given. By regional level is meant the Minahasa regency. Section four contains the strategies for each of the three Proyek Pesisir field-sites. The strategies for both regional level and the field-sites are built along the following structure:

- * an introduction on the site and description of already carried out education activities;
- * objectives and strategies of education and its specific contents related to coastal resources management;
- * the approaches and methods to be used;
- * specific activities to be carried out and;
- * recommendations.

In section five the role of the public education strategy in NRM Performance Monitoring is outlined.

Finally, in section six, general recommendations are made. This section includes recommendations that cannot be addressed to one specific field-site or only to the regional level.

2.0 GENERAL BACKGROUND INFORMATION ON ENVIRONMENTAL EDUCATION

Diversity of environmental education

Environmental education is a concept comprising a great number of activities. In general one can state that environmental education is every single situation in which somebody has the opportunity to learn about the environment. This results in a nearly endless list of activities or situations that can be considered environmental education.

This diversity in environmental education activities has both its advantages and disadvantages. The major disadvantage is the risk of drowning in the sea of environmental education activities and not knowing which activities to select. However, the great variety of activities to choose from should not be considered a burden, but better consider it to be a blessing. The great diversity of possible activities and strategies provides one with the possibility to design a diverse, attractive mixture of educational activities.

A mixture of educational activities is almost indispensable for good and effective environmental education. Education has to do with people learning. It needs no explanation that one person has a completely different way of learning than someone else. It can be stated that there are as many ways of learning as there are people. So, the ideal situation would be that every single person should be approached in his own unique way. Again, it may be obvious that this cannot be accomplished in most cases. However, by using different methods of teaching a community you can reach more people than in a situation where only one method is used. One person might learn more about coastal ecosystems from reading a book while someone else might prefer to listen to a presentation on coastal ecosystems. Therefore it is important to combine different teaching methods. Using different methods at the same time enhances the effectiveness of the education. A combination of a lecture and reading material on the same subject is more effective than a lecture alone. One condition, however, is that these methods must be carefully adjusted to each other. It is of no use to give a lecture on coral reefs and providing the people with reading material on the development of tourism in North Sulawesi. What makes a combination of methods strong is the element of repetition. When people are confronted with the same message over and over again they will remember it in the long run.

Another advantage of the great diversity in educational methods is that there will always be a method suitable for the situation you are confronted with. The situation you are confronted with, should always be considered in choosing an educational activity. Important factors making up a situation are: program contents, location, timeframe, educational materials, target group and context. These factors are discussed in more detail in the guide book prepared last year for Proyek Pesisir and Kelola entitled: Pendidikan Lingkungan Hidup: Langkah pertama proses pengembangan Program PLH. These factors should be considered before choosing a particular teaching method. It is simply not possible to use the same method in all situations.

Necessity of a long term strategy

Environmental education should always have a long term strategy. Although we would like to see people changing their environmental unfriendly behavior right away after they were taught not to

behave like that, this will hardly ever happen. Education simply cannot change behaviors overnight. The short term effect of education will be minimal in most cases, however, the long term effect can be substantial. Changes in behavior accomplished by education are much more sustainable than for instance behavioral changes enforced by law.

One education program on the negative effect of bomb-fishing on coral reef ecosystems will probably not lead to all participants abandoning bomb-fishing. It may take several years to change the behavior of bomb-fishers.

The relatively long time it takes before education has its effect, makes a long term strategy necessary. However, the necessity of a long term strategy does not mean that one should not think about short term strategies and activities. A long term strategy should always consist of a number of mutual interrelated short term strategies and activities. All these short term activities and strategies together should eventually lead to the long term goal.

Let us have a look at the issue of bomb-fishing again. The long term goal of education on bomb-fishing will be to convince the people using bombs to abandon this fishing method and replace it by an other, less harmful fishing method. The long term strategy should focus on reaching that goal. However, to reach that goal it is necessary to set goals for the shorter term too. The short term strategies can be considered steps on the way to the eventual long term goal. In the case of bomb-fishing the first step could be raising the level of knowledge of the people on the effects of explosions on coral reefs. A second step could be focused on increasing the awareness of the importance of coral reef ecosystems for coastal communities. This again can be followed by a next step, and so on, eventually leading to people not only knowing that bomb-fishing has negative effects on the coral reefs, but also behaving in an environmental friendly way.

So, education should have both long term strategies and shorter term strategies. When only paying attention to the long term you will end up doing nothing. When only paying attention to the short term, you will end up doing all kinds of activities, without knowing where you are going. To make sure that all the short term steps are mutually interconnected and will lead to the eventual goal in the end, follow up activities should be thought of all the time. You should always ask yourself the question: What will the next step be? This follow up can be another education activity or something else. A follow up activity of an educational program on marine sanctuaries can, for instance, be the development of a marine sanctuary.

Education in combination with other means to change behaviors

Education in itself may not be sufficient. Especially when the objective is to change behaviors. Education cannot make someone do something. A goal of environmental education can be to stimulate people to use the mangrove forests in a sustainable way. But, whether people will indeed use the mangroves sustainably is up to the people themselves. Education cannot make them do it. Education only can try to give people guidance and knowledge to enhance the possibility that they choose themselves to use the mangroves in a sustainable way. Hence, the education program should be combined with other management strategies to achieve sustainable use of coastal resources.

Despite its relative weakness, education can be quite effective when used in combination with other means. Proyek Pesisir is a good example of a combination of several means in which education can play an important role. Proyek Pesisir is all about raising awareness of the people about the importance of a healthy coastal ecosystem for the wellbeing of both humans and all other living organisms. To do so, Proyek Pesisir uses a full range of means, including finance, technical support, government

regulations and education. In a project like Proyek Pesisir, the role of education is raising the level of knowledge of the local communities, providing information on the project and major issues in the field and building and increasing the environmental awareness among local communities.

To make sure that education is used effectively, it should always be adjusted to the other activities in the project. Then education can be of great support to the project. However, it is of no use to do education just because you think you have to. The contribution of education to the project should always be considered.

Participatory methods

As seen earlier in this section, environmental education comprises a enormous amount of activities. Everyone is free to choose the method he thinks to be most suitable for the situation he finds himself in. Every single situation requires its own unique mix of educational activities to be effective. However, in general, it can be stated that the effect of environmental education will increase the more participatory it gets. People generally learn more from doing things and experiencing nature themselves than from being taught in a lecture by some professor or teacher. Therefore it is recommended to use as much participatory methods as possible. Sometimes it just is not possible to use participatory methods, but when it is possible, take the people to the field or let them discuss issues they consider important.

Emphasize the positive

Education is not telling people what is wrong and what they are not allowed to do. That is law. When the sole message of your education would be: Do not use explosives to catch fish, you would better not start teaching this program. The effect would probably be minimal. People probably say: “Well, I have to eat, don’t I?”

Environmental education should always provide people with an alternative to the behavior you want to change. So, instead of only saying not to use explosives, provide the people with alternatives for their current behavior. Another important aspect is trying to emphasize what the people have, instead of emphasizing the things they do not have. It is better to take the healthy coral reefs as a starting point for education instead of already degraded coral reefs. This is particularly important in North Sulawesi, where resource conditions are still quite good, and have not yet been severely degraded. However, unsustainable coastal resource use practices are present in all the field sites. It is important that people feel they can do something to preserve nature. Therefore they need alternatives for unsustainable behavior and insight into the beauties of nature.

3.0 EDUCATION STRATEGIES ON REGIONAL LEVEL

3.1 INTRODUCTION

The regional level is one of the three levels Proyek Pesisir is working on and one of the two levels discussed in this education strategy report. The regional level is important for Proyek Pesisir North Sulawesi, because when the activities at the field site level become a success, the activities might be expanded to a more regional scale. Therefore it is necessary that Proyek Pesisir North Sulawesi pays attention to education strategies at the regional level.

The main target groups of educational activities on regional levels are government agencies like Bappeda, who will play an important role in implementing integrated coastal management in gov-

ernment policies, and the general public, who are tenants of North Sulawesi natural resources and will play a role in integrated coastal management. Another main target group for the future will be schoolchildren in coastal communities.

Until today, Proyek Pesisir has carried out several educational activities at the regional level. Employees of government agencies have participated in several training's, workshops and seminars on coastal resources management provided by Proyek Pesisir North Sulawesi. Another obvious educational activity has been the participation of Proyek Pesisir in the TVRI television series "Lautku, Cintaku". Proyek Pesisir has provided material for eight episodes of this television series, which is broadcast in North Sulawesi. Furthermore the Manado office of Proyek Pesisir provides information to a wide audience through reports, brochures, fact sheets and a library. In this section, an education strategy at the regional level will be outlined. This strategy will be based on the activities already carried out and still continuing.

3.2 OBJECTIVES AND STRATEGIES

In education activities carried out in the first two years of Proyek Pesisir the main target groups at the regional level have been government agencies and the general public. In the future, these two target groups will still be central target groups. However, a new target group in the future will be schoolchildren in elementary school (SD) and junior secondary school (SMP).

The main goals of educational activities at the regional level will be:

1. Keeping the general public informed about Proyek Pesisir activities in North Sulawesi. Although Proyek Pesisir is focusing on the three field sites, eventually the goal is to have sustainable coastal resources management in a wider area. Therefore it is important that people other than living in the field site villages know what Proyek Pesisir is about and what the activities are. When people already know the project it is easier to get them involved in the project in a further stage. When only focusing on people in the field site villages Proyek Pesisir might run the risk of other people thinking "I have nothing to do with Proyek Pesisir." In keeping the general public informed Proyek Pesisir can use, among others, local media, such as local newspapers, magazines, radio and television, participate in exhibitions and provide information in the Manado office.
2. Keeping the general public informed about coastal resources issues in North Sulawesi and coastal ecosystems in general. In the development of sustainable coastal resources management plans it is necessary that the people know what the coastal issues are that have to be dealt with. Without people having proper knowledge on coastal issues you cannot expect them to manage coastal resources effectively. Since all people in the Minahasa regency do have influence on coastal ecosystems they should know how these coastal ecosystems function and how their behavior affects these systems. The objective is to provide a lot of people with basic information on coastal issues in North Sulawesi. Proyek Pesisir does not have the means to provide the general public in the Minahasa regency with information on a small group or individual basis. Therefore Proyek Pesisir will mainly use mass media means to provide the general public with broad information on coastal issues in North Sulawesi.
3. Training of employees of regional government agencies in integrated coastal management issues. The regional government offices (Bappeda) are important actors in the implementation of coastal resources management in politics. Therefore it is necessary that they do understand what integrated coastal management is about. Besides participating in training it is required

that government agencies are informed about Proyek Pesisir. This can be taken care of by providing government agencies with written information and regular visits of government employees to Proyek Pesisir field sites.

4. Integration of coastal resources issues into formal curriculum of elementary schools (SD) and junior secondary schools (SMP) in the coastal area of Minahasa regency. Children are the leaders of the future. Therefore it is important that they have insights into coastal issues. When they start learning about the importance of coastal ecosystems, its assets and the threads upon it when still young, they can become good tenants of coastal ecosystems for the future.

The integration of coastal issues into the formal curriculum obviously has a long term strategy. Integration will be piloted in the Proyek Pesisir field sites first. When the results at the field site level are satisfactory attempts can be made to expand the programs to schools other than the schools in the field sites. For integration of coastal resources issues into formal curriculum at the regional level, cooperation with the department of education (Depdikbud) will be necessary.

3.3 APPROACHES AND METHODS

Each of the four goals and objectives mentioned in section 3.2 require a different approach and a different set of methods. The approaches for each of them will be discussed in this section.

1. Keeping the general public informed about Proyek Pesisir activities in North Sulawesi.

The approaches and methods to be used to reach this goal are basically the same as have already been carried out in the past, namely provision of information through:

- * Articles in newspapers. Whenever Proyek Pesisir has a special event coming up, such as the official opening of the marine sanctuary in Blongko or the COTs cleanup in Bentenan, it is good for Proyek Pesisir to have it covered by a journalist of the Manado Post or other newspaper. Proyek Pesisir should try to get an article on the project in the newspapers, so that a large audience knows what the activities of Proyek Pesisir are.

- * Participating in exhibitions. Whenever there is an exhibition on coastal issues or issues that can be related to coastal issues, Proyek Pesisir can participate in the exhibition. An example is the exhibition for the International Year of the Ocean. By participating in exhibitions Proyek Pesisir can reach a great number of people. When the Proyek Pesisir exhibit is well designed it can have a great informative function. Important aspects in designing an exhibition are outlined in Appendix I.

- * Information in the Manado office. The Manado office can be used as a location for a permanent exhibition on Proyek Pesisir. The information boards can be used to provide up-to-date information on Proyek Pesisir activities to whoever comes walking into the office. Keeping these information boards up-to-date is indispensable. These information boards can have more detailed information than the ones used for exhibitions. People coming into the office can be considered already interested in the project. This usually means that they are willing to spend more time looking at and reading information boards. Besides information boards the Manado office can provide information through oral explanations, written materials such as brochures, fact sheets and reports, and the library. The number of people reached through information provided in the Manado office is far less than for instance an article in the newspaper or a television program. However, the information can be better adjusted to individual people and be more in depth.

- * Written materials (brochures, fact sheets). Written information materials can be used to give

global information on the project. The information in both brochures and fact sheets should be focused on a wide audience. Therefore the information should not be too detailed or written in scientific language or jargon.

* TV programs for the “Lautku, Cintaku” and “Karya Kita” television series. These TV series are a splendid opportunity for Proyek Pesisir to get its work communicated to a wide audience. The program, however, should not fully focus on Proyek Pesisir. The main focus of the programs should be a particular coastal issue or particular activity. Nevertheless this does not mean that the audience should not know that the program is a Proyek Pesisir initiative.

2. Keeping the general public informed about coastal resources issues in North Sulawesi and coastal ecosystems in general. The approaches and methods to be used to reach this goal are basically the same as have already been carried out in the past, namely provision of information through:

* TV programs for the Lautku, Cintaku and Karya Kita television series. Proyek Pesisir should prepare a list of possible subjects for both these television series. For educational purposes it would be good to have two or three high standard programs. These programs can, besides being broadcasted by TVRI, be used as supporting material to other educational activities. Besides these high quality programs Proyek Pesisir can be involved in other episodes of the series as well.

* Stories in magazines. This can be considered either a regional or a national effort. It should not necessarily be regional distributed magazines only. It can be national magazines as well. The task of North Sulawesi staff is the gathering of good story ideas. These story ideas should be based on current issues in North Sulawesi. These ideas can be communicated to the Communications Unit at PKSPL-IPB. The Communications Unit should try to get the stories written down and published in a magazine.

* Information in the Manado office. As is the case with information on Proyek Pesisir, information on coastal issues can be provided through information boards in the Manado office. This information on coastal issues should also be up-to-date. Information on coastal issues should not necessarily be separated from information on Proyek Pesisir. The information can be mutually integrated.

3. Training of employees of regional government agencies in integrated coastal management issues. This can be considered training more than environmental education. The approaches should be similar to what already has been done in the past, namely inviting government employees to Proyek Pesisir training and other activities in which Proyek Pesisir is involved in. In addition, government agencies should be kept informed through regular meetings and written information. This activity will not be discussed further in depth in this report.

4. Integration of coastal resources issues into formal curriculum of elementary schools (SD) and junior secondary schools (SMP) in the coastal area of Minahasa regency.

Integration of coastal resources issues in formal curriculum should not be implemented at the regional level right away, but it should be tested on a small scale first. It takes a lot of time to develop and incorporate formal curriculum. Therefore Proyek Pesisir should develop curriculum at the field site level first before implementing it at the regional level. The field sites, in particular Blongko and Bentenan, can be used as pilot projects for incorporation of coastal issues in formal curriculum. At these sites, teachers and heads of schools have already expressed interest and support for cooperating with Proyek Pesisir on curriculum development and integration. The coastal issues can be incorporated in the “Muatan Lokal” (local content) of the formal curriculum. This integration is discussed in further detail in sections 4.1 and 4.2.

After the pilot projects have proven to be a success, efforts can be made to implement these programs on a larger scale. To do so, participation of the department of education is necessary. They should be invited to some of the programs in the pilot projects, so that they can see what the programs are about before they make efforts to implement the programs on a wider scale.

It cannot be expected that the department of education can or will implement the local content on coastal issues all by itself. Support should be given to the department. A good way of doing so is the formation of a core group of teachers and other people involved in the programs from the pilot project field sites. This core group must go out to other schools in the area to introduce the developed programs to the teachers. In this way other teachers can see what the program is about and how it can be carried out at their school. This introduction to every single school in coastal villages (110 in Minahasa, 517 in North Sulawesi) makes eventual implementation easier.

For the introduction to other schools it is necessary that the core group actually goes out to other villages, because then teachers can see what the possibilities in their particular situations are. One way to do it is by developing an education boat. This boat should be equipped with all the necessary materials for the programs. The core group can sail from one village to the other. In every village they can stay for a couple of days and do the programs with the classes of the schools.

