T6123-REG
Promoting Effective Water Management Policies and Practices (Phase 3)

Pilot Demonstration Activity of Developing and Testing Environmental Education and Awareness Methodologies and Tools

Environmental Issues in the Tonle Sap: A Rapid Assessment of Perceptions

Tonle Sap – Cambodia
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CONTENTS

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Abbreviations

ADB	Asian Development Bank
CBTS	Capacity Building in the Tonle Sap
CFDS	Cambodian Family Development Services
DOE	Department of Environment
EE	Environmental Education
EE&A	Environmental Education & Awareness
FAO	Food & Agriculture Organization of the United Nations
GEF	Global Environment Facility
LLEE	Live & Learn Environmental Education
MOEYS	Ministry of Education Youth and Sports
NMRC	National Mekong River Committee
NGO	Non Governmental Organization
NRM	Natural Resource Management
PDA	Pilot Demonstration Activity
RAP	Rapid Assessment of Perceptions
TCU	Technical Coordination Unit, Ministry of Environment
TSBR	Tonle Sap Biosphere Reserve
TSBS	Tonle Sap Basin Strategy
TSEMP	Tonle Sap Environmental Management Project
UNDP	United Nations Development Program
UNECSO	United Nations Educational, Scientific & Cultural Organization
WAP	Water Awareness Program
WCS	Wildlife Conservation Society

EXECUTIVE SUMMARY

Aim of the RAP

1. This report was identified as being necessary to provide a rapid insight into community perceptions of their situation in relation to water issues, and perceptions of how water impacts on their livelihoods. The research is intended to guide the identification, nature and context for suitable environmental education tools to implement the Pilot Development Activity (PDA) in the form of a Water Awareness Program (WAP). The tools chosen will be based on the communities' existing knowledge base and perceptions (the RAP) along with a review of existing approaches to environmental education, curriculum frameworks and resources. This research also forms the base-line for the final evaluation of the PDA.

2. A range of findings emerged from the research that will assist with identification of appropriate tools and methodologies for the RAP and suggestions for the TSBS.

Summary of Key Findings

3. The RAP found that communities are not deficient in environmental knowledge. Most communities have a good to comprehensive level of environmental knowledge but are unable to make use of it because they lack of access to the power and economic incentives to make change happen.

4. Cambodia is confronted with having to manage – or "mismanage" the ever-increasing problem of depleting flooded forest & fish resources as well as polluted water. Water pollution poses public health and environmental hazards, leading to a marked deterioration of livelihoods. The research showed that values differ among individuals and groups of individuals in attitudes toward having a clean environment around the Tonle Sap. Success in working together is underpinned by acknowledging the diversity of attitudes and values.

5. The communities researched are most concerned about the visual pollution of the Tonle Sap particularly around their houses. They perceive that this pollution diminishes their fishing income whilst also impacting on their general health.

6. Leaders, youth and men's focus groups within communities perceive themselves as individuals and as a community to have the most say about environmental decisions because of their proximity to environmental issues. Youth and men's groups rank the government and district officials to have little actual influence over making decisions about the environment around their communities. Conversely decision makers in the research communities rank the government and district officials in higher regard. This feeling of ownership among many community members may provide a good driver for the PDA to empower and motivate change from the community level.

7. Given the state of livelihoods in the research communities, the traditional Environmental Education paradigm that seeks a linear addition of awareness, knowledge, attitudes and skills in order to have sustainable actions, needs to be reassessed in the TSBR context. From the information recovered and lessons learnt, the progression should be viewed as cyclical. It seems community Environmental Education tools need to be action-oriented, whilst the other usually linear progressive elements (knowledge, attitudes, & values) need to built-in so they occur simultaneously to the action. In this way benefits will be seen directly.

8. Organizations engaged in EE&A initiatives recognize the value of environmental knowledge for development and also the value of inter-organizational cooperation and collaboration in developing EE tools and training. They are supportive of the PDA especially if it can begin a process of streamlining EE modules into formal school curricula. The RAP also identified some areas where EE can be strengthened through:

    - building capacity for real implementation of EE by trained teachers,
    - cultivating domestic expertise in participative EE facilitation techniques,
    - promoting a collaborative focus on local needs,
    - committing centers to community involvement,
    - engagement with traditional knowledge, and
    - promotion of individual and community reflective activities.

9. Sustainable development issues are rarely facilitated effectively in the Tonle Sap Region, and as such is one of the major challenges to environmental education in Cambodia, as are the pedagogic challenges and social dilemmas involved with critical thought.

10. A delicate balance exists between individuals challenging inequities as an outcome of environmental education with the need to respect long-standing cultural norms and expectations. This is coupled with the danger of increasing community and student feeling of responsibility for the environment that is not matched by increased empowerment.

11. Bureaucratic obstacles and inertia, characterized by decisions invariably being referred upwards rather than delegated, restrict change. The chances of long-term systemic improvement, supported by political will are poor, and further compounded by temptations of forms of corruption (a standard method to augment an otherwise low salary).

12. Institutional segmentation and isolation of responsibility for Environmental Education is a problem. Cambodia has the Department of Agriculture, Forestry and Fisheries, Department of Environment and the Ministry of Education Youth and Sports (MOEYS) all of which are somewhat active with respect to Environmental Education but at this stage they are not harmonized in approach or delivery.

13. The meaning of 'Environmental Education' varies across delivery organizations and should be expected to evolve over time. A shared acceptance of the different concepts between stakeholders is required to identify commonalities to open up dialogue. Diversity needs to be seen as an opportunity rather than weakness.

14. Given the variety of meanings attached to the term in general usage and the proliferation of terminology relating to Environmental Education, the PDA may not necessarily be identified as a productive, action-oriented project when using this term to find common ground with other organizations and individuals. Such organizations and individuals should be made aware that Environmental Education is concerned for the following:

    - enhancement of economic capabilities or opportunities and the sustainable use of natural resources,
    - improvement of practice in curriculum development and educational participation rates,
    - development of opportunities for, and skills of, participation in civil society,
    - provision of basic services to local communities, and
    - facilitating the recognition and utilization of traditional skills and practices.

15. Mainstreamed Environmental Education in formal education faces many institutional and economic constraints. The Ministry of Education Youth and Sports is not opposed to Environmental Education, but is expected to be reluctant to divert resources to it unless it is seen to offer a cost-effective way of achieving priority educational objectives. The current education policy embraces the theme of the 'Child Friendly School Initiative'. The opportunity exists to be able to establish a well functioning tool that integrates itself into this theme. An opportunity exists to work with the Pedagogical Research Department at MOEYS to foster more participative methodologies. The existence of the cluster school system adds to the accessibility of teachers to support each other in the context of new teaching methodologies based on action learning.

16. Environmental Education materials look good on paper, but teachers are not necessarily employing them in classrooms. There is a need to build capacity for more effective and wide spread implementation through master teachers and teacher training colleges. Teachers need incentives for employing Environmental Education in their teaching following training. Currently, financial incentives are offered for Environmental Education to be taught as a separate subject. Incentives alternate to cash should involve the support and recognition of Environmental Education by Education Policy objectives. What is more, Environmental Education teaching strategies must tally with teachers' perceptions of their own needs and capabilities. Effective teacher inclusion of Environmental Education involves strategies for

innovative design, motivation and most importantly, personal and community reward. Innovative incentives should give a sense of empowerment that their situation (quality of life) will improve through participation.

17. Environmental Education along sustainability themes, commonly referred to as education for sustainability, education for sustainable development or simply in this case, all embraced by the term Environmental Education, can be a key tool for educational reform in the longer-term. This comes as Environmental Education can provide synergy between subjects that have been historically and unproductively separated. Environmental Education offers an efficient educational approach that exemplifies and develops linkages between local, social, cultural, environmental and historical themes.

18. The quality, commitment and accountability of teachers are seriously affected by factors such as remuneration. Teacher absenteeism is quite high and is seen as the result of both poor pay and relatively low status of teaching as a career in Cambodia.

19. Education that creates greater demand and incentive for parents to have their children attend school is essential. Formal education will be more valued if it improves capability to participate in civil society and the labor market. Where Environmental Education can be linked to the enhancement of economic opportunity it may increase the probability that children will be sent to school. Quality Environmental Education integrates work in schools with non-formal education in such a way to be both consistent and contemporaneous learning-in-the-community and continuous with learning that occurs later in life.

20. Knowledge seeking and sharing is not always a culturally valued activity in communities in the TSBR. Therefore building a knowledge based natural resource management tool for communities is bound to face enormous challenges unless it demonstrates its value through short-term tangible outcomes.

21. Collective action in environmental knowledge domains is low to non-existent in TSBR communities. Knowledge creation, where is exists, is perceived as a formal teacher-expert-led enterprise and not as a collaborative social process. Collective action needs to be nurtured in schools through collaboration with environmental knowledge organizations and institution to ‘localize environmental knowledge’ to enable higher levels of community action and traditional knowledge sharing.

Recommendations for the PDA

22. When examining the nature of linkages between Environmental Education and poverty eradication in the TSBR, it was found that Environmental Education is contextually appropriate however its method of delivery is dependent on the prioritization of immediate and long term needs identified by the communities. Environmental Education must do more than inform communities about long-term benefits of environmental preservation. It must show that environmental assets can provide a stream of income both in the present as well as the future. Environmental education and poverty eradication are linked by the issue of need. For the most poverty-stricken, if the generation of an income stream provides no alternative than to involve environmental degradation, then that degradation must be tolerated, since the choice at the margin is worse.

23. It is important that where Environmental Education promotes good resource management, environmental outcomes are not separated from their social and economic consequences. For example, the creation of a Tonle Sap conservation park may be a sound conservation move, however it may serve to alienate fisher-folk, even where the intention is to improve stocks and catches over time. The change must be wanted and perceived by the community and provide some built-in immediate as well as long-term benefits.

24. Catalytic environmental behavior change will only ensue if Environmental Education tools and activities do not create an extra activity to everyday tasks that are generally primarily focused on income generation from fishing. In poorest homes this includes income generation from fishing, to provide day to day meals.

25. The TSBS and the PDA might consider promoting their strategic goals by exploring innovative ways to access, disseminate and further develop existing knowledge within particular areas of Environmental Education. These may include community and parental involvement, changes in pedagogical practice, use and recognition of traditional knowledge and culture, religious influence, empowerment and equality in participation.

26. Teachers' pedagogies are affected more by the examination system than the curriculum. In its early stages, mainstreaming Environmental Education needs to focus on enhancing teachers' pedagogic practices within existing curriculum and assessment frameworks, particularly in relation to using the local environment as a learning resource. In the longer term concomitant change in the assessment system should be maintained alongside curriculum and pedagogic change, particularly in assessing the more analytical skills taught in areas that involve a more social and economic emphasis.

27. Collective action needs to be nurtured in schools through collaboration with environmental knowledge organizations and institutions to 'localize environmental knowledge'. This would enable higher levels of community action and traditional knowledge sharing.

28. Environmental education's appeal to a multiplicity of disciplines reflects its relevance to local needs and concerns. Using the PDA and the TSBS to promote the mainstreaming of Environmental Education could offer:

    - a pedagogy which is responsive to Tonle Sap geographical, economic, religious and social needs,
    - a possible way of integrating and engaging traditional ecological knowledge into the curriculum,
    - a focus on the learner, the school, and the community and,
    - relevance to environmental health issues.

29. The need for Environmental Education for Cambodia is written into many regional and international frameworks. The ASEAN framework in particular should be used to assist the PDA and additionally, in informing the TSBS.

Scope for Innovative Tools

30. The PDA should consider focusing on utilizing individual champions and change agents within each Kompong or Province. Individuals who are locally respected may have a key role in building the capacity of others. Groups where individual change agents may be drawn include Pagodas, Khmer traditional singers and village elders.

31. Women are the head of many households and as such have a primary role of environmental management in their household. They reported that they would be more likely to alter their practices if they are able to identify with a female role model.

32. Religion plays a major part in daily life and in the formation of individual attitudes towards key issues such as education, health and the environment. Buddhism can point to an appreciation of the world's resources as a fundamental tenet of its faith. The role of Pagodas have considerable potential in supporting environmental education through linking it to people's spiritual learning and their sense of relationship with the environment. Pagodas hold much educational and spiritual influence especially in rural communities. Some environmental educative organizations are currently beginning to integrate Pagodas into their outreach training.

33. There are very few opportunities for communities to make themselves heard in civil society concerning environmental management issues. There may be an opportunity for tools to link the means of participation in civil society (e.g. literacy) to its purpose.

However there is danger of increasing community feelings of responsibility for the environment that is not matched by increased empowerment by those currently holding the power.

34. Communities are very keen to engage in tools such as call-in radio shows and educative drama as entertainment, coupled or in support of a more action oriented activity.

35. Common to all five research communities is the belief that environmental education, if action-based, can play a role in poverty alleviation through:

    - participative improved waste disposal initiatives,
    - planting and regeneration of flooded forest tree species, and
    - general education on nature conservation through a variety of techniques.

Lessons Learnt

36. It appears that no in-depth impact evaluations have been conducted of existing Environmental Educative activities around the TSBR. Success, if measured, is often measured by the number of materials developed or trainings conducted, which are not indicators of true impact on knowledge, skills and action competencies. It would seem appropriate that such a review is conducted before new tools are introduced. If the TSBS is to guide future Environmental Education in the TSBR, the TSEMP first needs to document what works. The lessons learnt to date suggest that the delivery of Environmental Education needs redirection to more participative social models.

37. Education and people's ability to advocate for change is embedded in a past bequeathed by the previous Pol Pot regime leaving many people with little desire to trust government bodies or be part of activities where individuals stand out from others in the community.

38. Mechanisms for sharing good practice in Environmental Education tools and methodologies and adapting it for local needs are highly underdeveloped in Cambodia.

39. Although education is a major aspect for many of the TSEMP components, Environmental Education is rarely seen as a viable priority or major strategy option.

40. Most in-country research assistants are not familiar with the discipline of collecting existing information and the concept whereby the process of dialogue is just as important, if not more so, than the actual outcome. They have a tendency to want to

educate instead of observing what exists. This finding can be attributed to the local educative system whereby synthetic skills are not yet highly valued or nurtured.

41. Interactive activities and visual aids are valuable tools in awakening thought and asking individuals and groups to justify value stances on the environment and interlinked economic and social issues in a non-threatening atmosphere.

42. Communities are willing to participate in the social research for the PDA although future hindrances may ensue through the expectation of cash for participation, turning development projects into a micro-business/enterprise in some communities. This is cause for concern and alternate incentives for involvement should be considered.