The implementation of coastal issues in formal curriculum on regional level after the pilot projects thus requires a twofold strategy. On the one hand the official implementation in formal curriculum through the department of education and on the other hand the introduction of the programs to teachers on schools in coastal villages.

3.4 SPECIFIC ACTIVITIES

In this section some of the activities mentioned in section 3.3 are worked out in more detail. The activity focused on in this section is the development of television programs for both the “Lautku, Cintaku” and “Karya Kita” series.

The “Lautku, Cintaku” series is what one can call a popular nature series, while “Karya Kita” has a more scientific background. Therefore the subjects for both programs should be different. In this section two possible subjects for the “Lautku, Cintaku” and one for the “Karya Kita” program are worked out in more detail.

Lautku, Cintaku

Possible subjects for the “Lautku, Cintaku” series are:

* Sea turtles. In Blongko people do eat turtle meat on special occasions. Apart from that, being able to eat turtle meat is a kind of status symbol. However, the people in Blongko find it more and more difficult to catch sea turtles because of the declining number of turtles still living in the wild. The social-cultural importance of sea turtles for the people of Blongko can be a reason to preserve the sea turtles. When sea turtles can be preserved they still can eat turtle meat on special occasions. When the turtles are hunted overwhelmingly the turtles will become extinct meaning that the people from Blongko cannot eat turtle meat anymore.

The social factor described above can be combined with explanation of the life history of turtles. Attention can be paid to regeneration of turtles, possible extinction and finite nature of natural resources.

Sea turtles are particularly suitable for a program such as Lautku, Cintaku because it is loved by the majority of people.

When both social and natural aspects can be integrated in the program this program might be suitable for other educational activities as well.

* Dugong. The dugong is valued differently in the villages of North Sulawesi. In Blongko the dugong is highly respected by the people. They consider the dugong to be a herald of a lot of fish coming up. Therefore the Blongko people protect the dugong. In villages like Rap Rap, Bajo and Tumbak the dugong is valued for a completely different reason. The villagers love to eat dugong meat. Thus a dugong swimming in the vicinity of those villages better be careful. These two contradictory views of dugong can be used as basis of a program on dugong in which the different attitudes towards dugong can be outlined. The social aspect mentioned above can be combined with more information on the life of dugong, such as regeneration, habitat, threats and the limitation of natural resources. As with sea turtles, dugong are suitable for a program such as Lautku, Cintaku.

When both social and natural aspects can be integrated in the program this program might be suitable for other educational activities as well.

Karya Kita

A possible subject for the Karya Kita series is:

* Manta tow reef survey. This program could start with some information on the decline in coral reef quality and quantity. To stop this decline in quality and quantity of coral reefs it is necessary that coastal areas are managed sustainably. In this management local communities play an important role. They are the people using the coastal ecosystems and relying on them, so they should also be given the responsibility and opportunity to participate in the management of the resources.

One thing that is important in participatory coastal management is reef monitoring. This reef monitoring can be discussed in more detail in the program. Attention should be paid to why the survey is done, how it is done and what will the results be used for. This is the more scientific part of the program. For this explanation can be used shots of a manta tow training carried out by Proyek Pesisir at one of the field sites.

It is recommended to try to make these programs be high quality television. Therefore it is necessary that the concept of the programs is well thought of and that shooting the program is done professionally. To do so, it might be necessary to contract a script writer and/or a director who can take care of the production of the program. These high quality programs might also be used for nationwide broadcasting.

Besides the professionally shot and well thought of programs Proyek Pesisir can be involved in other episodes of both television series as well. It would be wise if Proyek Pesisir thought of a list of potential subjects for the programs. In case TVRI asks for possible subject Proyek Pesisir can provide them with some suggestions right away. Suggested topics include:

- * The discovery of Ceolocanth in Bunaken National Park;
- * Community based marine sanctuaries;
- * ecotourism in Talise;
- * beach cleanup and plastic problem;
- * COTs cleanup;
- * coral reef ecology and impacts of destructive actions such as coral mining and bomb fishing.

3.5 RECOMMENDATIONS

* For education at the regional level in the long run it would be good if Proyek Pesisir equipped an educational boat. The great advantage of having a boat is its mobility. In this way Proyek Pesisir can go to the people instead of letting people come to Proyek Pesisir.

This boat should have a full range of materials on board, such as snorkling gear, glass bottomed buckets (or a glass bottom boat) so that you can take people out into the field, written materials, educational packages, information boards or posters and other materials necessary in educational programs. Besides the materials the boat should have an educational crew, which can do educational programs for schools and other groups. The boat can also be used for special events and field trips.

* In the Manado office there should be someone who takes care of the educational activities on regional level. So, this person takes care of the information boards in the office, participates in the development of written materials, coordinates development of exhibitions and formal curriculum materials, keeps the press informed and takes care of the communication between the Manado office and the publication section in Bogor. This function will be discussed in more detail in section 6.

4.0 EDUCATION STRATEGIES AT THE FIELD SITE LEVEL

4.1 BLONGKO

4.1.1 Introduction

In Blongko the extension officer has already organized some environmental education activities over the last year. Besides a lot of informal talks with the local community some examples of educational activities already carried out are the manta tow reef monitoring training, which included a program on coral reef ecosystems, informative meetings on the establishment of a marine sanctuary, starting with the establishment of an information center and the foundation of a community based environmental education group. So far, the education group has not had any educational activities yet.

In the coming year the cautious steps already taken during the last year must be followed by another step forward. Therefore an educational strategy is necessary.

The main activities going on in Blongko at the moment are the development of a marine sanctuary, the building of an information center and the building of sanitary units (MCK) in the village. These issues should be the focal point of the education strategy as well. Besides these three main activities attention will be paid also to incorporate coastal issues in the formal curriculum of the elementary school (SD) of Blongko.

4.1.2 Objectives and strategies

The main goals of educational activities in Blongko will be:

1. Provide the local community with accurate information on marine sanctuaries so that the development of the marine sanctuary can become a success. The community in Blongko does not yet have experience with the establishment of marine sanctuaries. They probably have a lack of information concerning marine sanctuaries. However, the people have to be well-informed on the way a marine sanctuary works and what the consequences of establishing a marine sanctuary are. Besides infor-

mation on marine sanctuaries it is worthwhile to provide the people with education on coastal ecosystems, so that they can value the importance of the marine sanctuary.

Another major task of education concerning the marine sanctuary will be to keep the people informed about the process in the marine sanctuary. People will pay more attention to something when they have more information on it. Especially when there are obvious improvements (fish abundance, coral cover, etcetera) these should be communicated to the people. Education plays an important role in this.

2. Integration of coastal resources issues into formal curriculum of the elementary school (SD) of Blongko. Children are the leaders of the future. Therefore it is important that they have insights into coastal issues. When they start learning about the importance of coastal ecosystems, its assets and the threats upon it when still young, they can become good tenants of coastal ecosystems for the future. There is no better place to learn about coastal issues than coastal areas itself. When children can learn about features happening in their own backyard, they recognize their own interrelationship with the issue, which makes the message stronger. Children learning about their own environment can lead to appreciation of that environment, which eventually can lead to environmental conscious people who behave accordingly.

The integration of coastal issues into the formal curriculum obviously is a long term strategy. To develop good curriculum takes a lot of efforts and time, but it is worth it. Integration of coastal issues will be done through the “Muatan Lokal” curriculum. Blongko will be the pilot project for the implementation in elementary schools. When the results in Blongko are satisfactory attempts can be made to expand the programs to schools other than the school in Blongko.

3. Set up the information center, design and work out exhibitions of the center. The information center plays an important role in the provision of information to the population of Blongko. For the continuation and success of Proyek Pesisir it is important that the local people are kept well informed on the activities of Proyek Pesisir and the major coastal issues appearing in Blongko. The information center can play an important role in the provision of this information. Besides information on project activities and coastal issues it might be necessary to give information on certain subjects that are not yet well understood by (part of) the community. Again, the information center is a good means to provide this information.

The information in the information center will be mainly provided through information boards. However, besides the information boards some interactive materials should be developed. Especially for children it is important that they are invited to do or touch something while learning.

The exhibitions in the information center must be focused on specific, topical issues. It should be remembered that too much information about too great a variety of subjects will be counter productive. The information center, thus should provide information on a limited amount of subjects. The exhibitions should be kept up-to-date and changed periodically.

4.1.3 Approaches and methods

Each of the three goals and objectives mentioned in section 4.1.2 request a different approach and a different set of methods. The approaches for each of them will be discussed in this section.

1. Provide the local community with accurate information on marine sanctuaries so that the development of the marine sanctuary can become a success.

The methods used to provide the community with information depends on which information is required. Considering the sort information needed the most suitable method can be chosen. Besides informal talks with members of the community three important methods to provide information are:

- * Information center. In the information center a permanent exhibition on the marine sanctuary and subjects related to the marine sanctuary can be built. Part of the space in the information center can be used to give information on the process in the marine sanctuary. The particular information given in the information center depends on the process in the marine sanctuary and the particular needs of the community. The information center will be discussed in more detail under point 3 in this section.

- * Informative meetings with the community. These meetings should take place on a regular basis. The purpose is to inform the people about the process in the marine sanctuary. Part of the local community will be closely involved in the marine sanctuary, but this is probably not the case for all people in Blongko. It is important that these people are kept informed too. One way of doing so is through the information center, but not all people will have a look at the information in the information center. They might be reached through informative meetings. These meetings can also be used to give additional education on coastal ecosystems. When it appears that there exists lack of knowledge on ecosystems or that there are some misconceptions these subjects can be addressed in informative meetings.

Sometimes it might be necessary to invite somebody from outside the community or Proyek Pesisir to provide the information needed by the community in an informative meeting.

- * Comparative study of other marine sanctuaries. Sometimes it can be very helpful to learn from experiences of other people. There is no use in reinventing the wheel. Therefore it is good to keep in contact with other communities who have experiences with marine sanctuaries. These can be communities in other field sites of Proyek Pesisir, but also from communities not related to Proyek Pesisir (such as the Philippines).

The activities can be either field trips to other marine sanctuaries, inviting people from other marine sanctuaries over to Blongko to be able to share experiences or contact through mail or e-mail. These contacts can provide new insights into marine sanctuaries or can help solving problems occurring in Blongko.

2. Integration of coastal resources issues into formal curriculum of the elementary school (SD) of Blongko.

The elementary school in Blongko has the possibility to implement coastal issues in the formal curriculum through Muatan Lokal. Every class has 2 school hours (80 minutes) every week for Muatan Lokal. Muatan Lokal is especially reserved for local components. Local coastal issues can be perfectly integrated in Muatan Lokal.

Teachers of the school are very interested in integrating coastal issues in the formal curriculum, but they do not have a background in coastal ecology. They have no idea how they can teach coastal issues. Therefore it is necessary that teachers get training in teaching coastal issues. This training should comprise a lot of background information on coastal issues.

Besides training of teachers both the curriculum and materials must be developed. In development of curriculum and materials Proyek Pesisir should play an important role. Once curriculum and materials are developed they can be tested in the school. Testing should be done by teachers in cooperation with Proyek Pesisir and the community based education group. Proyek Pesisir and the education group should assist the teachers in conducting the coastal education programs.

The subject of the lessons should be based on ecological basics. The ecological basics must be visualized with local examples. The local surroundings provide a perfect opportunity for the chil-

dren to link up knowledge on ecological basics with everyday experiences in the village. This implies the programs must be very practical. The schoolchildren should learn out in the field. The integration of coastal issues in formal curriculum will be discussed in more detail in section 4.1.4.

3. Set up the information center, design and work out exhibitions of the center.

The information center should provide information on Proyek Pesisir (what is the project about, what are the goals, what are the activities) and on important coastal issues in Blongko.

The space in the information center should be divided in several sections. Each section should be used to provide information on a certain topic. It is important, especially because space in the information center is limited, that the number of sections is limited too. There must be one section on Proyek Pesisir, one section focusing on schoolchildren, and then about two other sections on important coastal issues in Blongko. These issues can, for instance, be the marine sanctuary and protection of the watershed. The section focusing on children can be arranged in two different ways, either a special corner in the center or the information for children put under the information focusing on adults.

The topic of the exhibitions for children must be tuned to the contents of the Muatan Lokal curriculum. When the schools are working on mangrove ecosystems, the information center should have an exhibition on mangrove ecosystems. For all the exhibitions it is important that they provide accurate and actual information. Another condition, especially important for the exhibition for children, is the interactive character of the exhibitions. The exhibitions thus should be a combination of information boards and more interactive methods. Examples of interactive materials are puzzles and question sheets.

Another way of making the information center more interactive is giving people the chance to participate in the development of exhibitions. A group that should be heavily involved in the development of the information center is the environmental education group. They should be given the responsibility for the information center. Furthermore, other groups of the community, such as fishermen groups or farmer groups, should be invited to participate in the development of exhibitions. Schoolchildren should be given the possibility as well. For instance, sixth grade can design an exhibition focusing on other children in lower grades. This exhibition can be one of the outputs of the Muatan Lokal program in sixth grade. Another method to provide information in the information center is the availability of books in a small library. People interested in a certain topic then can come to the information center to look for information in the books available in the library.

4.1.4 Specific activities

In this section some of the activities mentioned in section 4.1.3 are worked out in more detail. The activities focused on in this section are the integration of coastal issues into the formal curriculum of the elementary school and the design of exhibitions for the information center.

Integration of coastal issues into formal curriculum

The elementary school of Blongko has, just like all schools, the possibility to integrate local components in the formal curriculum through Muatan Lokal. Among these local components can be education on coastal issues. The department of education has developed an outline for contents to be taught in the coastal component of the Muatan Lokal. However, teachers do not know how they can incorporate these subjects in their classes, although they are interested in doing so. Therefore the teachers are interested in working together with Proyek Pesisir in trying to imple-

ment coastal issues in their school.

Proyek Pesisir should provide the teachers with enough background information and materials that can be used. The teachers probably need training in coastal issues, so that they will become capable of teaching that subject matter to their classes.

Since Blongko is situated on the coast it provides the school with a great opportunity to learn about coastal ecosystems through first hand experiences. The children get a perfect opportunity to link the knowledge taught in the classroom with experiences in the field. Therefore it is necessary to make the school programs experience focused, meaning that the children spend a great deal of time learning outside the classroom.

Learning out in the field, however, requires more people who can accompany the children. The class should be split up in small groups. It cannot be expected from teachers that they cut themselves in pieces. That is why extra support is necessary. When going into the field the teachers should be assisted by other people. These can be parents or, even better, people from the education group. However, before being able to accompany groups of children doing fieldwork requires special skills. Therefore these people should be trained in working with groups of schoolchildren. Both the training of teachers and other people helping in the education programs should be taken care of by Proyek Pesisir.

The programs on coastal issues should be as interactive, active and practice based as possible. Children must spend a lot of time outside the classroom, doing things and finding answers to basic question themselves. The materials that can be used for such programs needs to be interactive too. A good way of interactive learning is by using worksheets. Following a short explanation on a certain subject, children can be provided with a worksheet on that topic. With the help of the general knowledge they were taught in class and other information sources (natural environment, information center, people in the community) the children should be able to do the assignments on the work sheets. In Appendix II, important aspects in making worksheets are listed. A second possibility is to assign a class to make an exhibition for the information center on a certain topic. A third possibility is doing experiments in the field. These can be chemical, biological of physical experiments.

The educational materials should be developed by Proyek Pesisir or by some organization contracted by Proyek Pesisir, because the school teachers in Blongko are not able to develop the materials because of lack of topical background, time and means. However, the development of the curriculum and materials should be done in close cooperation with the school teachers. Regular meetings, testing and evaluation will be necessary. This cooperation can prevent a situation in which the developed curriculum and materials are not being used, because they do not meet the standards of the teachers.

The coastal ecology curriculum developed by the department of education is not considered suitable for the elementary school in Blongko. The teachers do not know how to handle the subjects. Therefore a new, better adjusted, curriculum should be developed. This curriculum should be developed for every class of the elementary school, starting with first grade and finishing with sixth grade. Every class should basically get the same subjects taught, but more detailed the higher the grade gets.

Central point in this curriculum for all grades should be coastal ecosystems in general. Children need to know the basics of ecosystems before they can understand what is happening in their own surrounding. The first trimester in every grade should be spent on general background information on

coastal ecosystems. Second and third trimester can be focused on a special ecosystem (e.g. mangrove forest, coral reefs, sea grass). These specific ecosystems can be discussed in more detail. Material on all specific coastal ecosystems present in Blongko should be developed on all grade levels. Each teacher then can choose which specific ecosystem will be central in the program. Every teacher can pick an ecosystem for the second trimester and one for third trimester.

The program for every grade thus should be built along the following structure:

First trimester

General knowledge on coastal ecosystems.

Important aspects that should be addressed are:

- * Energy flow in ecosystems (food chains)
- * Cycles (limitedness of ecosystems)
- * Interaction between organisms
- * Change (evolution, adjustment to the environment (e.g. camouflage))

Second trimester

More detailed attendance of one specific ecosystem

Examples are:

- * Coral reefs
- * Mangrove forests
- * Sea grass ecosystems

Third trimester

More detailed attendance of one specific ecosystem (a different ecosystem than the one addressed in the second trimester)

In all education on ecosystems at all levels, attention should be paid to the role humanity plays in it. This must both be in what way people use the specific ecosystems and what the effects of human activities on the ecosystem are. Especially in higher grades this should be an important topic. Children must realize that humans are part of the ecosystems, just as fish and trees are.

When the curriculum has proven to be working fine in Blongko attempts can be made to expand it to other villages. Therefore it is important to get the department of education involved in the program. A good way of getting them involved is by inviting them over to Blongko to participate in one of the programs, so that they can see for themselves how good the curriculum is. When they get positive information on the curriculum on a regular basis, this may be a stimulation for them to implement the developed curriculum in other villages as well. Besides getting the department of education involved an outreach program to schools in other villages should be started when the program is running smoothly in Blongko. The implementation of coastal issues in formal curriculum at the regional level is also discussed in section 3.

Exhibitions in the information center

Important aspects of the exhibitions in the information center have already been discussed in section 4.1.3. The exact outline of the exhibitions is dependent on the topics discussed. In this section a rough layout for the information center is drawn, together with an explanation on the layout. Besides the layout of the information center, information on important aspects in designing an exhibition is provided for in Appendix I. A sketch of the layout of the information center is included in Appendix III.

The outside wall of the information center will almost totally be windows. This has two important impacts on the center. The first impact is that an abundance of light can enter the center during daytime. Light is extremely important to an exhibition. An exhibition should be visible to people. Therefore it is good that sunlight can enter the room. The second impact of all the windows is that most of the outside walls cannot be used for displays. So, other means should be used to provide space for displays. Another factor that has to be taken into account are weather conditions. Because the space is open, the exhibits will be subject to weather conditions, such as rain, wind and sunlight. The materials used for the exhibits should be able to stand weather influences. Photos and other display materials should be laminated when possible.

As stated in section 4.1.3 the information center should be divided in sections. This can be accomplished by putting a movable information board perpendicular to the wall. Putting the board this way has two major advantages. The first is that it divides the room into two sections. The board provides a physical boundary between sections. The second major advantage is the fact that both sides of the board can be used for displays.

On each side of the board a major coastal issue in Blongko can be treated. However, information boards cannot be used to put down materials other than photos, drawings, text, etceteras. To be able to display materials other than can be put on an information board (e.g. shells, fishing materials) a shelf can be constructed below the windows. For even more space a cupboard could be constructed instead of a shelf. The wall between the exposition room and the office can be used to provide information on *Proyek Pesisir*. The wall facing the sea can be used for exhibitions focusing on schoolchildren. Because this wall is all windows, the only space that can be used is the wall below the windows. Schoolchildren are relatively short and they do not mind to sit down on the floor, so their exhibits can be on a lower height.

Either in the office or in the cupboards under the windows in the exhibition room a miniature library can be organized. The books should be easy accessible, but not be lent out. People can read these books in the information center, but cannot bring them home with them. The furniture described above should be completed with several benches, that can be used to sit down for a while, read a book or when having a meeting.

4.1.5 Recommendations

* For the development of curriculum for coastal issues it is important that there is a good cooperation between the ones developing the curriculum and materials (*Proyek Pesisir*) and the ones having to implement it (teachers). The rough outline must be drawn by the developers and implementers together. The development team should not start developing right away. Furthermore it is recommended not to develop all materials at the same time. Start with materials on one topic, then test it in practice, evaluate, readjust, try again, until a good concept is found. Only then start producing materials on other topics.

* In the development of curriculum Blongko and Bentenan should work together. In both villages curriculum will be developed. Although on different levels, cooperation between both villages is welcome.

* The actual development of curriculum and materials can be contracted out. However, when choosing for contracting it out, the process should be carefully monitored by *Proyek Pesisir*. Meetings to discuss and evaluate the developed materials must be planned on a regular and frequent basis. Coordination of the process will be a task of the education officer of *Proyek Pesisir* (see section 6).

* Development of formal curriculum takes a long time. However, before the curriculum is ready to be implemented in the school Proyek Pesisir can provide incidental programs on coastal issues for the schools. At the moment the time available for Muatan Lokal is not used, so why not use it to teach about ecosystems on an ad hoc basis until a more formal curriculum is prepared.

* Use the schoolyard as a place where additional information (besides information center) can be provided. The covered walkway between the two buildings can be used to put up an information board. The information can be provided either by the schoolchildren, teachers, education group or Proyek Pesisir.

* Use sanitary units (MCK) to give information on sanitation and responsible use of water sources. The doors of the MCKs can be used to put up this information.

* Electrification of the information center must be considered. It is recommended to provide the information center with electricity, so that the center can be used in the evening too, either as information center or as meeting place. The sort of lighting must be considered.

4.2 BENTENAN AND TUMBAK

4.2.1 Introduction

Bentenan and Tumbak is a special field site because it consists of two villages. The two villages have to deal with partly different issues, needing different approaches. The educational needs in Bentenan are different from those needed in Tumbak. Therefore Bentenan and Tumbak will be approached individually.

The main coastal issues in Bentenan are erosion of the beach in front of the village, garbage thrown into the rivers which eventually flows into the sea. Erosion is probably enhanced by coral mining. The coral reef protects the beach from being eroded. When the coral reef is degraded through coral mining this protection will diminish. Another minor issue in Bentenan is the use of destructive fishing methods. Still one family is using explosives to catch fish. Another family still uses poisons to catch aquarium fish. It is called a minor issue because only two families use these destructive methods, but still, it would be better when these methods were abandoned completely.

So far, educational activities on these issues have been limited. The extension officer has carried out some educational programs, but the activities are not yet structured in a more overall strategy. Besides the incidental educational activities carried out in the past, the major developments from educational point of view are the plans to build an information center, to develop an information board near the marketplace and to incorporate coastal issues in the formal curriculum of the local junior high school (SMP). The main educational activities in the coming year will be the foundation and development of an information center, development of information boards and the integration of coastal issues in formal curriculum. The important coastal issues in Bentenan should be addressed in these activities. Another activity that must be continued in both Bentenan and Tumbak is monitoring COTs outbreaks and cleanup actions combined with education on coral reef ecosystems and hazards upon it. COTs monitoring and cleanups have already been carried out and should be continued whenever necessary.

Bomb fishing in Bentenan is an activity carried out by only one family, however, in Tumbak use of explosives is still widespread. Although people in Tumbak probably know the negative effects on the coral reef of using explosives in fishery they still use it in abundance. Another activity of Tumbak

people degrading the coral reef is coral mining. However, coral mining has decreased over time. Nowadays coral mining only exists to supply coral for personal use, while in former days coral was gathered for trade purposes as well. A third major issue in Tumbak is the limited availability of clean water for drinking.

As in Bentenan structural educational activities have been minimal. Some educational programs on coral reef ecosystems have been carried out. Furthermore informal talks on coastal issues have often occurred. For Tumbak it is important to get structural education activities started in which the main coastal issues will be addressed.

4.2.2 Objectives and strategies

Bentenan

The main goals of educational activities in Bentenan will be:

1. Integration of coastal resources issues into formal curriculum of the junior high school (SMP) in Bentenan. Children are the leaders of the future. Therefore it is important that they have insight in coastal issues. When they start learning about the importance of coastal ecosystems, its assets and the threads upon it when still young, they can become good tenants of coastal ecosystems for the future. There is no better place to learn about coastal issues than coastal areas itself. When children can learn about features happening in their own backyard, they recognize their own interrelationship with the issue, which makes the message stronger. Children learning about their own environment can lead to appreciation of that environment, which eventually can lead to environmental conscious people who behave accordingly.

The integration of coastal issues into the formal curriculum obviously is a long term strategy. To develop good curriculum takes a lot of efforts and time, but it is worth it. Integration of coastal issues will be done through the Muatan Lokal curriculum. Bentenan will be the pilot project for the implementation in junior high schools (SMP). When the results in Bentenan are satisfactory, attempts can be made to expand the programs to schools other than the school in Bentenan.

2. Increasing the knowledge on the mutual interrelationship between human activities such as waste disposal upland and the condition and benefits of coastal ecosystems. To a great number of people it is not always clear what impact their behavior has on the world they live in. Especially when the effects of human behavior are not seen at the own backdoor, but further away, these interrelationships might not be clear. Such an example occurs in Bentenan. People living more upland might not have adequate information on what the effect of their behavior (waste disposal) is on coral reefs. And what impact the degradation of the coral reefs has on their own life again. Providing the community with accurate information on their interrelationship with the coastal ecosystem, can contribute to a situation in which they dispose their waste with more care.

3. Stimulating the community to put social pressure on the two families using destructive fishing methods by providing with backup (both informative and institutional). The majority of the people in Bentenan has abandoned destructive fishing methods because they realize that these methods can result in a heavily degraded coastal ecosystem. However, this knowledge is not sufficient to keep the last two families from using destructive methods. They have their own reasons to continue. When only a minority of the people behaves differently from the rest of the community, social pressure can be a good means to persuade them to stop their different behavior and adapt to the rest of the community.

Social pressure can be stimulated through education. Education in this plays the role of emphasizing over and over again the destructive effect of explosives and poisons on coastal ecosystems and the setback for the community caused by this degradation. It should be emphasized that destructive behavior of one individual ruins the system for the whole community. When the community is confronted with this message regularly they might put pressure on the dissidents. Another effect might be that the dissident feel embarrassed and stop their destructive behavior.

4. Increasing the knowledge on the relationship between human activities and erosion and ways to prevent erosion from happening. People in Bentenan are confronted with erosion of the beach in front of the village, but they do not know how they can prevent this erosion. They say that they have no influence on it.

It may be true that the people in Bentenan have no influence on the erosion caused by the sea, but human behavior has impact on erosion by the sea. Coral reefs protect beaches against erosion, but when coral reefs are degraded through coral mining or bomb fishing, they provide less protection against erosion.

Besides shoreline erosion another problem is probably caused by water run off from the mainland. This can cause sedimentation on coral reefs resulting in suffocation of the coral. This can be caused by human activities such as cutting down vegetation and agriculture. Education can help the people understand what they can do to prevent erosion and sedimentation and how to deal with existing erosion and sedimentation problems (e.g. where to build houses and other constructions). When people have insight in the erosion problem and ways to prevent these problems they can act accordingly.

5. Set up the information center, design and work out exhibitions of the center. The information center plays an important role in the provision of information to the population of Bentenan. For the continuation and success of Proyek Pesisir it is important that the local people are kept well informed on the activities of Proyek Pesisir and the major coastal issues appearing in Bentenan. The information center can play an important role in the provision of this information. Besides information on project activities and coastal issues it might be necessary to give information on certain subjects that are not yet well understood by (part of) the community. Again, the information center is a good means to provide this information.

The information in the information center will be mainly provided through information boards. However, besides the information boards some interactive materials should be developed. Especially for children it is important that they are invited to do or touch something while learning. The exhibitions in the information center must be focused on specific, topical issues. It should be remembered that too much information about too great a variety of subjects will be counter productive. The information center, thus should provide information on a limited amount of subjects. The exhibitions should be kept up-to-date.

6. Set up a newsletter

This newsletter can play an important role in the provision of information to the population of Bentenan. It is important that the local people are kept informed on the activities of Proyek Pesisir and major coastal issues in Bentenan. Besides the information center a newsletter can play an important role in providing this information. The newsletter can be published every month or once every two months.

Tumbak

The main goals of educational activities in Tumbak will be:

1. Increasing knowledge on the results of destructive fishing methods, both for the ecosystem and the people and providing alternatives for destructive fishing methods. Despite efforts of Proyek Pesisir to abandon destructive fishing methods still a great number of people in Tumbak use explosives to catch fish. This is probably partly caused by lack of understanding of the full impact it has on the ecosystem and themselves. To tackle this problem Proyek Pesisir should carry out educational programs to explain to the people these negative impacts of bomb fishing. In these programs the importance of a healthy coastal ecosystem should be emphasized. In addition to this understanding of ecosystems people should be provided with alternatives for their current, destructive behavior. Education alone will probably be insufficient to end bomb fishing. This can be done by providing alternative fishing gear in combination with educational activities. These educational activities can include instruction on how to use this gear (if necessary) and explanation of the reasons why this alternative fishing method is better for the sustainability of the ecosystem.

2. Increasing knowledge on the results of coral mining, both for the ecosystem and the people and providing alternatives. To tackle the problem of coral mining a strategy similar to the one for destructive fishing methods is necessary. Actually, both destructive fishing methods and coral mining can be addressed in the same educational activities. In educational activities the importance of a healthy coastal ecosystem should be emphasized. Furthermore, alternatives for coral mining should be thought of, either by Proyek Pesisir or in the community, and introduced to the community. One probability is that several truckloads of land based rock be transported and dumped in an unused area of the village. People can use these rocks instead of coral. While Proyek Pesisir can pay for the first stockpile, rocks should be sold at a low cost. Money saved out can be used to replace rocks when the pile runs down.

3. Increasing knowledge on health issues and the interrelationship between human activities and the health situation in the community. This should eventually lead to the building and use of sanitary units (MCK). Nowadays a majority of the people in Tumbak urinate and defecate in the ocean instead of at the toilet. This habit, in combination with the limited availability of clean drinking water can cause health problems. Where the limited availability of clean water needs a mere technical solution, education can play an important role in solving the other part of the problem. People in Tumbak should learn that relieving one self in the ocean has effects on the health situation. Something thrown into the ocean does not disappear, although it might seem that way. Education should focus on this aspect of interrelationship and try to stimulate the people to build and use MCKs instead of the ocean. Furthermore, education can focus on responsible water use. Water used for washing clothes, dishes or one self is not suitable for drinking purposes anymore.

4. Provide the local community with accurate information on marine sanctuaries so that the development of the marine sanctuary can become a success. The community in Tumbak has not yet have experience with the establishment of marine sanctuaries. They will probably have a lack of information considering marine sanctuaries. However, the people have to be well-informed on the way a marine sanctuary works and what the consequences of establishing a marine sanctuary are. Besides information on marine sanctuaries it is worthwhile to provide the people with education on coastal ecosystems, so that they can value the importance of the marine sanctuary.

Another major task of education concerning the marine sanctuary will be to keep the people informed about the process in the marine sanctuary. People will pay more attention to something when they have more information on it. Especially when there are obvious improvements (increase in fish abundance, improved coral cover) these should be communicated to the people. Education plays an important role in this.

5. Set up a small information center in the office of the Kepala Desa. Unlike the other villages, Tumbak does not have concrete plans to establish an information center. However, an information center can play an important role in providing information to the local community. Therefore it would be wise to arrange some exhibits in the office of the kepala desa.

The information center in the office of the kepala desa plays an important role in the provision of information to the population of Tumbak. For the continuation and success of Proyek Pesisir it is important that the local people are kept well informed on the activities of Proyek Pesisir and the major coastal issues appearing in Tumbak. The small information center can play an important role in the provision of this information. Besides information on project activities and coastal issues it might be necessary to give information on certain subjects that are not yet well understood by (part of) the community. Again, the information center is a good means to provide this information.

4.2.3 Approaches and methods

Each of the goals and objectives mentioned in section 4.2.2 request a different approach and a different set of methods. The approaches for each of them will be discussed in this section.

Bentenan

1. Integration of coastal resources issues into formal curriculum of the junior high school (SMP) in Bentenan.

The junior high school in Bentenan has the possibility to implement coastal issues in the formal curriculum through Muatan Lokal. Every class has 2 school hours (80 minutes) every week for Muatan Lokal. Muatan Lokal is especially reserved for local components. Local coastal issues can be perfectly integrated in Muatan Lokal.

Teachers of the school are very interested in integrating coastal issues in the formal curriculum, but they do not have a background in coastal ecology. They have no idea how they can teach coastal issues. Therefore it is necessary that teachers get training in teaching coastal issues. This training should comprise a lot of background information on coastal issues. Besides training of teachers, both the curriculum and materials must be developed. In development of curriculum and materials, Proyek Pesisir should play an important role.

Once curriculum and materials are developed they can be tested in the school. Testing should be done by teachers in cooperation with Proyek Pesisir. Proyek Pesisir and other members of the community (e.g. parents) should assist the teachers in conducting the coastal education programs. The subject of the lessons should be based on ecological basics. The ecological basics must be visualized with local examples. The local surroundings provide a perfect opportunity for the children to link up knowledge on ecological basics with everyday experiences in the village. This implies the programs must be very practical. The schoolchildren should learn out in the field. The integration of coastal issues in formal curriculum will be discussed in more detail in section 4.2.4.

2. Increasing the knowledge on the mutual interrelationship between human activities such as waste disposal upland and the condition and benefits of coastal ecosystems.