PART I

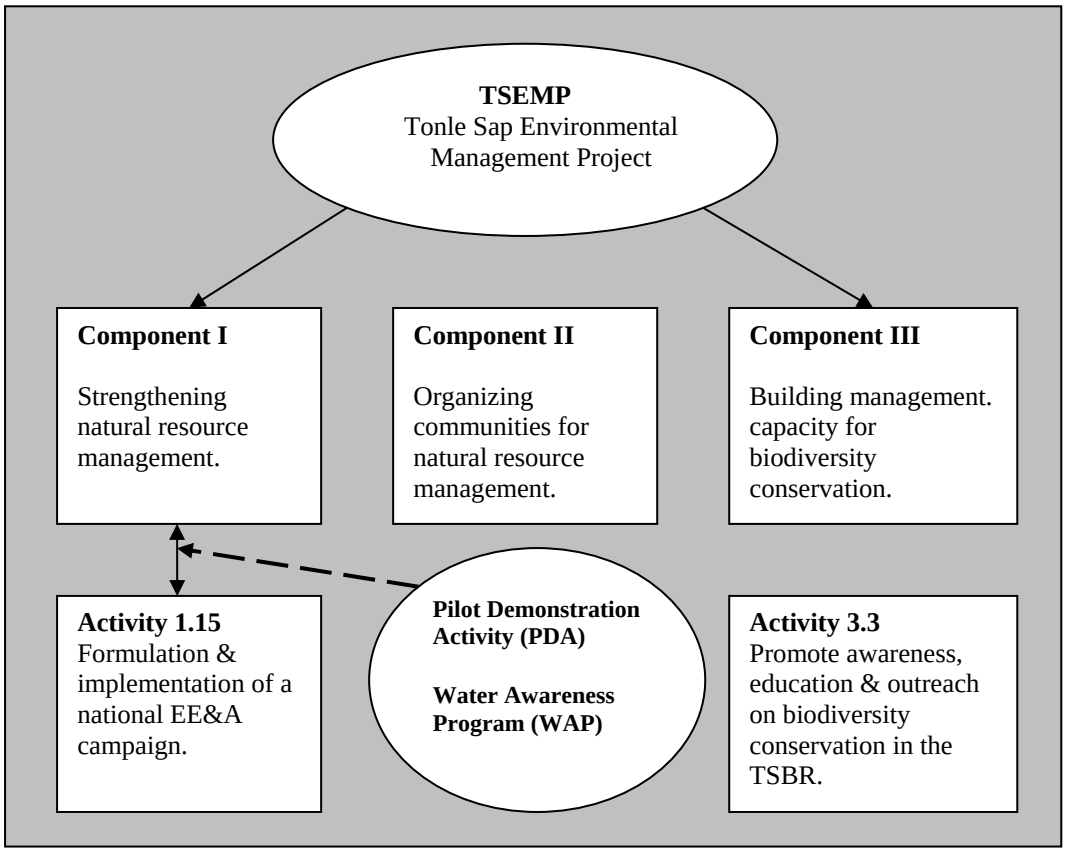
INTRODUCTION

Background to the Pilot Demonstration Activity (PDA)

43. This rapid assessment of perceptions (RAP) was conducted during July and August 2004 in support of the Pilot Demonstration Activity (PDA). The PDA falls under the broader Tonle Sap Environmental Management Project (TSEMP) co-financed by ADB, GEF, Capacity 21, WCS, and the Royal Government of Cambodia.

44. Underlying the TSEMP are three main components: (I) strengthening natural resource management, (II) organizing communities of natural resource management, and (III) building management capacity for biodiversity conservation. The PDA links with activities that fall under the TSEMP components I and III. Formally, the PDA links with Component I under Activity 1.15, the formulation and implementation of a national environmental education campaign. Informally, the PDA links with Component III of The Tonle Sap Conservation Project in which Activity 3.3 aims to promote awareness, education, and outreach on biodiversity conservation in the TSBR. These relationships are illustrated below.

Illustration 1. The PDA in the context of the TSEMP



45. The Tonle Sap Basin Strategy (TSBS) has identified the Pilot Demonstration Activity, in the form of Water Awareness Program (WAP), as a vehicle to showcase Tonle Sap initiative activities as they progress, especially in the area of EE&A methodologies

and tools that stimulate critical thinking and local community ownership of community problems associated with water. The experiences gained from the PDA will support the identification of tools and methodologies for a national EE&A Campaign.

The Need for a Rapid Assessment of Perceptions (RAP)

46. For the PDA and environmental education to be successful it needed to be informed by a rapid assessment of stakeholder perceptions on water related issues. The RAP employed a data collection methodology (Refer to Annex 3) that was highly participative. Through utilizing interactive pictures and ranking cards as well as focused discussion, data was collected on community members' perceptions of environmental issues, opportunities for action, comprehension of social/environmental linkages, ability for futures thinking, and perceptions of who makes decisions about the environment, along with ideas of what tools the community would like to be part of a national EE&A campaign.

47. Ideally, an assessment of perceptions should entail a thorough and comprehensive exploration and analysis of all stakeholder perceptions, issues and options. Practically, and as a result of time constraints, this was not feasible. Consequently this report presents the results of a rapid assessment within in the scope of the proposed PDA. The objective of the RAP was to provide an analysis of the main factors and variables in people's perceptions which must be taken into consideration in the design and development of forthcoming EE tools and methodologies in the development of a viable and effective PDA.

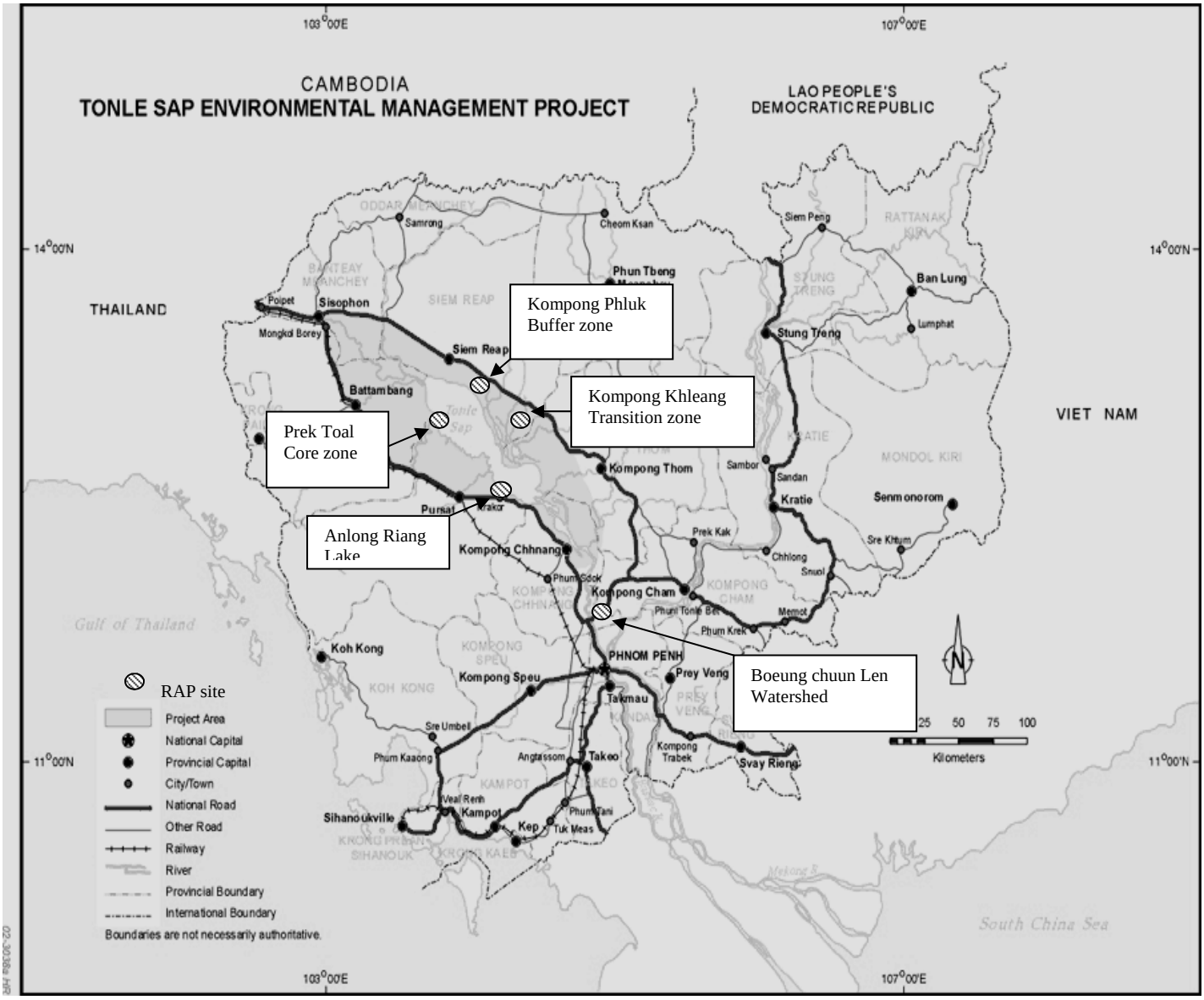
48. During the first week of August a Khmer male with an environmental degree was trained in community research facilitation techniques and methods applicable to having a successful and consistent RAP methodology. The RAP was then carried out in 5 communities with a total of 151 community focus group participants with 6-8 participants in each focus group to allow true participation. The RAP was able to gain an insight into community perceptions on water related issues and how such issues inhibit poverty reduction.

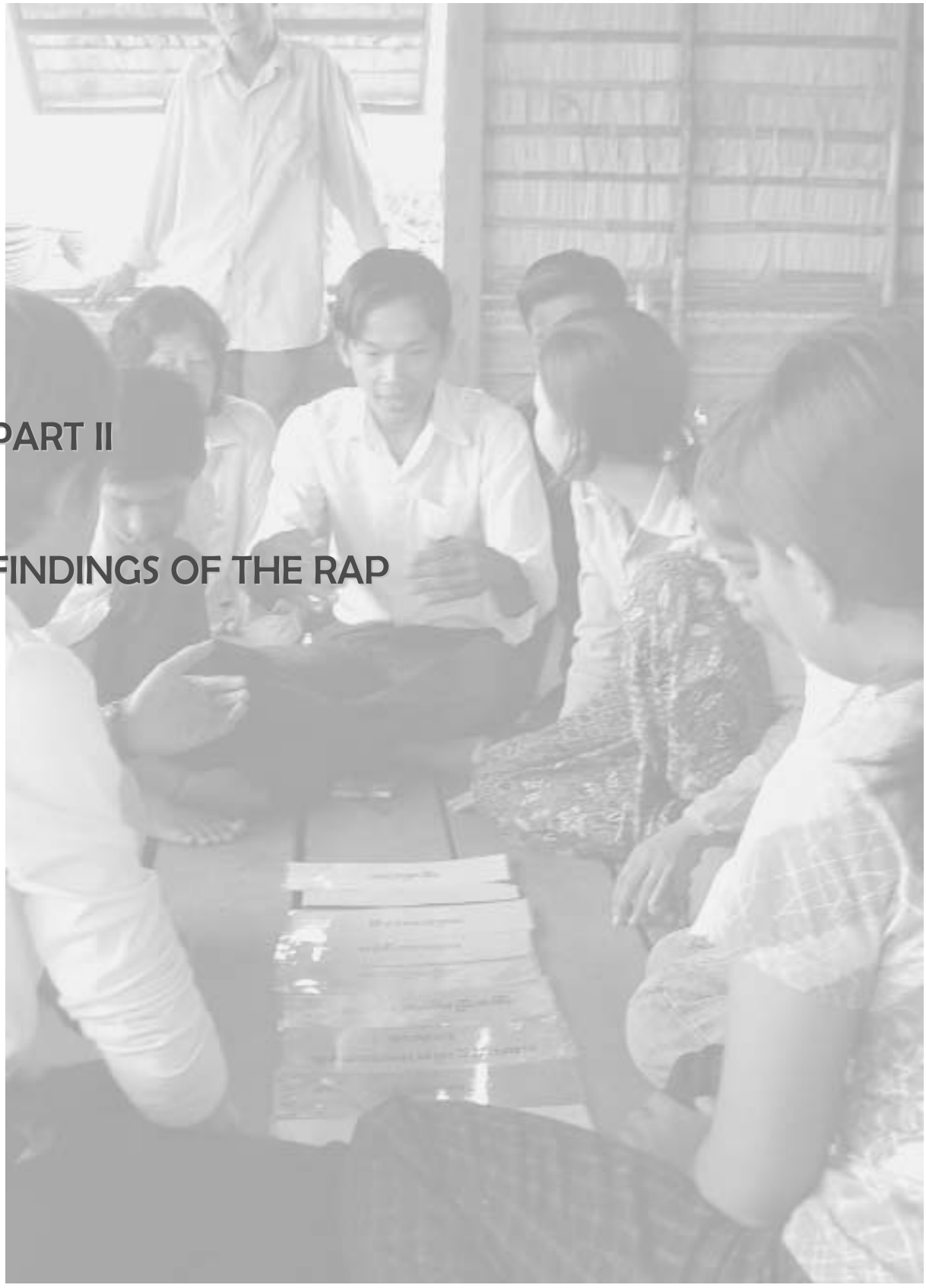
49. In addition to these community sites, environmental education practitioners who run EE programs and work along side the formal education system took part in informal interviews.

Below: The five communities representative of the different zones of the Tonle Sap Region were selected to be research focal sites. One community acted as a pre-test community. Note that at the time of the RAP four out of the five communities were only accessible by boat (Refer to Annex 1 for community profiles).

Community	Province	TSBR Zonation	Assisting Organization
Anlong Raing (pre-test community)	Pursat Province	Lake	CFDS
Kompong Khleang	Siem Reap Province	Transition Zone	World Fish Centre
Prek Toal	Battambang Province	Core Zone	Osmose
Kompong Phluk	Siem Reap Province	Buffer Zone	FAO Siem Reap
Boeung chhun Len	Kandal Province	Watershed	National Mekong River Committee

Map of the Community Research Sites in the Tonle Sap Biosphere Reserve





PART II

FINDINGS OF THE RAP

Summary of Community RAP Findings

50. Communities perceive the most visible water contaminants as being the ones for most concern as these are the issues they see everyday.

51. 100% of focus group community members perceived water related issues to affect their livelihoods most directly through a loss in fishing income. A further 90% of groups saw their livelihood affected through health problems related to water-borne diseases stemming from water pollution.

52. The RAP found that communities are not deficient in environmental knowledge. In fact, most communities were found to have a good to comprehensive level of environmental knowledge but were unable to make use of it because of their lack of access to the power and economic incentive to make the changes happen.

53. It is interesting to note that in all communities youth had the highest or equal highest understanding and identification of environmental and social linkages.

54. Groups varied widely in their capacity for futures thinking. Community groups' ability for futures thinking closely followed the trends in community comprehension of environmental and social linkages.

55. In their perceptions of the order of who holds most governance over the environment many groups said their chosen order of ranking was related to the proximity different people had to environmental problems. Consequently community members and leaders ranked very highly and government officials ranked lowly.

56. Common to all five research communities is the belief that environmental education, if action-based, can play a role in poverty alleviation through:

    - participative improved waste disposal initiatives,
    - planting and regeneration of flooded forest tree species, and
    - general education on nature conservation through a variety of techniques.

57. The results of the community RAP demonstrate that communities are in need of processes and power that can infuse existing environmental information, knowledge and awareness into action.

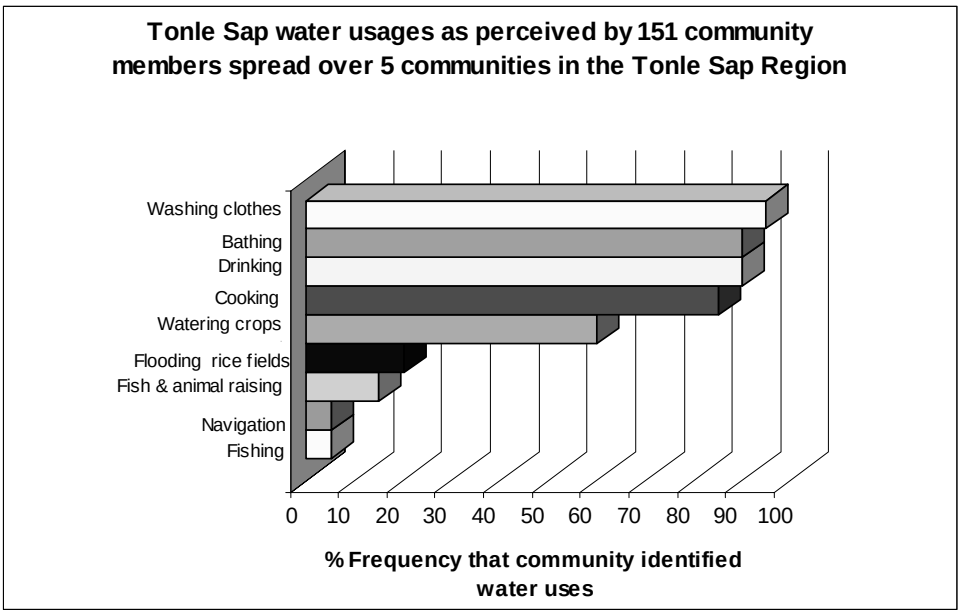
58. Given the commonality of community perceptions collected from all locations it was decided that since there was little variation in response from most of the groups, they would be grouped together and any notable differences will be commented upon in text. The RAP research methodology can be found in Annex 3.