The underlying problem of these issues probably is that people living upland do not realize what damage their waste can cause in coastal ecosystems such as coral reefs and how that effects their lives again (e.g. increasing fish prices because fishermen are confronted with lesser fish). Thus, it is necessary to explain this interrelationship to the people. This should not be done by using only one method, but rather a combination of several methods. The methods to be used are:

* Informative meetings with the community. In these meetings the interrelationships between actors in ecosystems and the fact that garbage does not leave the system should be the central focal points of these meetings. In short: When people throw garbage in the river, it will flow to the ocean where it causes degradation of the coral reefs, which leads to lesser fish, obliging the fishermen to fish further offshore resulting in higher priced fish. In these meetings attention also has to be paid to alternative ways to dispose garbage, or even better, ways to re-use or recycle part of the garbage.

Because every single person produces garbage the informative meetings should focus on the whole community. However, it is not wise to do one big meeting for all the people in the village. It is better to try to divide the community in better specified target groups, such as housewives, farmers, fishermen and children. It is important that both coastal and more inland communities are targeted.

* Clean up activities. In Bentenan people clean up the village every Friday. This clean up can be used to gather all garbage found in the village. This garbage can be weighed or measured. When this is done on a regular basis (weekly or monthly) villagers can see if there is a rise in number of garbage or a decline. This information can be used as input for the informative meetings again.

* Information center. In the information center an exhibit on garbage problems can be built. In this exhibitions attention can be paid to, for instance, the time it takes nature to digest different sorts of garbage (e.g. plastic, paper, glass, metal). Furthermore, in the exhibits the interrelationship between waste disposal and coastal ecosystem conditions should be paid attention to. Furthermore, information on results of the cleanups can be displayed in the information center (e.g. trends in volume or weight of garbage).

3. Stimulating the community to put social pressure on the two families using destructive fishing methods by providing with backup (both informative and institutional).

This should not be done through special educational programs focusing on this particular issue. However, it is wise to refer to the destructiveness of these fishing methods whenever possible. When, for instance in programs on the negative effect of garbage on coral reefs a comment can be made on other destructive habits as well.

Furthermore, destructive fishing methods can be addressed in informal discussions on coastal issues, both with the families using the destructive methods and the rest of the community. When it appears that misconceptions exist on the relationship between human activities and the coastal ecosystem the extension officer can decide on doing organized educational activities (e.g. presentations, informative meetings). It should always be remembered that *Proyek Pesisir* must not exclude the two families from *Proyek Pesisir* activities and should make efforts to involve them whenever possible.

4. Increasing the knowledge on the relationship between human activities and erosion and ways to prevent erosion from happening.

The issue of erosion of the beach in front of the village can be addressed in different educational activities. One activity that is always important are informal talks with members of the community. However, this is an activity that is non-structured and can take place at every time of the day. Besides informal talks several structured educational activities can be carried out. The two main structured activities should be:

* Exhibits in the information center. In the information center an exhibit on erosion problems should be built. In this exhibit attention can be paid to causes of erosion, consequences for the community and possible actions to be taken to prevent erosion or reduce the negative effects. For the exhibits, results of beach profile monitoring can be used. The information center will be discussed in more detail below and in section 4.2.4.

* Informative meetings with the community. The community thinks that they do not have any influence on erosion of the beach in front of the village. Partially this might be true, but partially erosion is caused by human activities in the village and one thing the community can do is anticipate to the current erosion (e.g. by not building houses in places vulnerable to erosion). These possible human actions that can be taken to prevent erosion from happening or having negative effects should be the main focus in the educational programs.

It might be necessary to invite an erosion specialist (e.g. local consultants such as Pierre Gosal or Febrina Sumanti) to help with these programs. An erosion specialist can, for instance, be invited to do part of the educational program, give a presentation on erosion issues or can give background information that can be of use to the extension officer.

5. Set up the information center, design and work out exhibitions of the center.

The information center should provide information on Proyek Pesisir (what is the project about, what are the goals, what are the activities) and on important coastal issues in Bentenan.

The space in the information center should be divided in several sections. Each section should be used to provide information on a certain topic. It is important, especially because space in the information center is limited, that the number of sections is limited too. There must be one section on Proyek Pesisir, one section focusing on schoolchildren, and then about two other sections on important coastal issues in Bentenan. These issues can, for instance, be erosion and garbage disposal. The section focusing on children can be arranged in two different ways, either a special corner in the center or the information for children put under the information focusing on adults.

The topic of the exhibitions for children must be tuned to the contents of the Muatan Lokal curriculum. When the schools are working on mangrove ecosystems, the information center should have an exhibition on mangrove ecosystems.

For all the exhibitions it is important that they provide accurate and actual information. Another condition, especially important for the exhibition for children, is the interactive character of the exhibitions. The exhibitions thus should be a combination of information boards and more interactive methods. Examples of interactive materials are puzzles and question sheets.

Another way of making the information center more interactive is giving people the chance to participate in the development of exhibitions. Already existing groups in the community, such as fishermen groups or farmer groups, should be invited to participate in the development of exhibitions. Schoolchildren should be given the possibility as well. For instance, children in junior high school can design an exhibition focusing on other children in lower grades. This exhibition can be one of the outputs of the Muatan Lokal program in junior high school.

Another method to provide information in the information center is the availability of books in a small library. People interested in a certain topic then can come to the information center to look for information in the books available in the library. The information center will be discussed in more detail in section 4.2.4.

6. Set up a newsletter

The newsletter should provide information on Proyek Pesisir (what is the project about, what are the goals, what are the activities) and on important coastal issues in Bentenan. The newsletter can be made of a folded A4 paper. It can be either made on the computer in the Manado office or it can be handwritten. The newsletter can be distributed to all households in Bentenan.

In the newsletter attention must be paid to actual *Proyek Pesisir* activities and coastal issues in Bentenan. This can be reports of activities carried out during the last month, announcement of activities planned for the coming month and writings on actual coastal issues in Bentenan. The newsletter should not be written by the extension officer only, but local people should be involved in it. Local people can be invited to write a report on activities they took part in (e.g. participants in ICM training in Manado). When people themselves are involved in the development of the newsletter, chances are higher that people will read the newsletter.

It is extremely important that the newsletter is adjusted to the interests and capability of the local population. Therefore, it is important that easy language is used. The newsletter should be easy to read. Besides easy language pictures (e.g. photos, drawings) should be included to make the newsletter more attractive. Another possibility is using continuing stories. Every month a new episode of the story is written. In this story major coastal issues can be addressed in an informal, attractive way.

Tumbak

1. Increasing knowledge on the results of destructive fishing methods, both for the ecosystem and the people and providing alternatives for destructive fishing methods.

An important thing to remember concerning the issue of destructive fishing methods destroying coral reefs is that only telling people not to use destructive fishing methods will not work. In all activities carried out on destructive fishing methods emphasis should be on the relationship between the ecosystem and human behavior. Especially on what a healthy ecosystem means to the people of Tumbak. And that using the same destructive methods, only further away from the village will have the same negative effect as bomb fishing in the direct vicinity of the village, only the effect will be clear on a longer term or may negatively impact their neighbors. Ways to pay attention to destructive fishing methods in Tumbak will be through:

- * Informal talks with community members. In these talks the central point should be on the advantages of a healthy coastal ecosystem for the community. These informal talks should be held with all kinds of people in the village, both people using destructive fishing methods and those who do not use such methods. It is important that people using explosives start realizing that they ruin the ecosystem for the whole community. Maybe this is a reason for them to stop. People not using explosives should be reminded of the importance of a healthy ecosystem, so that they might put pressure on other people to stop destructive fishing. Informal personal talks are especially important, because one-on-one communication can be more persuasive than communication in larger groups.
- * Informative meetings with the community. As in the informal talks emphasis should be on the assets of a healthy ecosystem instead of merely focusing on destructive fishing methods. However, destructive fishing methods should be addressed in these meetings as being a threat to the health of the coastal ecosystem. These meetings must be focused on building awareness among the community of the importance of a healthy ecosystem. Building awareness is a long term process. Therefore it is necessary to keep doing informative meetings on a regular basis over a long period of time.
- * Information in the office of the kepala desa. Information in the office of the kepala desa should be adjusted to the information discussed in the informative meetings. This means that the information in the office of the kepala desa should be kept actual and accurate. Information should again focus on healthy ecosystems so that, possible threads to a healthy ecosystem can be integrated.

In Tumbak education will have only a minor influence in the case of this issue. Education in itself is

a weak means, and especially when the purpose is to change people's behavior. Destructive fishing methods are still too widespread and the people not using destructive methods get a profit of it indirectly through the mosque. People who catch fish by using explosives pay a share to the mosque. Therefore, the community gets a profit from other people using explosives. In Tumbak it might be necessary to think about providing people with alternative fishing gear under the condition that they do not use destructive fishing methods again. However, education can and must play a role in building local knowledge on coastal ecosystems.

2. Increasing knowledge on the results of coral mining, both for the ecosystem and the people and providing alternatives.

This issue needs basically the same strategy as the issue of destructive fishing methods, mentioned above. Coral mining should, as well as destructive fishing methods, be mentioned as one of the threads to a healthy coastal ecosystem. It should be reminded that there should be an alternative given for current, destructive practices, rather than only telling people to stop mining coral.

3. Increasing knowledge on health issues and the interrelationship between human activities and the health situation in the community.

This issue is basically caused by a combination between a lack of information on the effect relieving one self in the ocean can have on health of the local community and a cultural habit of using the ocean rather than a toilet. Education in this should mainly focus on providing information on the interrelationship between human activities and health. Several educational activities that can be used are:

- * Informal talks with the people. In these talks relations between human activities and health issues can be discussed.

- * Informative meetings. These meetings can be done by either the extension officer himself, or a guest can be invited to do a presentation on a certain topic concerning health, such as the health effect of feces and urine in sea water and seafood. Examples of people who can be invited are people from a PUSKESMAS or a hospital, or somebody from Blongko who can explain why the people in Blongko decided to build MCKs. Another subject that should be addressed in these meetings is responsible water use. Since fresh water is not abundantly available in Tumbak people should use it in a responsible way. By responsible is also meant not to collect drinking water at a place where other people take a bath or wash their clothes.

- * Information on health issues in the office of the kepala desa. In the office of the kepala desa some space should be reserved for exhibits on health issues. In these exhibits attention should be paid to human activities causing health problems and how to change this behavior to improve the health situation. Among this information might be information on the advantages of using MCKs.

4. Provide the local community with accurate information on marine sanctuaries so that the development of the marine sanctuary can become a success.

The methods used to provide the community with information depends on which information is required. Considering the sort of information needed the most suitable method can be chosen. Besides informal talks with members of the community three important methods to provide information are:

- * Information center in the office of the kepala desa. In the information center a permanent exhibition on the marine sanctuary and subjects related to the marine sanctuary can be built. Part of the space in the information center can be used to give information on the process in the marine sanctuary. The particular information given in the information center depends on the process in the marine sanctuary and the particular needs of the community.

- * Informative meetings with the community. These meetings should take place on a regular

basis. The purpose is to inform the people about the process in the marine sanctuary. Part of the local community will be closely involved in the marine sanctuary, but this is probably not the case for all people in Tumbak. It is important that these people are kept informed too. One way of doing so is through the information center, but not all people will have a look at the information in the information center. They might be reached through informative meetings. These meetings can also be used to give additional education on coastal ecosystems. When it appears that there exists lack of knowledge on ecosystems or that there are some misconceptions these subjects can be addressed in informative meetings.

Sometimes it might be necessary to invite somebody from outside the community or Proyek Pesisir to provide the information needed by the community in an informative meeting.

* Comparative study of other marine sanctuaries. Sometimes it can be very helpful to learn from experiences of other people. There is no use in reinventing the wheel. Therefore it is good to keep in contact with other communities who have experiences with marine sanctuaries. These can be communities in other field sites of Proyek Pesisir, but also from communities not related to Proyek Pesisir.

The activities can be either field trips to other marine sanctuaries, inviting people from other marine sanctuaries over to Tumbak to be able to share experiences or contact through mail or e-mail. These contacts can provide new insights into marine sanctuaries or can help solving problems occurring in Tumbak. Especially cross visits of Blongko can be arranged easily and can contribute a lot.

5. Set up a small information center in the office of the Kepala Desa.

Although in Tumbak there are no concrete plans of building an information center yet, there should be a place where people can get information. The office of the kepala desa is suitable for that purpose. It is in the middle in the village, so well accessible for all villagers. Besides the extension officer of Proyek Pesisir several other people use the office, putting restraints on the possibilities for using the space as an information center. Most of the walls can be used to put up information. Furthermore, one movable information board can be put in the office. This means that the information materials are limited to those that can be put on the wall or on the information board. The information in the office should be on Proyek Pesisir (activities, goals, outcomes), on coral reef ecosystems (how it works, what people use it for, how this use affects the system and how coral reefs can be preserved) and on health issues (relationship between human activities and health problems).

4.2.4 Specific activities

Bentenan

In this section some of the activities mentioned in section 4.2.3 are worked out in more detail. The activities focused on in this section are the integration of coastal issues into the formal curriculum of the elementary school and the design of exhibitions for the information center.

Integration of coastal issues into formal curriculum

The junior high school in Bentenan has, just like all schools, the possibility to integrate local components in the formal curriculum through Muatan Lokal. Among these local components can be education on coastal issues. The department of education has developed an outline for content to be taught in the coastal component of the Muatan Lokal. However, teachers do not know how they can incorporate these subjects in their classes, although they are interested in doing so. Therefore the teachers are interested in working together with Proyek Pesisir in trying to implement coastal issues in their school.

Proyek Pesisir should provide the teachers with enough background information and materials that can be used. The teachers probably need training in coastal issues, so that they will become capable of teaching that subject matter to their classes.

Since Bentenan is situated on the coast it provides the school with a great opportunity to learn about coastal ecosystems through first hand experiences. The children get a perfect opportunity to link the knowledge taught in the classroom with experiences in the field. Therefore it is necessary to make the school programs experience focused, meaning that the children spend a lot of time learning outside the classroom.

Learning out in the field, however, requires more people who can accompany the children. The class should be split up in small groups. It cannot be expected from teachers that they cut themselves into pieces. That is why extra support is necessary. When going to the field the teachers should be assisted by other people. These can be parents or other people from the community. However, before being able to accompany groups of children doing fieldwork requires special skills. Therefore these people should be trained in working with groups of schoolchildren.

Both the training of teachers and other people helping in the education programs should be taken care of by Proyek Pesisir. Or, if necessary, Proyek Pesisir should contract an organization that can take care of the training.

The programs on coastal issues should be as interactive, active and practice based as possible. Children must spend a lot of time outside the classroom, doing things and finding answers to basic question themselves. The materials that can be used for such programs need to be interactive too. A good way of interactive learning is by using worksheets. Following a short explanation on a certain subject children can be provided with a worksheet on that topic. With the help of the general knowledge they were taught in class and other information sources (natural environment, information center, people in the community) the children should be able to do the assignments on the work sheets. In Appendix II important aspects in making worksheets are listed. A second possibility is to assign a class to make an exhibition for the information center on a certain topic. A third possibility is doing experiments in the field. These can be chemical, biological or physical experiments.

The educational materials should be developed by Proyek Pesisir or by some organization contracted by Proyek Pesisir, because the school teachers in Bentenan are not able to develop the materials because of lack of topical background, time and means. However, the development of the curriculum and materials should be done in close cooperation with the school teachers. Regular meetings, testing and evaluation will be necessary. This cooperation can prevent a situation in which the developed curriculum and materials are not being used, because they do not meet the standards of the teachers.

The curriculum developed by the department of education is not considered suitable for the junior high school in Bentenan. The teachers do not know how to handle the subjects. Therefore a new, better adjusted, curriculum should be developed. This curriculum should be developed for every class of the school, starting with seventh grade and finishing with ninth grade. Every class should basically get the same subjects taught, but more detailed the higher the grade gets.

A central point in this curriculum for all grades should be coastal ecosystems in general. Students need to know the basics of ecosystems before they can understand what is happening in their own surrounding. The first trimester in every grade should be spent on general background information on coastal ecosystems. Second and third trimester can be focused on a special ecosystem (e.g. mangrove forest, coral reefs, sea grass). These specific ecosystems can be discussed in more detail.

Material on all specific coastal ecosystems present in Bentenan should be developed on all grade levels. Each teacher then can choose which specific ecosystem will be central in the program. Every teacher can pick an ecosystem for the second trimester and one for the third trimester. The program for every grade thus should be built along the following structure:

First trimester

General knowledge on coastal ecosystems.

Important aspects that should be addressed are:

- * Energy flow in ecosystems (food chains)
- * Cycles (limitedness of ecosystems)
- * Interaction between organisms
- * Change (evolution, adjustment to the environment (e.g. camouflage))

Second trimester

More detailed attendance of one specific ecosystem

Examples are:

- * Coral reefs
- * Mangrove forests
- * Sea grass ecosystems

Third trimester

More detailed attendance of one specific ecosystem (a different ecosystem than the one addressed in the second trimester)

In all education on ecosystems at all levels attention should be paid to the role humanity plays in it. This must both be in what way people use the specific ecosystems and what the effects of human activities on the ecosystem are. Especially in higher grades this should be an important topic. Children must realize that humans are part of the ecosystems, just as fish and trees are.