Community RAP Findings

Communities' Perceptions of Water Usage

59. During the RAP it was important to gather basic information such as people's perceptions water usage. To this end, in each of the focus groups, an entry discussion inquired how community members use water from the Tonle Sap. Nearly all focus groups responded that they use water for washing clothes (95% of focus groups), bathing (90%), drinking (90%) and cooking (85%). In communities where many of the participants were farmers they also added that water was used for watering crops (20% of focus groups) and for pumping to flood rice fields (20%). Although each of the communities in the RAP were heavily involved in fish raising and animal raising, this was not often mentioned as a water use (15%). Fishing was only mentioned by one focus group. Considering that the responses to all other activities were so predominantly centered on fishing and fishing income, it was surprising that fishing was not mentioned more often. This may be because fishing is such a common activity, that it is easily overlooked.

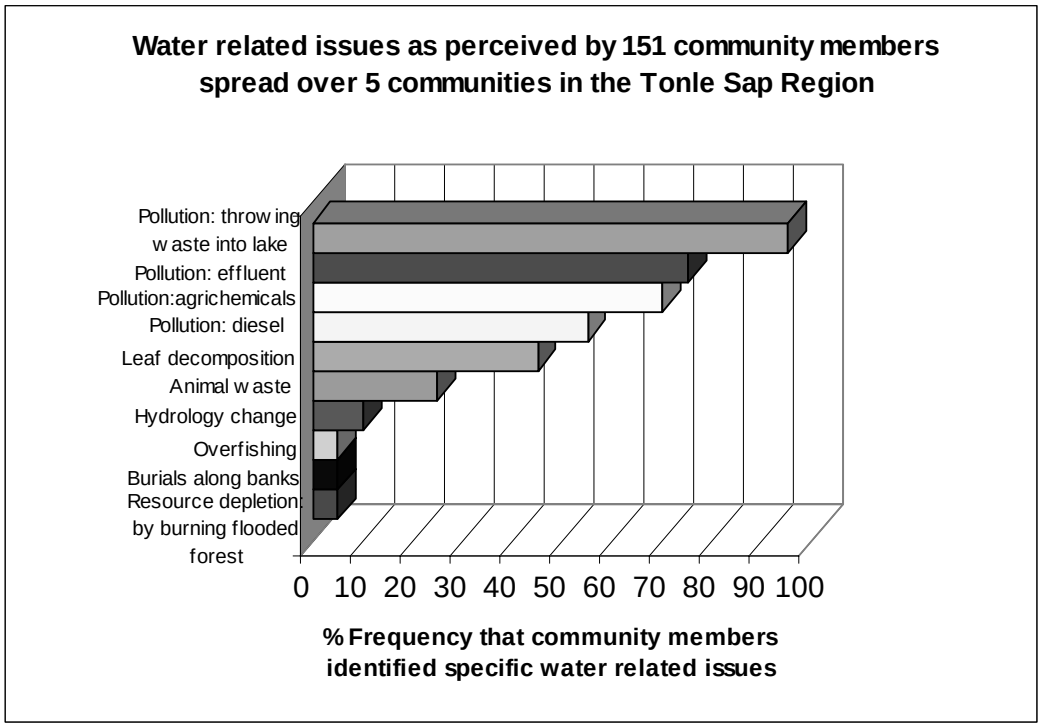
Graph 1.



Understanding of Water-Related Issues

60. Further discussions were interested in finding out what the focus groups perceived as major water-related issues in their community. Community results are grouped together in Graph 2. The results show that the most pressing environmental issue perceived by community members is pollution related to the common practice of throwing waste (plastics and consumer packaging) into the Tonle Sap waters (mentioned by 95% of focus groups). Following this concern was water pollution from direct human effluent, (70%), whilst 65% of focus groups were concerned about agrochemicals flowing into the water from lotus, rice and vegetable farms. 55% of groups mentioned high levels of diesel oil polluting the water from boat engines. Leaf decomposition was also identified as being associated with water pollution in the sense that it resulted in undrinkable water. To a lesser extent communities discussed animal waste (20%), hydrological change from erosion and dykes (10%), over-fishing (5%), human burial grounds along river banks (5%), and resource depletion through burning flooded forests (5%), as water related issues.

Graph 2.

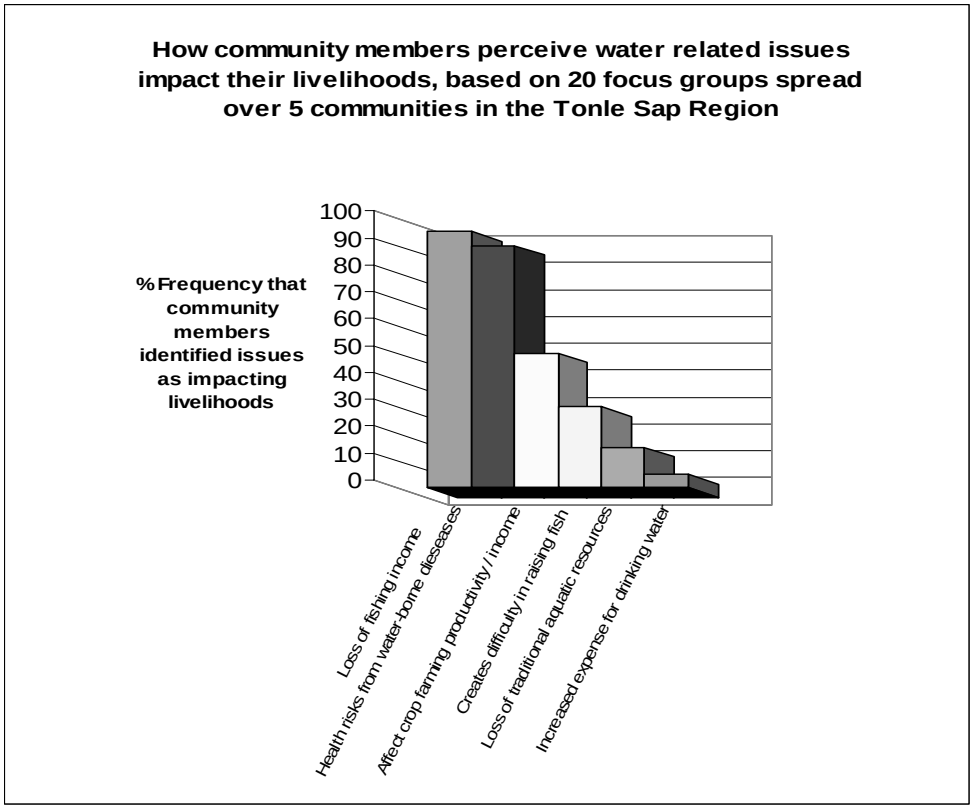


61. Of interest is the low frequency that communities identified over-fishing and flooded forest depletion as being water-related issues. Floating plastics often get caught in community boat motors and human effluent, chemical and diesel discharge are all highly visible and direct water contaminants. It is therefore not surprising that the frequency of these issues featured highly in their responses as these are the issues they see everyday.

Perceptions of Links Between Water Issues and Poverty

62. Graph 3 illustrates that 100% of focus group community members perceived water related issues to affect their livelihoods most directly through a loss in fishing income. A further 90% of groups saw their livelihood affected through health problems related to water-borne diseases stemming from water pollution. They also linked health problems to decreased income due to rest days and medicine required.

Graph 3.



63. For those communities who had large numbers of participants whose secondary income was derived from farming, land degradation and erosion were perceived to affect crop productivity and as a consequence farming income (mentioned by 50% of groups). 30% of groups discussed how water pollution has also created difficulty in fish raising. Fish raising is very common among many families in all communities. Raising enclosures are usually found around houses, and with much effluent around houses, mainly human and diesel, the productivity of fish-raising has reportedly diminished. 5% of groups saw an increase in water pollution as driving a necessity to divert a portion of income toward purchasing clean drinking water as they perceived the water in the Tonle Sap as unfit for direct consumption.