When the curriculum has proven to be working fine in Bentenan, attempts can be made to expand it to other villages. Therefore it is important to get the department of education involved in the program. A good way of getting them involved is by inviting them over to Bentenan to participate in one of the programs, so that they can see for themselves how good the curriculum is. When they get positive information on the curriculum on a regular basis, this may be a stimulation for them to implement the developed curriculum in other villages as well. Besides getting the department of education involved, an outreach program to schools in other villages should be started when the program is running smoothly in Bentenan. The implementation of coastal issues in formal curriculum at the regional level is also discussed in section 3.

Exhibitions in the information center

Important aspects of the exhibitions in the information center have already been discussed in section 4.2.3. The exact outline of the exhibitions is dependent on the topics discussed. In this section a rough layout for the information center is drawn, together with an explanation on the layout. Besides the layout of the information center, information on important aspects in designing an exhibition is provided for in Appendix I. A sketch of the layout of the information center is included in appendix III.

The space that can be used for the information center can be divided into two sections, a small section in the back that can be locked and a bigger, open section in the front. Both these sections can be used for exhibits. However, the openness of the front section has an impact on the way the

exhibits should be designed. A condition is that the exhibits are movable. When the information center is closed and at night the exhibits must be locked away in the section in the back to prevent the materials from being stolen or destroyed. This means that the materials must not be too heavy, too big or solidly attached to the building.

The open section has major impacts on the information center. The first impact is that the outside walls cannot be used to display materials, since there are no walls. Therefore other possible displays have to be used. The second major impact of the openness is the availability of sunlight. Light is extremely important to an exhibition. People must be able to see the exhibits and without enough light this is not possible. Another factor that has to be taken into account are weather conditions. Because the space is open, the exhibits will be subject to weather conditions, such as rain, wind and sunlight. The materials used for the exhibits should be able to stand weather influences. Photos and other display materials should be laminated when possible.

The two sections of the information center should be used in different ways. The open section in the front should be used to provide general information on *Proyek Pesisir* and coastal issues in Bentenan. The section in the back should be used to provide more detailed information to people who are interested. The front section is from a psychological point of view is more accessible than the section in the back. Therefore information focusing on a large audience should be displayed in the front, while more detailed information focusing on a more specific audience can be provided in the back.

As stated in section 4.2.3 the information center should be subdivided into several smaller sections, each focusing on a certain topic. This can be accomplished by putting several information boards perpendicular to the walls. Putting the boards in this way has two major advantages. The first is that it divides the room into several sections. The boards provide a physical boundary between sections. The second advantage is the fact that both sides of the boards can be used for displays. Besides the rectangular information board, other forms of information boards can be used, such as triangular ones. A big advantage of this information board is that people can walk around it.

Each information board should discuss a different topic. This means that in the information center the amount of topics should not exceed three. Possible topics for the information center in Bentenan are erosion and the impact of garbage disposal on coastal ecosystems. The third information board can be used to provide information on *Proyek Pesisir*.

However, information boards cannot be used to put down materials other than photos, drawings and texts. To be able to display materials other than those that can be put on information boards (e.g. shells, fishing equipment, garbage) shelves can be constructed along the wall underneath the windows. For even more space a cupboard can be constructed instead of a shelf. The wall between the open space in the front and the closed section in the back can also be used to display information.

Besides the exhibits on different topics a section should be designed especially for school children. For children it is even more important than for adults that exhibits are interactive. Exhibits should invite children to do something and actively interact with the exhibits. This can be done through puzzles or question and answer games. Question and answer games can be easily made. One can write the question on a small flap. Children should think of possible answers. To check their answer, they can open the flap. The answer should be written down on the back of the flap. Exhibits for schoolchildren can be made in a special corner totally focusing on school children.

In the closed section in the back of the building a miniature library can be organized. The books should be easy accessible, but not be lent out. People can read these books in the information center,

but cannot bring them home with them. The table in the back can be used by people who want to browse the library, but is also suitable to small meetings and as a place to put written materials on Proyek Pesisir, such as brochures and fact sheets.

The furniture described above should be completed with several benches that can be used to sit down for a while, read a book, or they can be carried to the ground floor when having a community meeting.

Tumbak

In this section one of the activities mentioned in section 4.2.3 is described in more detail. The activity focused on in this section is the design of exhibitions for the small information center in the office of the kepala desa.

Set up a small information center in the office of the Kepala Desa

Important aspects of the small information center in the office of the kepala desa have already been discussed in section 4.2.3. The exact outline of the exhibitions is dependent on the topics discussed. In this section a rough layout for the small information center is drawn, together with an explanation on the layout. Besides the layout of the information center information on important aspects in designing an exhibition is provided for in Appendix I.

The information center in Tumbak will be different from the information centers in the other villages. In the other villages the buildings used are designed especially for being an information center, while in Tumbak, the office of the kepala desa is used. This has influence on the possibilities for providing information. Space for information is extremely limited because it is a small office and the office is not solely used as an environmental information center.

Provision of information will be limited to information hung on the walls of the office and probably one small information board put on the right side of the main door entering the office. This information board should not be too big, because a big board will cut off part of the office. This results in a smaller area suitable for provision of information. When the board is small enough, people can walk around it. This opens the opportunity to use both the front and the back of the board. However, people will be more likely to see the front than the back, so important information should be put on the front of the board. When it is mentioned on the front that more information can be found on the back of the board, this will stimulate people to walk around the board.

In addition to this one information board, information can be hung on three of the walls of the office. All three walls should be visible from the main door of the office. This is true for the three small walls facing the main entrance.

As stated in section 4.2.3 the information center should be subdivided into several smaller sections, each focusing on a certain topic. In Tumbak this can only be accomplished by putting different topics on different boards or walls. Space in the office is extremely limited forcing the amount of information to be limited too. This means that in the information center the amount of topics should be limited and definitely not exceed three. Possible topics for the information center in Tumbak are Proyek Pesisir, coral reef ecosystems and health issues. Information on Proyek Pesisir can be put on the information board right from the door. The other two topics can be discussed on information boards on the walls. Dependent on the amount of information it can be decided which topic needs two walls and which topic needs one. One wall should not be used for two different topics at the same time as it will make the displays less clear.

4.2.5 Recommendations

Bentenan

* For the development of curriculum for coastal issues it is important that there is good cooperation between the ones developing the curriculum and materials (Proyek Pesisir) and the ones having to implement it (teachers). The rough outline must be drawn by the developers and implementers together. The development team should not start developing right away. Furthermore it is recommended not to develop all materials at the same time. Start with materials on one topic, then test it in practice, evaluate, readjust, try again, until a good concept is found. Only then start producing materials on other topics.

* In the development of curriculum, Blongko and Bentenan should work together. In both villages formal educational curriculum will be developed. Although on different levels, cooperation between both villages is welcome.

* The actual development of curriculum and materials can be contracted out. However, when contracting it out, the process should be carefully monitored by Proyek Pesisir. Meetings to discuss and evaluate the developed materials must be planned on a regular and frequent basis. Coordination of the process will be a task of the education officer of Proyek Pesisir (see section 6).

* Development of formal curriculum takes a long time. However, before the curriculum is ready to be implemented in the school, Proyek Pesisir can provide incidental programs on coastal issues for the schools. At the moment the time available for Muatan Lokal is not used, so why not use it to teach about coastal ecosystems on a ad hoc basis until formal curriculum is developed.

* Although plans for building an information center are made in Bentenan, the exact location is not yet decided on. From an education and communication point of view, it would be best to build the information center in Dusun IV. This location is close to the shore and relatively in the middle of the village and close to the market. The central location is important considering accessibility for villagers. When the information center is too far away, people will not visit it.

* Electrification of the information center must be considered. It is recommended to provide the information center with electricity, so that the center can be used in the evening too, either as information center or as meeting place. The sort of lighting must be considered.

* Because of the extensiveness of Bentenan, the information center will be far away from some of the villagers houses (mainly Dusun I and Dusun V). Therefore it is recommended to build, in addition to the information center, information boards in these two dusuns. Through these information boards, information on issues specific for those dusuns can be provided. It is important that these information boards can stand weather conditions and will be built in a place where many people can see it.

* Bentenan Beach Resort is hundreds and sometimes thousands of local tourists during the weekend. These local tourists form one of the many target groups of Proyek Pesisir education activities. Therefore it is recommended to explore the possibilities of providing information through Bentenan Beach Resort. It would be a great opportunity to have some information boards on Bentenan Beach Resort beaches. Through these boards, information can be given on coastal ecosystems. This information should be fully focused on tourists, many of whom are from the uplands and therefore non-coastal residents. It should be adjusted to their interests in coastal ecosystems, which is a nice place to spend the weekend. If and when additional tourism enterprises are developed in Bentenan, such

as glass bottom boat tours, snorkel tours, mangrove tours in cooperation with Tumbak, additional exhibits and information targeted at these activities should be developed.

Tumbak

* While no concrete plans for building an information center exist in Tumbak yet, it is recommended to build an information center in the future. The office of the kepala desa can be used for these purposes temporarily, but actually the office is too small.

* Besides provision of information through an information center, information boards in the village are another possibility. One information board on each end of the village can form a good addition to information provided through the information center. These information boards should be built on a place where a lot of people can see it. Probably suitable locations are along the road or in the vicinity of the mosque.

* In the long term, coastal issues should be implemented in formal curriculum of the elementary school of Tumbak too. However, this curriculum should be developed and tested in Blongko first. When curriculum is developed in Blongko it can be transferred to Tumbak.

* Development of formal curriculum takes a long time. However, before the curriculum is ready to be implemented in the school in Tumbak, Proyek Pesisir can provide incidental programs on coastal issues for the schools. At the moment the time available for Muatan Lokal is not used, so why not use it to teach about ecosystems.

4.3 TALISE

4.3.1 Introduction

In Talise the extension officer has already carried out several environmental education activities over the last year. Besides a lot of informal talks with the local community several educational programs (presentation and discussion) on health issues, coastal erosion and coral reef ecosystems have been organized. However, these activities are basically stand alone activities that are not yet part of a greater environmental strategy. In the coming year the cautious steps already taken during last year must be followed by another step forward. Therefore an educational strategy, in which all activities can be embedded is necessary.

The main educational development at the moment in Talise is the building of an information center on Talise Island in dusun II. The building is still under construction but is planned to be finished soon. This information center will play an important role in environmental education in Talise in the future.

The main issues going on in Talise at the moment are a lack of land ownership, erosion, poor health situation and lack of clean water supply (mainly on Kinabohutan), unsustainable use of forestry resources and possibilities to develop ecotourism. These issues should be addressed in the education strategy as well. Besides these main issues, attention will be paid to increasing children's knowledge on coastal ecosystems.

4.3.2 Goals, objectives and strategies

The main goals of educational activities in Talise will be:

1. Increasing children's knowledge on coastal ecosystems. Children are the leaders of the future. Therefore it is important that they have insights into coastal issues. When they start learning about the importance of coastal ecosystems, its assets and the threats upon it, when still young, they can become good tenants of coastal ecosystems for the future. There is no better place to learn about coastal issues than coastal areas itself. When children can learn about features happening in their own backyard, they recognize their own interrelationship with the issue, which makes the message stronger. Children learning about their own environment can lead to appreciation of that environment, which eventually can lead to environmental conscious people who behave accordingly.

2. Stimulating responsible water use and increasing knowledge on the interrelationship between human activities and health. Especially on Kinabohutan the community lacks clean water supply and has numerous health problems. Because of the lack of clean water it is necessary that the available water is used in a responsible way. In promoting responsible water use education can play an important role. The role of education is to explain to people that water used for washing clothes and dishes, washing cattle and to relieve oneself is not suitable for drinking. To improve the health situation it is necessary that people know how to use water in a responsible way. Besides education this problem needs more technical action to improve the availability of clean drinking water.

3. Increasing the knowledge on the relationship between human activities and erosion and ways to prevent erosion from happening. People in Talise are confronted with erosion of the beach, but they do not know how they can prevent this erosion. They say that they have no influence on it. It may be true that the people in Bentenan have no influence on the erosion caused by the sea, but human behavior has impact on erosion by the sea. Coral reefs protect beaches against erosion, but when coral reefs are degraded through coral mining or bomb fishing, they provide less protection against erosion.

Besides shoreline erosion another problem is probably caused by water run off from the mainland. This can cause sedimentation on coral reefs resulting in suffocation of the coral. This can be caused by human activities such as cutting down vegetation and agriculture. Education can help the people understand what they can do to prevent erosion and sedimentation and how to deal with existing erosion and sedimentation problems (e.g. where to build houses and other constructions). When people have insight in the erosion problem and ways to prevent these problems they can act accordingly.

4. Stimulating a well-thought decision on the development of ecotourism. Talise island has good potential for the development of ecotourism with its forests, white sand beaches and coral reefs. It is tempting for the community to think of developing tourism on the island. However, tourism not only brings money into the community, but also requires certain adjustments in the community. Tourists request a certain standard of accommodation and other facilities. Both the advantages and disadvantages have to be thought of before starting to develop tourism facilities in the village. The community of Talise does not have experience with tourism. Therefore it is necessary to provide them with information on the implications of tourism, so that they can make a good decision on whether they want to develop ecotourism and how they want to develop it.

5. Set up the information center, design and work out exhibitions of the center. The information center plays an important role in the provision of information to the population of Talise. For the continuation and success of Proyek Pesisir it is important that the local people are kept well informed on the activities of Proyek Pesisir and the major coastal issues appearing in Talise. The information center can play an important role in the provision of this information. Besides information on project activities and coastal issues, it might be necessary to give information on certain

subjects that are not yet well understood by (part of) the community. Again, the information center is a good means to provide this information.

The information in the information center will be mainly provided through information boards. However, besides the information boards, some interactive materials should be developed. Especially for children it is important that they are invited to do or touch something while learning. The exhibitions in the information center must be focused on specific, topical issues. It should be remembered that too much information about too great a variety of subjects will be contra productive. The information center, thus should provide information on a limited amount of subjects. The exhibitions should be kept up-to-date. Eventually, when tourism starts to develop on the island, exhibits can be adjusted to inform visitors about coastal and island ecosystems, about local wildlife, and areas for eco-hiking and snorkeling.

4.3.3 Approaches and methods

Each of the five goals and objectives mentioned in section 4.3.2 request a different approach and a different set of methods. The approaches for each of them will be discussed in this section.

1. Increasing children's knowledge on coastal ecosystems.

In Talise it was decided to start educating children through non formal education. This choice is partly influenced by the fact that in Talise, especially on Kinabohutan, a lot of children do not go to school. When focusing on formal education, these children will not be reached. Another implication of low school attendance rates is illiteracy. This means that written materials cannot be used to reach these children. Addressing coastal issues through non formal education requires other approaches and methods than when using formal education. Methods that can be used to increase children's knowledge on coastal ecosystems are:

* Non formal educational programs with children. The extension officer and/or the assistant can organize educational programs focusing on children who do not go to school. Children can participate in the program on a voluntary basis. These kind of programs can take place regularly and on a fixed time in the week (e.g. every first and third Wednesday of the month). The time of the program should be adjusted to other activities of the children, so that the programs do not coincide with other activities. Programs on a regular and frequent basis are important for continuation of the program (at least once a month).

The topic of the program should be easy and inviting. Children do not have a lot of foreknowledge, so the programs have to be simple. Inviting programs are important, because otherwise no children will show up. The program must be more attractive than doing the things children normally do. This implies that the programs must be extremely informal. Children usually do not like going to school, so one should prevent the programs from being like school. A Way of making the programs attractive is using materials children have never seen before, such as overhead projector or video. Or rent a boat and take the children out to the sea and let them experience the beauty of coral reefs. However, these special events are not necessary in every program. Educational programs can be made attractive by making them active. Children usually like being invited to do things and find things out themselves. Therefore it is necessary that the educational program invites them to explore.

It is especially important that the first program is a big hit. When children involved in that program like it, they will show up next time and probably bring their friends with them. After several programs, probably a core group of children will be formed who attend the programs.

The topic of the program should be the environment in general. Whatever children can experience in their direct surroundings is a potential topic for the program. The main goal of the programs is building awareness of the environment and its beauty. The programs should never be problem based, such as the hazards of destructive fishing or erosion. But rather the beauty of coral reefs, life in coral reefs or life in the forest.

* Posters. Posters can be used for both children who go to school and children who do not attend school. However, two aspects have to be kept in mind. First, posters must provide information without using texts. Not all children can read, so the message of the poster must be made clear through drawings or photos. This does not automatically mean that there can be no texts on the posters. Through texts, extra information can be provided, but these texts should not be necessary to understand the message. The second aspect that has to be kept in mind is the costs of printing a poster. A poster is only cost effective when a great number is printed. Therefore the message on the poster should be general enough so that the poster can be used in at least all the field sites of Proyek Pesisir. A suitable topic for a poster can be coral reefs. Posters can be distributed to schools and other public buildings in the villages (e.g. information center, office of kepala desa, health post). If only a limited number of posters is to be developed (less than ten), instead of expensive printing, they can be made and colored by local graphic designers and artists.