64. Purchasing clean water has become a newly-perceived expense of necessity for some people, while others simply do not have the means to source clean water. All community members have the knowledge that ideally they should boil the water they

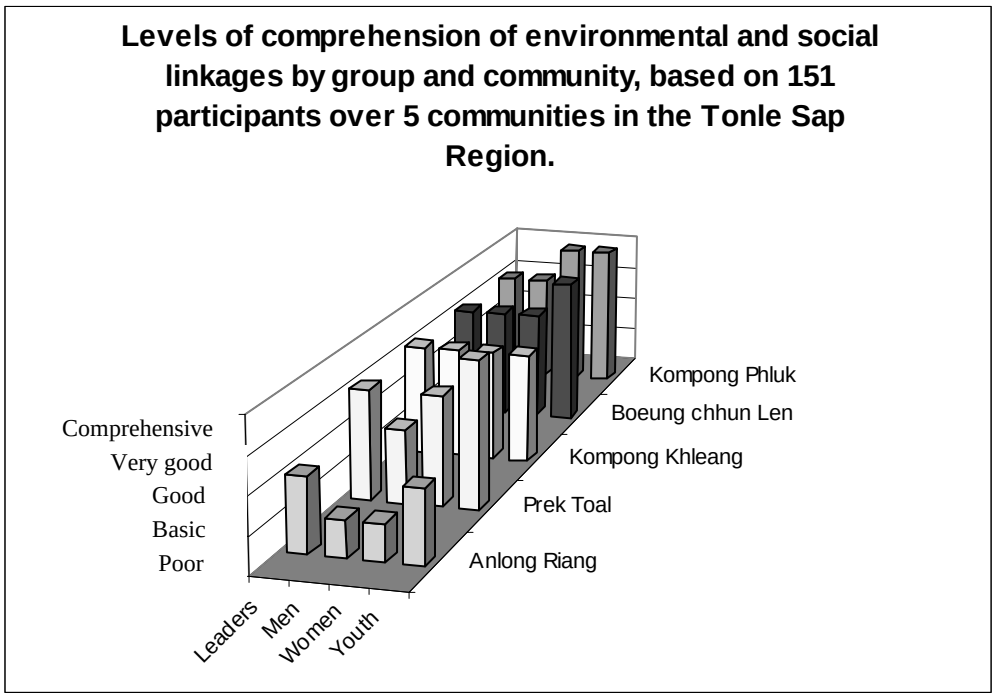
drink from the Lake, however it is not often done as it takes time that could be spent fishing and extra fuel (wood) that takes time to harvest or costs money to buy.

65. This exemplifies that whilst concern and environmental knowledge are important, it does not necessarily bring about behavior change.

Perceptions and Comprehension of the Social/Environmental Interface

66. An important part of the PDA was to assess the existing environmental comprehension of community members. In relation to environmental education as a tool toward poverty reduction it was important to identify to what extent community members could make linkages between environmental and social issues. The results can be seen by group and community in Graph 4.

Graph 4.



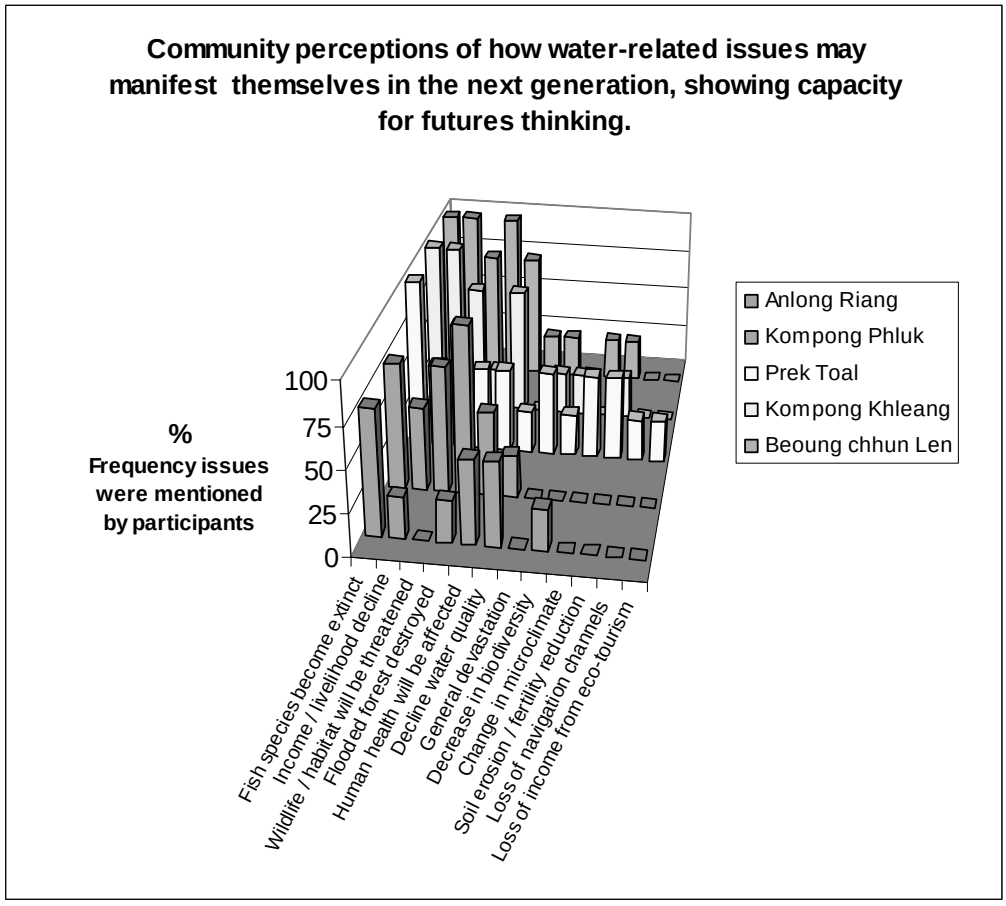
67. It is interesting to note that in all communities youth had the highest or equal highest understanding and identification of environmental and social linkages. This may be attributed in Kompong Phluk, Kompong Khleang and Prek Toal to environmental educative interventions for youth conducted by NGOs and government bodies. Women and leaders had consistent knowledge levels while men, where diversity existed, were found to have the lowest levels of comprehension. Overall Kompong Phluk and Boeung chhun Len community members had the best understanding with all focus groups being either in the very good or comprehensive scaling. The largest diversity in comprehension existed in Prek Toal, where men had a basic understanding, leaders and women were found to have a very good understanding and youth had a comprehensive understanding of social and environmental linkages.

Anlong Riang had the lowest levels of comprehension of all PDA communities. This may be attributed to the fact that Anlong Riang has received little development and environmental knowledge assistance in comparison to the other communities and has the lowest socio-economic conditions prevailing.

68. These results show most communities are not deficient in environmental knowledge. In fact most communities were found to have a good to comprehensive level of environmental knowledge but when further questioned, revealed that they were unable to make use of their knowledge due to a lack of access to power and economic incentive to make desired changes happen.

69. When considering the techniques the PDA and consequent EE activities might utilize to find support and desire for action, it is important to ascertain the communities' capacity for futures thinking. That is their ability to identify future consequences should current actions continue. Graph 5 depicts the frequency with which a range of consequences were mentioned by communities. For this activity a visual stimulus was used portraying all the usual daily activities that communities do around the Tonle Sap.

Graph 5.