* Comic book. As with posters, comic books can be used for both children attending school and those who do not. Children like reading comic books and even children who cannot read can understand comics. The comic should focus on coastal ecosystems. An example of a story could be the importance of coral reefs for coastal communities and what threatens coral reefs. A requirement for a comic book is good quality. Drawings must be clear and attractive and it should tell a good story. Therefore it is probably necessary to contract a comic designer. The story should be discussed with the designer before he starts drawing. As with posters, comic books will probably only be cost effective when printed in great quantity. Therefore it is necessary that the comics can be used for different purposes.

* Integration of coastal issues into formal curriculum. After a formal curriculum has been developed in Blongko and Bentenan it can be implemented in schools in Talise. Until coastal issues can be integrated into formal curriculum Proyek Pesisir can provide incidental programs on coastal issues for the schools.

2. Stimulating responsible water use and increasing knowledge on the interrelationship between human activities and health.

This issue is basically caused by a combination between a lack of clean water and a lack of information on the effects of drinking contaminated water and the interrelationship between human activities and water contamination. The availability of clean water cannot be improved by education, but education can play a role in the second part by providing information on responsible water use and raising awareness of interrelationships between human activities and health. In dusun I it is important that in education protection of the critical watershed is emphasized. The surroundings of the springs that provide drinking water to the village must be protected. Several educational activities that can be used, are:

* Informal talks with the people. In these talks relations between human activities and water quality and health issues can be discussed.

* Informative meetings. These meetings can be done by either the extension officer herself, or a guest can be invited to give a presentation on a certain topic concerning health, such as health problems caused by drinking contaminated water and what to do to prevent these problems. Examples of people who can be invited are people from a PUSKESMAS or a hospital or a water quality expert.

An important issue that should be addressed in these meetings is responsible water use. This is especially important for Kinabohutan. Since fresh water is not abundantly available in Kinabohutan people should use it in a responsible way. By responsible is also meant not to collect drinking water at a place where other people take a bath or wash their clothes.

* Information on health and water issues in the information center. In the information center an exhibit on health and water issues should be built. In these exhibits attention should be paid to the relationship between human behavior and health and water availability problems and how this behavior can be changed to improve the health situation.

3. Increasing the knowledge on the relationship between human activities and erosion and ways to prevent erosion from happening.

The issue of erosion can be addressed in different educational activities. One activity that is always important are informal talks with members of the community. However, this is an activity that is non-structured and can take place at any time of the day. Besides informal talks, several structured educational activities can be carried out. The two main structured activities should be:

* Exhibits in the information center. In the information center an exhibit on erosion problems should be built. In this exhibit attention can be paid to causes of erosion, consequences for the community and possible actions to be taken to prevent erosion or reduce the negative effects. Local Proyek Pesisir consultants (e.g. Pierre Gosal or Febrina Sumanti, coastal processes consultants from the Faculty of Engineering of University Sam Ratulangi) can help with the technical content of these displays. The information center will be discussed in more detail below and in section 4.3.4.

* Informative meetings with the community. The community thinks that they do not have any influence on erosion of the beach in front of the village. Partially this might be true, but partially, erosion is caused by human activities in the village and one thing the community can do is anticipate to the current erosion (e.g. by not building houses in places vulnerable to erosion). Possible human actions that can be taken to prevent erosion from happening or having negative effects should be the main focus in the educational programs.

It might be necessary to invite an erosion specialist (e.g. Pierre Gosal or Febrina Sumanti) to help with these programs. An erosion specialist can, for instance, be invited to do part of the educational program, give a presentation on erosion issues or can give background information that can be of use to the extension officer.

* Promotion of agroforestry and other sedimentation/erosion prevention methods through demonstration plots. Soil run off from the hills on Talise Island can occur when the hillsides are not covered with vegetation. Extensive agriculture can cause extra soil erosion. Impact of this erosion can be sedimentation on reefs which can smother them. One way of preventing sedimentation/erosion is agroforestry. This method should be promoted to upland farmers. A good way of doing so is by building demonstration plots. On these plots agroforestry can be practiced, so that farmers can see how the method works and what the advantages are. It is important that farmers are involved in the process of the demonstration plot, so they have good

opportunities to monitor the developments. Demonstration plots can only be developed when the land ownership is arranged. There will probably be no results when land ownership is not arranged yet.

4. Stimulating a well-thought decision on the development of ecotourism.

As stated earlier, Talise has good tourism potential, but development of tourism should be a well-thought decision of the community. For such a decision, sufficient and accurate information is necessary. Furthermore, the community should discuss in which way they want to develop ecotourism. Methods to be used are:

* Informative meetings with the community. To make a good decision the people in Talise should know what impact tourism has on the village. It is very tempting to develop tourism because it provides income to (some of) the people, but tourism is not all sunshine. To be able to make a good decision on whether to develop tourism facilities or not, it is important that the people have adequate information. This information can be provided through informative meetings. The extension officer can invite tourism experts or people who already have experience with tourism (e.g. people from Bunaken) to tell about their experiences and the implications tourism can have on a society. Furthermore, people can be informed about requirements of tourists considering accommodation, sightseeing, food, and so on. People should be aware of requirements and consequences of tourism.

* Discussions in the village. It is not only important that people know the requirements and consequences of tourism, but also that there is consensus in the community on how to develop tourism. Therefore it is important that details are discussed in the community. Aspects that should be addressed are, among others, where will the tourists stay, how many rooms will be made to lodge tourists, who will be guides for the tourists and how will revenues be split. It is important that the majority of the village is in favor of tourism and that as many people as possible benefit from tourism.

5. Set up the information center, design and work out exhibitions of the center.

The information center should provide information on Proyek Pesisir (what is the project about, what are the goals, what are the activities) and on important coastal issues in Talise.

The space in the information center should be divided in several sections. Each section should be used to provide information on a certain topic. It is important, especially because space in the information center is limited, that the number of sections is limited too. There must be one section on Proyek Pesisir, one section focusing on children, and then about two or three other sections on important coastal issues in Talise. These issues can, for instance, be erosion, health issues and ecotourism. The section focusing on children can be arranged in two different ways, either a special corner in the center or the information for children put under the information focusing on adults. A separate section for children is preferred.

The topic of the exhibitions for children must be tuned to the interest of children. Exhibits for children should be far less problem based than exhibits for adults. Examples of exhibits for children are life in coral reefs and the life of sea turtles.

For all the exhibitions, it is important that they provide accurate and actual information. Another condition, especially important for the exhibition for children, is the interactive character of the exhibitions. The exhibitions thus should be a combination of information boards and more interactive methods. Examples of interactive materials are puzzles, question and answer games and question

sheets. Another way of making the information center more interactive is giving people the chance to participate in the development of exhibitions. Already existing groups in the community, such as fishermen groups or farmer groups, should be invited to participate in the development of exhibitions. Schoolchildren should be given the possibility as well. For instance, children in junior high school can design an exhibition focusing on other children in lower grades.

Another method to provide information in the information center is the availability of books in a small library. People interested in a certain topic then can come to the information center to look for information in the books available in the library. The information center will be discussed in more detail in section 4.3.4.

4.3.4 Specific activities

In this section one of the activities mentioned in section 4.3.3 is worked out in more detail. The activity focused on in this section is the design of exhibitions for the information center.

Exhibitions in the information center

Important aspects of the exhibitions in the information center have already been discussed in section 4.3.3. The exact outline of the exhibitions is dependent on the topics discussed. In this section a rough layout for the information center is drawn, together with an explanation on the layout. Besides the layout of the information center, information on important aspects in designing an exhibition is provided for in Appendix I. A sketch of the layout of the information center is included in Appendix III.

The building meant to be the information center is about 16 meters long and 8 meters wide. It was not decided yet whether the building would be divided into two rooms, or that it would remain one room. It is recommended to make a small room in the back. This small room (3 meters times 8 meters) can be used for administrative and storage purposes. The big room in the front will be used as an information center and meeting room. On the entrance wall to the left and right from the front door are windows. The full length of the left wall (seen when coming in through the front door) windows. The right wall is a blind wall with no windows. This implicates that the wall on the right can be used to display information while the windows make it possible for an abundance of sunlight to enter the room. Another factor that has to be taken into account are weather conditions. Because the space is open, the exhibits will be subject to weather conditions, such as rain, wind and sunlight. The materials used for the exhibits should be able to stand weather influences. Photos and other display materials should be laminated when possible.

As stated in section 4.3.3 the information center should be divided into sections. This can be accomplished by putting movable information boards perpendicular to the wall. Putting the board this way has some major advantages. The first is that it divides the room into sections. The board provides a physical boundary between sections. The second major advantage is the fact that both sides of the board can be used for displays. By putting the boards perpendicular to the wall and especially to the windows they do not block the light from entering the room. An information board in front of the window standing parallel to it would block the light, which can result in the fact that displays on the opposite wall are not visible because of lack of light.

It is necessary that the information board can be moved, so that the room can be used for meetings too. When there is a community meeting the information boards can be put to the side of the room. After the meeting the information boards can be put back again.

By putting two information boards perpendicular to the walls (see Appendix V) three different sections can be created. Each section can be used to display information on a certain topic. Three topics that can be presented are: erosion, health and clean water, and ecotourism. Putting the information boards like this creates a walkway along the exhibits. People will be able to see all the exhibits. To be able to display materials other than those put on an information board (e.g. models, aquariums) shelves can be constructed along the walls. For even more space a cupboard could be constructed instead of a shelf. The wall between the exposition room and the administration office in the back can be used to provide information on Proyek Pesisir. The corner to the right from the front door can be used for an exhibit focusing on children. In the back of the exposition room, behind the information board furthest back, a cupboard with books and a table can be put. This cupboard can be considered a miniature library. The books should be easy accessible, but not be lent out. People can come to the information center to read the books, but cannot bring them home with them. They can sit at the table. The table can also be used to display Proyek Pesisir information materials, such as brochures and fact sheets. The furniture described above should be completed with several benches, that can be used to sit down for a while, read a book or when having a meeting.

4.3.5 Recommendations

* Because of the extensiveness of the village and especially because it is spread over two islands people from dusun I and Kinabohutan have to travel a long way to visit the information center. Therefore it is recommended to develop information centers eventually in all three dusuns. In dusun I the office of the kepala desa and extension officer can be used as an information center. The big room is perfectly suitable as an information center. In Kinabohutan it will be necessary to build a new building.

* Electrification of the information center in Talise is necessary, because the building will also be used as meeting place. The majority of meetings will take place in the evening, making electricity necessary.

* Use all kinds of public buildings and transportation means (e.g. schools, health post, taxi boats) to provide information on coastal issues.

* Integrate coastal issues in formal education. On longer term formal curriculum developed in Blongko and Bentenan can be integrated in the schools in Talise. Before the curriculum is ready to be implemented in schools in Talise, Proyek Pesisir can provide incidental programs on coastal issues to the schools. Through schools, a large group of children can be reached easily.

5.0 ROLE OF THE PUBLIC EDUCATION STRATEGY IN NRM PERFORMANCE MONITORING

The public education strategy for North Sulawesi provides an overall supporting role to achieving Proyek Pesisir objectives of developing models of best practices in coastal management and ensuring their replication in areas outside of USAID-assisted field sites. As such, there is no separate indicator out of the 28 PMP (Performance Monitoring Plan) indicators which Proyek Pesisir must report on for evaluating program performance which by itself captures the results of the public education strategy. However, the activities outlined in the strategy contribute to several of the indicators as described below. Hence, public education activities must be monitored and results recorded under the proper indicator categories. While the strategy itself does attempt to set

targets for any of these indicators, the process of developing PMP targets for each indicator must include the contributions provided through implementation of the strategy. It is recommended that the contributions of the public education strategy to PMP targets for each indicator be included as part of the end of Year 2 review and Year 3 work planning process, as well as part of the life-of-project strategy to be developed.

Indicator No. 1 & 2 (total area under best practice at USAID sites and in replication areas): A public education strategy is assumed to be a key element of “Best Practice” for a management planning process. A planning process without a public education strategy linked to key management issues identified at the field sites and linked to public participation activities, will not lead to socially sustainable best practices resulting in improved environmental conditions. Best practices imply changes in behaviors of how resource users relate to and utilize coastal resources. Public education is a necessary ingredient to changing behaviors. Sustainable and on-going public education on coastal issues can be considered by itself, as a best practice as well.

Indicator No. 3 (Institutional Development): One goal of the public education strategy is to increase capacity of local institutions to design and implement public education programs in support of coastal management initiatives. Hence, the institutional strengthening components of the strategy contribute to this indicator for those institutions involved with public education implementation, including TVRI, NGOs, the local university, and the Ministry of Education.

Indicator No. 7 & 14 (Number of Publications): Brochures, bulletins, posters, newspaper articles, videos, public school educational curriculum materials, and even the exhibitions created in each of the information centers can be considered as publications produced by the project. Therefore, these products should be recorded under this category. The number of individuals visiting the information centers, and distribution of educational materials and documents should be counted as well.

Indicator No 8 & 18 (Training and Workshops): Some public education activities fall within these categories such as training of staff or teachers in public education methods. Some training and workshop events for stakeholders in the field sites are fully or partly categorized as public education activities. Decisions need to be made as to whether the event is primarily a training event or workshop, or whether it should fall under one of the other indicators such as a presentation (Indicator No. 15), hands on experience (Indicator No. 19) or key meeting (Indicator No. 26). Where allowed, it can be counted under more than one of these categories.

Indicator No. 10 (New Institutional Structures): In cases where public education groups have been formally established (such as in Blongko as part of the marine sanctuary management team), these institutions can be included under this indicator.

Indicator No. 11 (Stakeholder participation): Public participation events and meetings are part of management initiatives. Therefore, involvement of stakeholder groups in public education events should be considered when scoring the various stakeholder groups level of participation.

Indicator No. 12 (CRM Index): Public participation activities are one type of many implementation activities and therefore need to be factored into the scores for Step 2 - 5. A public education and awareness building program is a specific category under “Governance Capacity Building Activities (b.).

Media (Indicator No. 17): Public education activities using the mass media should be recorded here.

ICM Policy adoption (Indicator No. 21): If the Ministry of Education adopts a policy of integrating Proyek Pesisir developed coastal education curriculum into the local content requirement, or implements a policy/program of teacher training in coastal curriculum, it should be listed here.

In-kind contributions (Indicator No. 22): Contributions of mass media organizations, particularly TVRI on the production of videos, should be included here. Cooperation of personnel or resources of the Ministry of Education, including teachers time involved in project supported training events, and assistance with implementation of educational events in the schools, should be listed here.

6.0 RECOMMENDATIONS

Consistency of products

Proyek Pesisir should try to accomplish consistency in the look of its outputs, such as brochures, fact sheets, stickers, reports, T-shirts and so on. It is important that people, when they see a product of Proyek Pesisir, they recognize it as being a Proyek Pesisir product right away. Therefore it is necessary that all Proyek Pesisir outputs have the same style. It is recommended to use the pictures and style of the Proyek Pesisir logo. It is also important that Proyek Pesisir uses as environmental friendly materials as possible. Proyek Pesisir is an environmental project which should give the right example to other people.

One way to accomplish unity is to develop a set of about three or four different T-shirts with one of the Proyek Pesisir drawings and a slogan on it. These T-shirts can be used to give to participants of Proyek Pesisir training or on other occasions. The slogans on the T-shirts must be short and catchy and be positive. Examples are: I protect coral reefs! or Save our coral reefs! The same slogans can be used to put on bumper stickers too. For bumper stickers it is important that the letters are big enough. People must be able to read it from a distance. It is important to limit the number of different slogans. It is better to have one good slogan than ten average ones. The same slogans can be used on stickers for microlets as well. These stickers can contain a slogan, the Proyek Pesisir logo and the costs for taking a microlet. These stickers can be distributed in Manado.

A public education boat

For education at the regional level in the long run it would be good if Proyek Pesisir equipped an educational boat. The great advantage of having a boat is its mobility. In this way Proyek Pesisir can go to the people instead of letting people come to Proyek Pesisir. This boat should have a full range of materials on board, such as snorkeling gear, glass bottomed buckets (or a glass bottom boat) so that you can take people out into the field, written materials, educational packages, information boards or posters and other materials necessary in educational programs. Besides the materials the boat should have an educational crew, which can do educational programs for schools and other groups. This crew should be recruited at the Proyek Pesisir field sites. The crew must be trained in carrying out environmental education activities. The boat can also be used for special events and field trips.

Hotel displays

A way of promoting Proyek Pesisir and coastal issues in Manado is putting information in hotels in Manado (such as the photos in the Hotel Century Manado). It would be good when this can be extended to other hotels in Manado.

Posters

Develop one poster on coastal ecosystems that can be distributed to all elementary schools in the region. Schools are generally very interested in materials like posters. Posters can be part of the educational materials for the outreach program for the formal curriculum (through the education boat). After the schools have participated in the program they can be given a poster and maybe some other materials. This poster should provide general information on coastal ecosystems. The information on the poster should be simple and general.