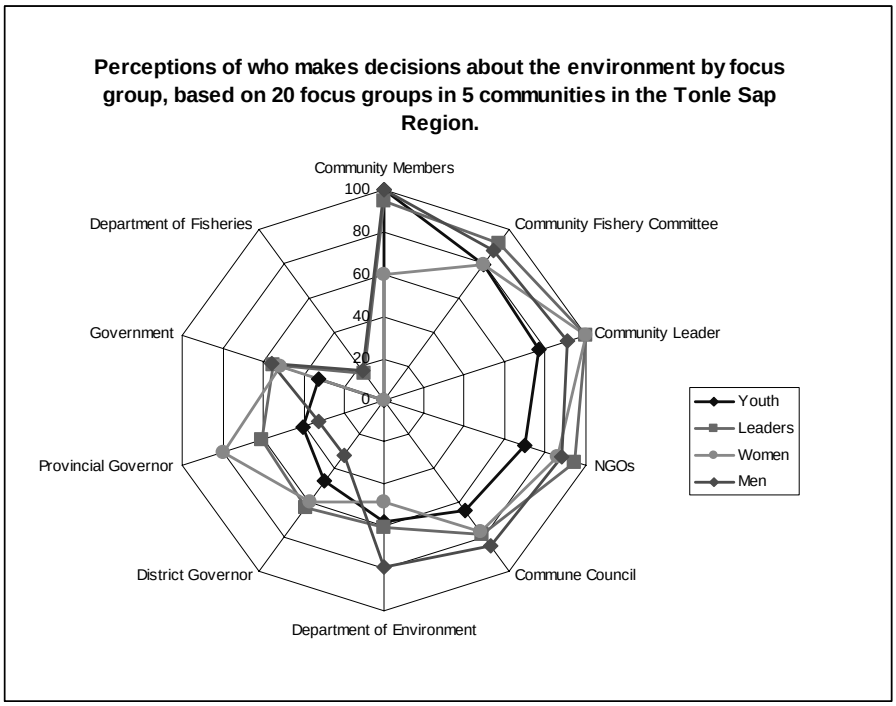
70. The results showed that RAP participants in Anlong Riang did not have a large capacity for futures thinking unlike participants in Prek Toal and Beoung chhun Len. Groups in Kampong Phluk were able to recognize many of the more obvious implications (extinction of fish species, income and livelihood decline, wildlife and habitat being threatened, threat to flooded forest, effects on human health, and decline of water quality) however they were not able to identify more insightful consequences. The ability for futures thinking on Graph 5 is seen to be closely related to the pattern of results found on Graph 4.

71. Diversity was shown within the research groups in Prek Toal. The Prek Toal youth focus group showed more maturity in their insights than either the men or leaders. Prek Toal youth and some of the women were able to identify less obvious future consequences such as threats to biodiversity, changes in microclimate and repercussions on wind breaks, increases in erosion and fertility reduction if forests are over harvested, loss of navigation channels as well as loss of income from eco-tourism. It is interesting to note that if the data from the Prek Toal youth were removed the graph the order of ability for futures thinking would be ranked in highest to lowest from Kompong Phluk, Beoung chhun Len, Kompong Khleang and Prek Toal, followed by Anlong Riang.

Perceptions of Who Makes Decisions About the Environment

72. Focus groups were asked to arrange or rank a set of ten named cards in a way that showed who they thought made the most decisions about the environment to who makes the least decisions about the environment. The results are displayed in Graph 6 for the collective groups of men, women, youth and leaders.

Graph 6.



73. Graph 6 shows the order in which each of the four major focus groups perceived and consequently ranked who makes decisions about the environment. As shown above, youth, men and leaders rank community members as those who make the most decisions over the environment. Women perceived that community members have a much lesser input and ranked the community leaders highly. In further discussions it appeared that women ranked community members lower than other groups, as they feel they do not receive much opportunity to have input into environmental decisions. Community fisheries and NGOs were also ranked quite highly by all focus groups. Leaders and youth tended to perceive the Department of Environment, District Governor, Provincial Governor, Government, and Department of Fisheries as much less involved in making local environmental decisions. The results indicate that women are less empowered than the other groups in regard to environmental decision making. Alternatively they may have been encouraged to think in formal ways that may not reflect reality, their perceptions influenced by the information given by visiting government bodies.

74. This activity resulted in fierce debate within focus groups as members all had different and strong perceptions of who they thought made decisions. Generally all focus groups came to a consensus in the way they grouped their ranking cards. The two most often debated placement of cards involved the government and the community fisheries cards. Some groups chose to ignore some ranking cards totally as they didn't believe they had much influence. In their explanations many groups said the order of ranking was related to the proximity each group had to environmental problems.

75. These results help to determine the extent to which community members feel they make decisions about the environment, as well as which bodies are perceived to contribute most actively to environmental decision making. Such bodies may be used as vehicles for capacity building.

Community Perceptions About Being Part of Environmental Change Mechanisms

76. Communities discussed how they would like to be involved in a national EE&A campaign. Initially the concept of a national campaign was not something they could easily envisage or were familiar with. The RAP found that most communities had similar ideas as to what they perceive they would benefit from. Note that these ideas were not suggested but arose from free-form conversation among participants.

77. Many groups said they felt they needed a participatory waste management initiative (75%), while 70% of focus groups expressed a desire for a participative flooded forest conservation project including planting using more flood resistant species. Many groups (55%) were also keen to designate extra days to eliminate use of illegal fishing gear. The first two activities are action orientated, and could be encompassed by the PDA, whereas measures to eliminate illegal fishing would require policy or legislation

with severe penalties. When some communities were asked why they want these changes, they responded that the district governor had advised them that these are priority needs. This brings about a little concern as to 'real' community needs and those needs they have been told are necessary.

78. 55% of groups thought that general education on nature conservation would assist them while 45% identified that higher knowledge levels and participation in releasing fish juveniles and endangered species would be appropriate. A lesser proportion of groups, 20%, suggested they would benefit from a clean water awareness project that linked health and water. 15% of groups advocated for gaining skills in alternate income generation activities and another 15% suggested they would like education on the reduction of agrochemical use. Participatory environmental protection in general and an improved toilet sanitation initiative were both advocated by 5% of groups. Overall the community members have positive perceptions about wanting to improve the environment, which could be one of the strongest drivers for PDA success.

79. These perceived needs should be the focus of tool development for the PDA while not limiting the PDA. It is suggested that these tools were identified because they have already been used and possibly previously advised as being necessary by officials. It may however be useful to incorporate some of these elements in the chosen tools to better position the PDA to manage the challenges of the context as well as community expectation of what constitutes a valuable tool or activity.

Future Needs of Communities to be Part of Environmental Solutions

80. It is very important to take full consideration of what people currently know and believe in order to identify what might be the most effective PDA tools.

81. Given the state of livelihoods in the research communities, the traditional EE paradigm that seeks a linear addition of awareness, knowledge, attitudes and skills in order to have sustainable actions, needs to be reassessed in the TSBR context. From the information recovered and lessons learnt, it seems community EE tools need to be action-oriented; the other usually linear progressive elements need to built-in so they occur simultaneously to the action. Action orientated activities need to plan for elements that show short-term results to enable commitment and buy-in to the project for the longer-term.

Summary of RAP Formal Education Findings

82. Institutional segmentation and isolation of responsibility for Environmental Education is a problem. Cambodia has the Department of Agriculture, Forestry and Fisheries, Department of Environment and the Ministry of Education Youth and Sports (MOEYS) all of which are somewhat active with respect to Environmental Education but at this stage they are not harmonized in approach or delivery.

83. Traditionally the style of teaching in Cambodia is quite formal and can be described as rote learning and transmission-modes of learning. However children of both genders are eager to participate when opportunities arise and appear to enjoy a more dynamic atmosphere.

84. During interviews it was often mentioned that the quality, commitment and accountability of teachers are seriously affected by factors including remuneration. Teacher absenteeism is quite high and is seen as the result of both poor pay and relatively low status of teaching as a career. Teachers are largely unwilling or unenthusiastic to carry out any extra work. With this as the case it has proved very hard to get teachers to incorporate extra EE activities. As an incentive and to foster responsibility Osmose pay teachers a per diem for teaching EE as a separate subject. The teachers must then report back with comments and progress on their use of the activities in an EE manual.

85. Teachers need incentives for employing EE in their teaching following training. Incentives alternate to cash should involve the support and recognition of EE by Education Policy objectives. Examples of good incentives could include the establishment of ‘biosphere environmental school project small grants’, however the best possible incentives for communities to partake in EE&A activities will be to create value by demonstrating that participating will help further community goals and reduce poverty.