Publication compilation

Compile all Proyek Pesisir publications (brochures, fact sheets, briefing notes, etcetera) in a file. Make a file for every field site and one for the Manado office. These files can be put in the information centers in the villages, so that interested people can browse through all Proyek Pesisir materials and get copies when required. Such files can be made for educational materials as well. Materials developed in one of the field sites or in the Manado office can be copied for the other field sites. In this way the extension officers in the field sites can use the experience and already developed materials from the other field sites. Extension officers can make sure that the materials are distributed to the other field sites.

Contracting curriculum development

It will probably be necessary to contract out the development of curriculum and necessary educational materials, due to lack of staff and experience at Proyek Pesisir. In choosing someone who can develop the curriculum it is important that the organization already has experience in developing educational materials and has general knowledge on ecology. When not one organization with all the necessary knowledge and experience can be found, then a core group of education developers and ecologists can be formed. Possible organizations who can be involved in the development of curriculum and educational materials are Department of Education and Culture, Sam Ratulangi University, IKIP Manado, NGOs (e.g. Kelola). Regardless who will develop curriculum and materials, the process should be well monitored by Proyek Pesisir. This will be one of the tasks of the newly installed environmental education officer (see next point). It is necessary that Proyek Pesisir finds out which organisations have the capacity and capability to participate in the development of formal curriculum on coastal ecology. An inventory of capability and capacity should be made before year three, so that in year three actual contracting can be arranged.

Creating a function of Environmental Education Officer

To be able to coordinate and handle the educational activities planned for next year, it is necessary that the extension officers in the field sites will be supported by an environmental education officer in the Manado office. This environmental education officer should be responsible for the educational activities at the regional level and support for the extension officers at the field site level. Meidy is a good candidate for the function of environmental education officer.

The main tasks of the environmental education officer will be:

- * Supporting extension officers in the field sites whenever assistance with educational activities is necessary. In developing educational activities, it is very important that ideas can be discussed with someone else. The best results are reached when working in a team.
- * Coordinating the development of formal curriculum and educational materials. The environmental education officer forms the intermediate between the development team, department of education and the teachers who have to carry out the programs. The environmental education

officer has to make sure that materials are developed, materials and curriculum are adjusted to the needs of the teachers, materials and methods are tested in practice and the department of education keeps informed on the process.

* Coordinating the development of educational materials for the field sites. Sometimes materials developed in one of the field sites can be of use in other field sites as well or necessary materials cannot be developed in the field sites. The environmental education officer should coordinate exchange between field sites and keep up the production of educational materials.

* Coordinating and carrying out educational activities at the regional level. Among these activities are: making exhibitions, providing information through the Manado office, keeping contact with TVRI and other media.

* Coordinating production of educational materials with the Communications Unit PKSPL-IPB. Whenever the Communications Unit needs to print educational materials the environmental education officer should arrange this and provide the Communications Unit with the necessary copy.

* Evaluating educational activities, both at the field site level and regional level. Evaluation of activities is extremely important in improving quality over time. Each extension officer should evaluate all activities, but in addition it can be helpful when the environmental education officer gives feedback on educational activities on a regular basis.

* Managing the stock of educational materials in the Manado office. The stock of educational materials must be kept up to date and complete. Wherever possible it should be replenished with new materials.

Training of environmental education officer

* The environmental education officer should go to visit Pusat Pendidikan Lingkungan Hidup Seloliman (PPLH Seloliman) in East Java. PPLH Seloliman has been doing environmental education programs for almost ten years. The purpose of the visit of the environmental education officer is to learn from the experiences of PPLH staff and see how they educate groups of schoolchildren coming to the environmental education center. This experience can be of help in the process of developing environmental education for Proyek Pesisir. A visit of about three or four weeks will be sufficient. Also dependent on the experiences of the environmental education officer it might be good to send the extension officers to PPLH Seloliman as well for training. Two to three weeks will be sufficient. The address of PPLH Seloliman is: P.O. Box 03, Trawas, Mojokerto 61375, Indonesia, Fax: (0343) 880884, E-mail: pplh@sby.centrin.net.id

* It might be good for the environmental education officer to follow a course on environmental education. Such courses probably do not exist yet in Indonesia, therefore it will be necessary to go abroad to either the United States, Canada, Australia, Philippines or India. It is necessary to find out where courses in environmental education are given. Several possibilities are: CRC-URI, Yukon College in Canada, Silliman University and University of the Philippines Los Barros in the Philippines. An important condition will be that the environmental education officer is capable of communicating in English.

Training for extension officers (and other local people involved in education activities)

Extension officers need to get more training in designing educational activities and use of different educational methods. The exact contents of this training must be based on an evaluation of educational activities of next year.

Evaluation of public education strategy

The public education strategy must be evaluated yearly. In these yearly evaluations should be looked at what has been done and achieved in the last year and how these activities and achievements relate to the public education strategy. On basis of the yearly evaluation the educational strategy can be adjusted to the then current situation and education activities can be incorporated in the Proyek Pesisir workplan for the next year.

Incorporation of education strategy in ICM plans of the villages

The public education strategy is written at the same time as the villages are preparing the development of ICM plans. Although in the public education strategy focuses on the different villages, further adjustment to local situations and more detailed actions that must be taken is necessary. Therefore, the public education strategy must be incorporated in the ICM plans in the villages. In the ICM plans attention must be paid to what educational activities must be part of the management plan. As with the public education strategy the incorporation of education in the ICM plans should be evaluated on a regular basis.

Additional technical assistance in subsequent years of the project

Additional technical assistance is necessary in the following fields:

- * Evaluation and adjustment of public education strategy. The public education strategy must be evaluated and adjusted yearly. Especially in the first (couple of) year(s) technical assistance in this evaluation is necessary. Eventually the environmental education officer will have to coordinate these evaluations, but it cannot be expected that the environmental education officer can do the evaluation independently right away. Therefore it is necessary that a technical assistant visits Proyek Pesisir North Sulawesi on a yearly basis to assist in the evaluation of the public education strategy.
- * Assisting the environmental education officer. The majority of the tasks will be new to the environmental education officer. Therefore, guidance and assistance will be necessary. This assistance can partly be provided from a long distance. Through e-mail contact between the environmental education officer and the technical assistant can be maintained. However, it will be necessary for the technical assistant to visit Proyek Pesisir on a yearly basis to be able to discuss the tasks, problems and challenges more thoroughly with the environmental education officer.
- * Assisting with contracting organizations for the development of formal curriculum on coastal ecology. It is important to make a well thought choice of an organization that can develop formal curriculum on coastal ecology. Furthermore, it is necessary to write a good and clear terms of reference for the contracted organization. In both choosing an organization and writing the terms of reference technical assistance is necessary.
- * Training for extension officers (and other local people involved in education activities). Extension officers and other people involved in education activities should be provided with more background knowledge on designing educational activities and be trained in didactical skills. This training must be taken care of by the technical assistant, in cooperation with the environmental education officer. In the long run the environmental education officer should provide this training to Proyek Pesisir staff and other people involved in educational activities.
- * Workshop on environmental education. In this workshop the focus must be on designing displays for information boards and exhibits for the information centers. People participating in this workshop can be Proyek Pesisir staff and other people involved in designing displays and exhibits.

APPENDIX I

IMPORTANT ASPECTS IN DESIGNING EXHIBITIONS

Building exhibits requires a lot of preparation. In this appendix special points of attention are listed and explained.

Preparation of exhibits

In preparing exhibits, one should ask the questions: “Why do I want to show something?” “What do I want to show?” and, “In which way can I attract people’s attention?” While answering these questions it might turn out that exhibits are not the right means for the purpose.

Exhibits are a perfect example of a means where goal, target group and presentation methods can be well defined. In this appendix, goal, target group and presentation methods are discussed individually, but there certainly are interconnections among them. One can set a great goal, but when the materials are not available, the exhibit will not be realized.

Goal: The majority of exhibitions aim at providing information in a general way. The exhibition builders want to provide the public with a certain message, for instance the benefits of a healthy coastal ecosystem.

Some examples of goals are:

1. Providing information, in a simple way explaining which animals rely on the coral reef ecosystem.
2. Background on a national park or marine sanctuary (e.g. in information centers)
3. Showing developments in the project.
4. Building awareness of situations, features, etceteras.

For example: Consequences of ecotourism; Dependence of humans on natural resources.

Target group: For whom is the exhibition (in particular) meant? The more detailed this group can be defined, the better the exhibits can be adjusted to:

- * Knowledge level
- * Attitude towards the subject
- * Way of learning (which language and pictures can be used best)

When the factors mentioned above are not known or the objective of the exhibition is to reach a wide audience, then it is recommended to use a twelve-year-old as the average target audience. This makes the exhibition usable for large groups and visitors with children. No matter how broad, a profile of the target group should be made to make consequent choices during preparations possible.

Ideas considering use: During preparation, the following questions will also arise:

- * Is the exhibition to be used only once or several times?
- * Is the exhibition adjusted to a certain room or building or should it be adaptable to different locations?
- * Do parts of the exhibition have to be usable for other events?
- * Do the exhibits have to be transportable?

Specifying the issue: Usually people start with a very broad issue. This makes it difficult to provide concrete information and to find suitable pictures and objects for the exhibits.

General subjects are less inviting to people than specific subjects referring to their own life. Compare, for example, degradation of coral reef ecosystems in the world, with declining fish catches of the fishermen in the village because of degraded coral reefs.

Layout of the exhibition: What should the exhibition look like?

It is recommended to design the exhibition on paper first. Starting with a rough outline and adding more details to it over time as ideas get more concrete. Do this designing always with a group of people. To build a successful exhibition, working in a group is a basic condition.

In an exhibition, layout one should also include:

- * A short description of goal and target group
- * A map of the exhibition area.

Methods and means

Methods and means to put an exhibition together will be divided into four categories.

1. Images

The story of the exhibition should be told through a couple of clear images. When long texts are necessary to explain the images, then the exhibits are not good. Images can be:

- * Objects
- * Models, reconstructions (these are attractive means because they are three dimensional)
- * Photos (one good big photo usually is better than ten small ones)
- * Drawings (for example to explain how something works)

2. Texts

The big question is how much and what should be written down. Visitors spend 3/10 of their time reading texts. The further they proceed in the exhibition the less attention they pay to reading. In general it can be stated that people watch in fragments (similar to how people watch television commercials) and that short, varying subjects are attractive.

The need for information is very different for every person. A solution for this problem is dividing the texts into A-, B-, and C-texts, having a different status. Compared with newspapers these are A) the headlines, B) the texts in bold, and, C) the rest of the article.

A-texts: Indicate the story of the exhibition. (for example 10 - 15 cm)

B-texts: Text boxes at every part of the exhibition providing background information to the story. Each box should comprise of between 60 and 100 words.

C-texts: Small, less obvious text boxes in which more detailed information can be given.

3. Objects that can be touched and activating means

It appears that people pay more attention to an exhibition when they are allowed to touch the objects. Activating means are for example items with moving parts (e.g. machines that may be operated by the visitors themselves, experiments that can be executed by visitors). A disadvantage of activating means is that they can divide the attention of the visitors from the actual goal of the exhibition.

4. Extra means

Examples of extra means are brochures of the exhibition in which the exhibition is summarized or extra information on the subject is given. Another example is a questionnaire/worksheet on the

exhibition. This questionnaire/worksheet can be used when schoolchildren visit the exhibition. They have to find the answers to the questions by looking carefully to the exhibition.

Some tips on using the available space:

- * Use the whole room, not only the walls
- * Decide how people should walk through the exhibition. The natural way is to the right. That is how people are used to read (from left to right)
- * Put displays and texts on a fixed height. This height should be on eye level
- * Room, information boards and other objects altogether should form a nice composition

Language use in texts:

Texts should be simple and short, in present tense and without unnecessary words. An example of a text with unnecessary words is: 'It is impossible that birds do not lay their eggs in May.' This sentence provides the same information as: 'Birds lay their eggs in May.'

Layout of texts:

- * Use a simple and clear type of font. Test the readability of this font
- * Do not write full sentences in capitals
- * Make a clear division between headlines, important texts and more detailed information by using different font sizes or different colors
- * A mix of different font types is usually distracting

APPENDIX II

IMPORTANT ASPECTS IN MAKING WORKSHEETS

Worksheets are educational means; to work with them is an educational method. Worksheets appear in many different forms, however, in general it can be stated that:

- * Worksheets are one or two pages of text or figures.
- * Worksheets are an invitation and assistance to observe, experience and explore.
- * People can work independently with worksheets.

Characteristics of worksheets

- a. The one who made the worksheet determines in which way participants are at work with the topic
Depending on the openness of the questions, participants' observations are to a certain extent guided in a certain direction. Open questions (e.g. What do you see?) give room to individual observation, while less open questions already guide observations towards a certain direction. An ideal worksheet both gives enough guidance and leaves enough room for individual observations. The balance between guidance and freedom is dependent on age, experience, knowledge of the area and personality.
- b. A worksheet is only an instrument
This means that filling in the worksheet is not the goal on its own. It is not the answer to the question that is important, but the activity necessary to be able to find the answer. Although worksheets sometimes look like stand alone materials there should always be an introduction or follow up to the worksheet. Worksheets should be part of a greater activity.
- c. Worksheets are ready to use materials
However, when copying worksheets from someone or somewhere else, it should always be checked whether the work sheets meet your standards and are useable in your situation.
- d. Worksheets can invite users to explore, interpret and/or understand things
These three aspects might all be present in one worksheet, however, these are three different things. The assignments on the worksheet can have the following purposes:
 - * Observe/explore. Discover variations.
 - * Investigate the results of action.
 - * Gather and order data.
 - * Synthesize observations. Discover interrelationships.

Worksheets can be used in different stages of the learning process

At the beginning

The goal is to structure observations of the group so that the gathered data and materials can be used in a follow up activity.

As deepening

After an introduction participants can use worksheets to further investigate or explore the things discussed in the introduction.

At the end

To apply information in practice or to look at a matter in real life.

During the whole learning process

From the beginning to the end of the learning activity every once in a while, an assignment on the worksheet is done. The assignments on the worksheets are considered support, variation to listening and reading, and a good way to summarize what has been learned.

Because the assignments are written down, worksheets are suitable:

- * for big groups;
- * to be used repeatedly;
- * as support to a teacher or guide who still wants to be able to help individual groups whenever necessary;
- * as a temptation to get people to do assignments. A nice worksheet is tempting.

Because people can work with worksheets independently, worksheets are suitable:

- * for activating participants;
- * for stimulating independence;
- * to let everyone work at their own pace.

DIFFERENT FORMS OF WORKSHEETS

The term worksheet leaves room for many different forms because there is no consensus on what exactly a worksheet is. Furthermore, there exist a lot of different worksheets. Worksheets do look alike, but different forms can be recognized. Here, attention is paid to differences based on the openness of the questions and form in which assignments and answers have to be processed.

Closed and open assignments

Closed assignments are suitable for:

- * directing observations to certain aspects;
- * collecting research data that can be used to draw conclusions;
- * stimulating a group with little initiative caused by the group not feeling at home or having a lack of knowledge or experience.

Open assignments are suitable for:

- * getting as many personal impressions as possible;
- * using the worksheet at many different locations, and, if necessary, with different explanations;
- * letting a group that is willing to work, work independently.

The way in which answers should be provided

1. Description of the assignment

This is basically a list of questions and guidelines that can be used when observing an object, landscape, and so on. It is not necessary to write down the answers to the questions. The way in which the results must be presented is usually written on the worksheet (e.g. presentation, drawings).

This kind of worksheet can be used when the group is motivated to observe and make notes, and has enough knowledge and skills to work independently. However, for children, this form is probably too open. They will ask: But aren't we supposed to fill in something?

2. Question and answer sheets

The whole activity is conducted through small steps (those are the questions). Answers to the questions can, for example, be written down or drawn. Or a separate answer sheet can be made.

Writing down the answers adds structure to the learning process. Furthermore children usually consider filling in the answers being a fun thing to do. When they have finished the activity they have a personal result in the answers to the questions. This result can be used in follow up activities.

When working with young children, the questions can be read out loud. The children can give the answers to the questions without having to fill in the answers themselves.

A good alternative to question and answer sheets are assignment cards. The assignment cards are in essence the questions from the worksheet divided into different cards. These cards can either be used in the same order as the question on the worksheet or they can be mixed.

Some specific, adjusted forms of question and answer sheets are:

* Maps and the empty landscape.

Participants have to fill in their own observations (e.g. free interpretation, focused on birds, garbage, colors, and so on) on a map or simple drawing of a certain area. On the map only rough outlines of basic structure (trees, ocean, beach) are drawn.

* Look/seek sheets

On look/seek sheets pictures of common animals and plants in a certain area are drawn. Young children, for whom filling in of worksheets might be difficult, can indicate on the look/seek sheet which organisms they have found in the area.

HOW TO MAKE WORKSHEETS

The role of worksheets in the totality of all activities is important. Not only should the topic be clear, but also in which phase of the process will the worksheets be used.

This is related to:

- * How does the maker of the worksheet or teacher have to introduce the worksheet, or process the outcomes.
- * The objective of the worksheet.

Several examples of objectives of worksheets are:

- * looking closely to a plant, which means to all details of the plant;
- * practicing different ways to measure the height of a tree;
- * looking for and describing four different crabs;
- * observing birds: their appearance and behavior;
- * and so on.

It is always important to keep in mind who the target group is. The worksheet should be adjusted to age, knowledge and interest of the target group.

When topic, objectives and target group are clear, one can start thinking of questions.

Coming up with the right questions

It is extremely important how the question is stated. “Can you see its head?” is a completely different question from, “Does it have a head?” There is an incredible number of questions of which none is necessarily bad. As long as you keep in mind what you want to achieve and which are the desired answers.

To illustrate the different kind of questions that can be used, the following is a list of questions on snails.

- * Does it have paws? (1)
- * Write down its name when you know it. Or give it a suitable name. (2)
- * What happens when you put the snail on your warm hand? (3)
- * What do you see when you put the snail on a slate? (4)
- * Make a drawing of the snail. (5)
- * Draw the snails antennae in this picture. (6)
- * What do snails eat? (7)
- * Do you see more snails in this area? (8)
- * How many snail species can you name? (9)
- * Why does a snail sometimes retract himself into his shell? (10)
- * Would you like to be a snail? Why yes, why not? (11)
- * What would you do if snails ate all the vegetables in your garden? (12)
- * I think a snail does/does not like being in the sunlight, because ... (13)
- * What is the snail doing right now? (14)

These questions can be divided into several categories:

1. Knowledge, action and think questions

Knowledge questions

(7) and (9) are questions to test knowledge. The question about what a snail eats can also be asked through an:

Observation question: Do you see a snail eating? What is it eating?

Reference question: What do snails eat? Look it up in an encyclopedia.

Action questions

One of the objectives of worksheets is getting people started. In that case action questions are very suitable. The observed objects can provide the answer to the questions. Different action questions can be distinguished as follows:

Action questions

Result

What-questions

What does it do?

What is it made of?

What do you see, smell, feel?

What is happening?

How much-questions

How high, thick, big, etcetera

Comparison-questions

How much more?

How much different, how corresponding?

What happens if

..... I touch the spider's web?

Exploring research

Results in measuring, weighing, better observations; also suitable to practice skills

Qualitative, quantitative; leads to categorizing

Think questions

Think questions are focused on explaining and arguing features. These questions can be subdivided into: "How come that?" and "Why do you think that?"

2. Room for individual fantasy, opinion and interpretation

Examples of such questions are (2), (11) and (12). Not every person equally likes this kind of question. Very open questions, such as, "What is your opinion on that?" should not be dominant. These questions should be mixed with more concrete, controllable questions. Examples of these questions are (3), (4) and (6).

3. Questions on different levels of observation

What is meant here is at what scale a context is used for the observations, such as (a) observation of an organism, (b) details of the organism, (c) the organism in its environment or an even wider area. Examples of questions on different levels are (14) (organism), (6) (detail of the organism) and (8) (organism and its environment).

4. The way in which the questions should be answered

- * completing a sentence;
- * choosing an answer from different possibilities;
- * filling in of a drawing;
- * adding colors to a drawing;
- * copying something;
- * filling in of a diagram;
- * using photos.

5. Questions focusing on interrelationships and backgrounds

Questions relating:

- * an organism and its environment: temperature, light, humidity, etcetera (examples (3) and (13));
- * shape and function (example (10));
- * relations between species.

6. Variation in sorts of questions, variation in activities

- * not only emphasizing looking, but also, listening, smelling, tasting, feeling, measuring, counting, estimating, comparing;

- * using your body, seeking, collecting, identifying, doing research;
- * explaining and arguing, being creative, experiencing nature.

A great variation in questions also makes a worksheet more difficult. It is important to limit the variety of activities necessary for answering one question. This can be confusing, especially for children.

CHECKLIST OF IMPORTANT ASPECTS IN MAKING GOOD WORKSHEETS

1. Contents

- a. Are the different parts of the worksheet well chosen?
 - * Are they interesting for participants?
 - * Are the contents adjusted to the objective of the worksheet?
- b. How is the build up of the worksheet?
 - * Is it built up logically and in clear parts?
 - * Is the number of parts not too big or too small?
- c. Are the contents variable enough?
Is attention being paid to observations on different levels and are interrelationships being discussed?

2. Style of the worksheet

- a. Is there a certain style (e.g. structured or not)?
- b. Is the worksheet adjusted to the target group?
- c. Is the guidance in the worksheet pleasant?

3. Room for participants to do, explore and think

- a. Does the worksheet provide participants with possibilities to explore and think themselves, or are the answers already hidden in the questions?
- b. Do the questions and assignments initiate:
 - * exploring the own environment;
 - * stimulating fantasy and expressing ones own opinion;
 - * looking for solutions.
- c. Do the questions and assignments give room for using several different senses?
- d. Does the worksheet not obstruct peoples own experiences?

4. Technical aspects of the worksheet

- a. Is there a clear distinction between the questions and informative texts?
- b. Is the language used clear?
 - * Are the sentences short and simple?
 - * Are the assignments clear (what must be done, where should it take place, which materials) are necessary)?
- c. Design and layout of the worksheet.

- * Is a clear layout used?
- * Is the spacing of the text wide enough?
- * Is there enough space to fill in the answers?
- * Is the worksheet attractive?

d. How are pictures used?

5. Organizing aspects

a. Is the worksheet part of a larger whole?

b. Are participants well informed on:

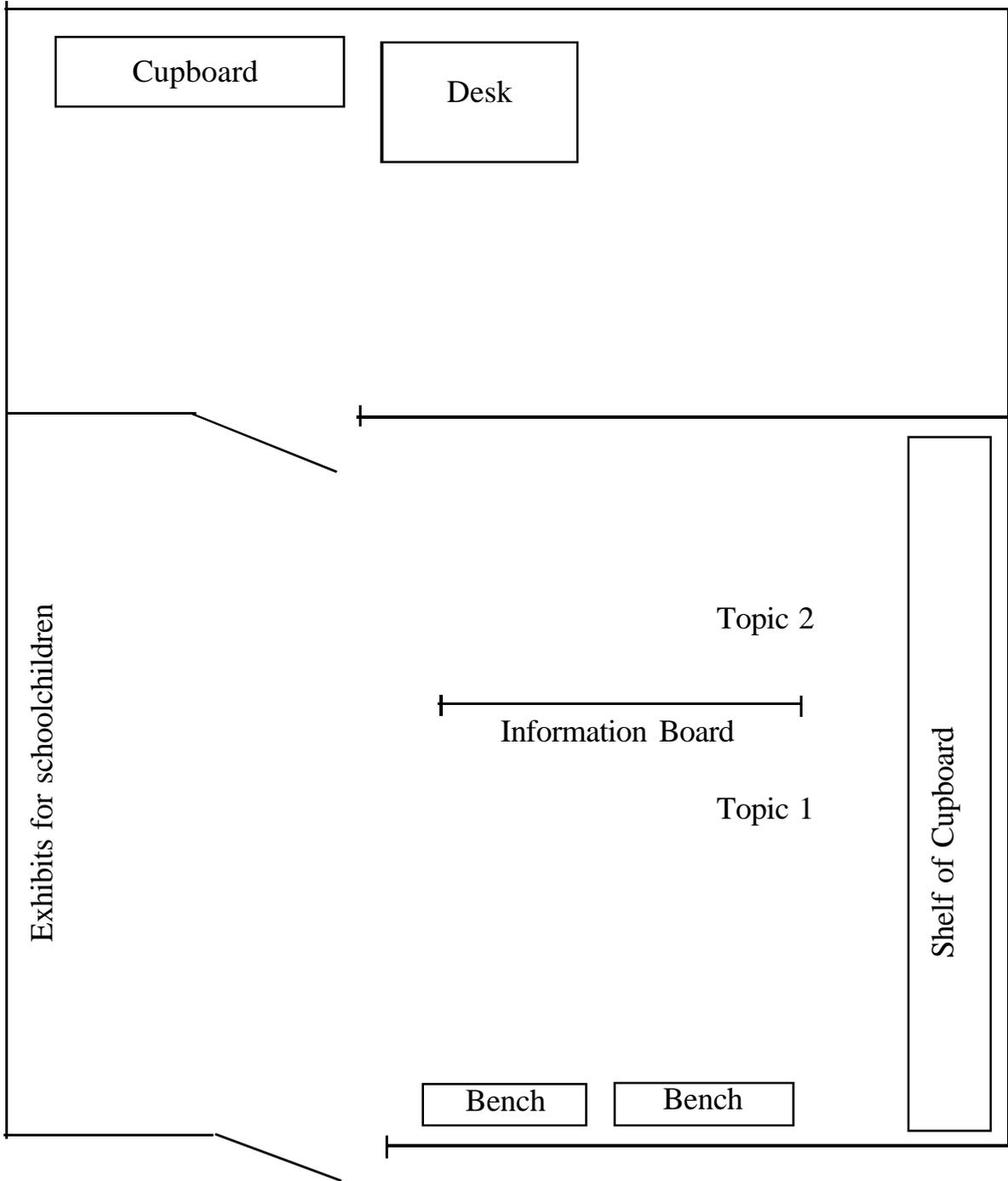
- * objective of worksheet;
- * procedure;
- * follow up;
- * arrangement of time;
- * what to do after finishing.

c. Will the work be done individually or in groups? Does this match the assignments? Does every member of a group have a task?

d. Are the necessary materials available?

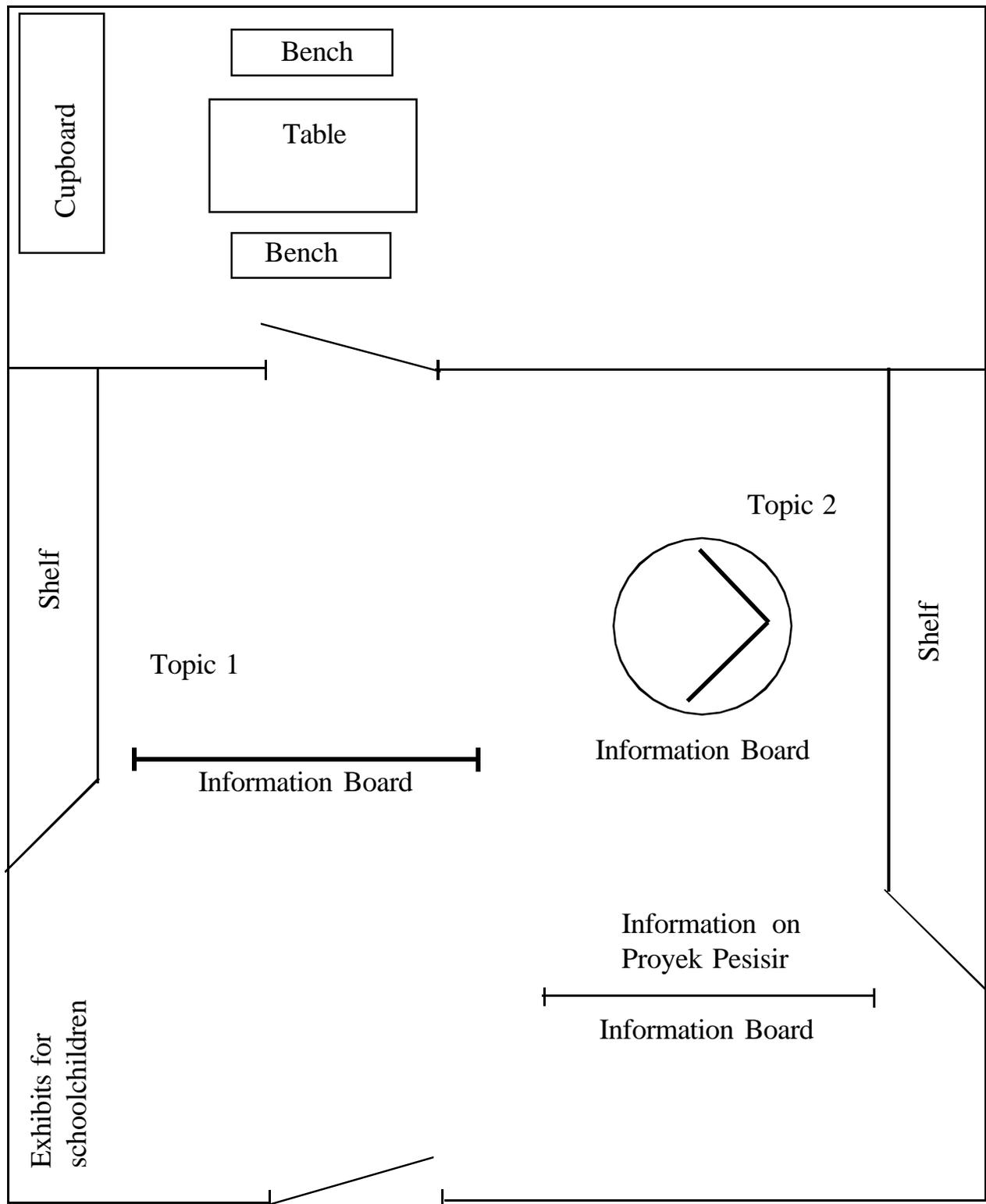
APPENDIX III

INFORMATION CENTER BLONGKO

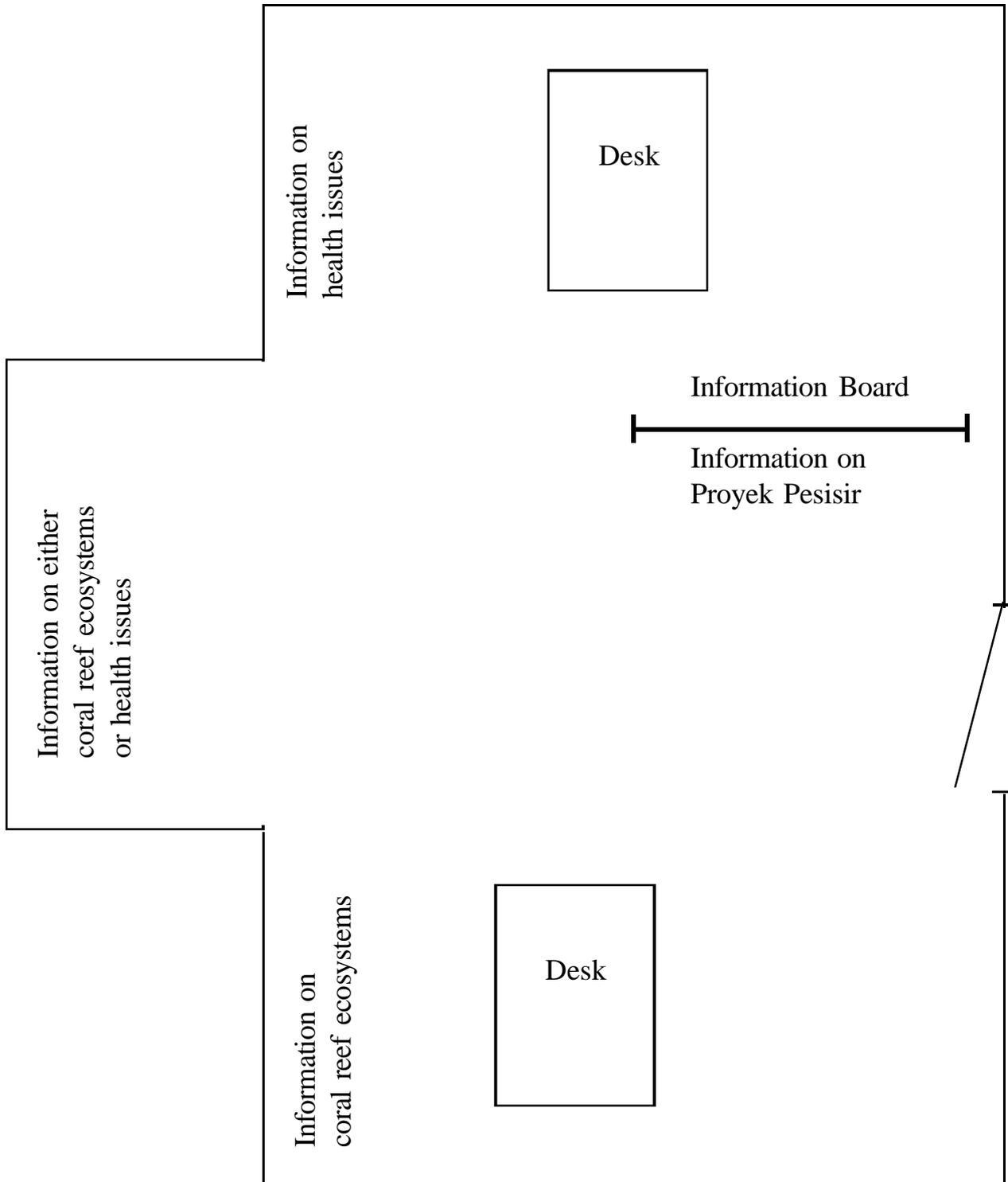


APPENDIX III

INFORMATION CENTER BENTENAN



SMALL INFORMATION CENTER TUMBAK



INFORMATION CENTER TALISE