86. Schooling is free in Cambodia and the costs involved in sending children to school are relatively small. Nevertheless some parents do not prioritize schooling against having an extra hand to help at home, or simply lack interest in educating their children. The majority of the population has only one year schooling.

87. MOEYS is not opposed to EE, but is expected to be reluctant to divert resources to it unless it is seen to offer a cost-effective way of achieving priority educational objectives. The current education policy embraces the theme of the ‘Child Friendly School Initiative’. The opportunity exists to be able to establish a well functioning tool that integrates itself into this theme. Meanwhile, the existence of the cluster school system adds to the accessibility of teachers to support each other in the context of new teaching methodologies based on action learning.

88. Currently UNESCO is working with the pedagogical research unit of MOEYS to include environmental science studies as part of the applied sciences, which now include earth & environmental science, biology & combined physics & chemistry. Social Studies are also compulsory in primary, including geography, history, civic morals & home economics. Khmer literacy and numeracy are also studied. EE's emerging themes through applied sciences are based on an old paradigm whereby science teachers mainly see EE in terms of exploring nature and understanding biological relations in nature. This preoccupation with exploring nature dominates many instructors' understanding of EE. EE has to be focused on human action and value judgment right from the beginning as it will not have true impact if treated as a kind of supplement to applied science.

89. Teachers are concerned about being able to handle a complex and value-laden process. It is concluded that intense training and commitment to EE with development themes needs to become a policy aim not only for the TSBS but also the MOEYS. Coupled with this approach, is the importance of recognizing the development of dynamic rather than passive qualities in students and the use of interdisciplinary inquiry to foster environmental awareness.

90. Major obstacles currently impede the required change in teaching perspective. Meanwhile reflection on processes and methods is essential if teachers are to understand the appropriateness of their students' critical exploration of social issues. This is very hard considering that there currently exists a teacher shortage. Teaching, unlike other government jobs, does not provide the flexibility to be able to take on dual roles for additional income.

91. Currently many EE materials (posters, games, and manuals) look good on paper, but unfortunately the teachers are not necessarily employing it in the classrooms. There is a need to build capacity for more effective and widespread implementation and for the training of many more teachers and teacher training colleges. Mlup Biatong is training master teacher trainers toward achieving upward impact.

92. Principle organizations such as UNICEF and UNESCO currently working with MOEYS should adopt and emphasize the philosophy that students should experience and examine their environment as a subject for interdisciplinary learning. Students should ultimately be provided with opportunities to relate to the environment in socially significant ways, and approach its state as a challenge for initiative and responsible action.

93. Teachers' pedagogies are affected more by the examination system than the curriculum. In its early stages, mainstreaming environmental education needs to focus on enhancing teachers' pedagogic practices within existing curriculum and assessment frameworks, particularly in relation to using the local environment as a

learning resource. Ways of doing this may include the development of appropriate learning materials and teacher education and training. In the longer term concomitant change in the assessment system should be maintained alongside curriculum and pedagogic change, particularly in assessing the more analytical and synthetic skills taught in areas that involve more social and economic emphasis.

94. Where EE can be linked to the enhancement of economic opportunity it may increase the probability that children will be sent to school rather than be an extra hand at home. Quality EE integrates work in schools with non-formal education in such a way to be both consistent and contemporaneous learning-in-the-community and continuous with learning that occurs later in life.

95. Effective teacher inclusion of EE requires strategies for innovative design, motivation and most importantly short-term and long-term reward. Innovative incentives should give a sense of empowerment that their situation (quality of life) will improve through participation. Although many barriers currently impede educational reform, EE has the ability to enhance alternative economic opportunities where learners improve their skills of sustainable resource management and meet their needs for increased long-term security. Education that creates greater demand and incentive for parents to have their children attend school is essential. Formal education will be more valued if it improves capability to participate in civil society and the labor market.

Status of Environmental Education in Cambodia

96. EE initiatives in and around the TSBR are characteristically small in scale and target local communities, teachers and primary school students. Existing providers of EE initiatives include Osmose, FAO Siem Reap, Mlup Biatong, Sangkrouh Satprey and other NGOs, IOs and government staff to a lesser extent. So far no formal impact assessments have been conducted of these initiatives. This makes it difficult to assess and share lessons of what tools have been successful and effective and what tools have lacked the capacity to create real change.

97. The UNDP/Capacity 21 CBTS Project Implementation Strategy Report, p18 states that EE in the TSBR is still in its infancy stage. The RAP found evidence that was consistent with this statement.

98. The meaning of ‘Environmental Education’ varies across delivery organizations and should be expected to evolve over time. A shared acceptance of the different concepts between stakeholders is required to identify commonalities to open up dialogue. Diversity needs to be seen as an opportunity rather than weakness.

99. FAO Siem Reap in collaboration with Osmose and Mlup Baitong developed a curriculum manual which published 1000 copies in 2003. In November 2004 these

partners will review the manual based on teacher feedback. The manual contains 14 environmental themes. To date Osmose has trained some 40 teachers in two day workshops to enable them to utilize the manual. Mlup Biatong have trained a further approximately 25 teachers to utilize parts of the manuals in running extra-curricula 'Eco-clubs' for primary students in and around the Phnom Penh area. Both organizations pay the teachers a per diem to include education about the environment along side school lessons, which is intended to keep the teachers accountable to carry out the activities and to provide an incentive for feedback on revision of the manual. Mlup Baitong also broadcasts from the Women's Media Centre twice a week in a format that includes two 15 minute segments on environmental issues and a one hour show that receives call-ins. So far the true impact of the programs has not been successfully measured.

100. The Siem Reap based FAO project, Participatory Natural Resource Management in the Tonle Sap Region, established the GECKO Centre (Greater Environment Chong Kneas Office) in 1999. The GECKO centre is a fixed floating exhibition situated in Chong Knea, Siem Reap Province. GECKO exhibits the various fishing techniques and livelihoods used in the TSBR as well as some small exhibits on biodiversity. GECKO staff identified the intended audience to be local fishing communities, tourists and primary school students however the dominant visitors are the local school students in close proximity to the centre. Currently groups of 16 primary students visit the GECKO once a week for an hour session that is adapted from the EE Manual. Reportedly around 5000 students have attended a session of some sort with or without the manual at GECKO. GECKO has stimulated the development of a video on flooded forest protection as well as posters and awareness signage.

101. FAO also conducts EE workshops for monks and have developed a manual of EE that centers on Buddhist themes. In each Pagoda five monks are trained; thus far four Pagodas have undergone training. Mlup Baitong also carries out EE training through Pagodas. FAO have also developed outreach for non-formal education in fishing communities, however funding is currently required to continue with the program. During the program two villages were involved in providing actors for a video production that resulted in a small degree of apparent noticed behavior change.

102. Major providers of EE are centered in Prek Toal and Siem Reap and are largely awareness focused and to a lesser degree, action orientated.

103. CFDS, SIPAR, and Forum NGO have created some smaller scale materials, mostly posters and stories for community use. The Provincial Environment Department in Battambang and Pursat has also produced posters in collaboration with the Department of Nature Conservation and Protection, the Department of Environment and the TCU (Technical Co-ordination Unit) in Prek Toal. CSARO works in Phnom Penh on recycling projects, while JICA has been involved with environmental

awareness training at the government level. The Department of Environment has an Environmental, Communications and Information Unit that primarily focuses on organizing community efforts toward 'Clean Up the World Day' and a quarterly newsletter.

Challenges of Existing Community and Formal Education Systems

104. The PDA will be more likely to assist communities in moving toward more sustainable development if the forces that create existing conditions and could influence the change process, are assessed. For example the socio-cultural values associated with knowledge and learning represent some of the cultural variables and challenges that need to be taken into account in the design of the PDA:

105. *Knowledge seeking and sharing is not always a culturally valued activity in communities in the TSBR.* During interviews with NGOs, teacher training institutes and MOEYS, there was general agreement that in rural areas knowledge seeking is not necessarily a highly valued activity. Therefore building a knowledge based natural resource management tool for communities is bound to face enormous challenges unless it demonstrates its value through short-term tangible outcomes.

106. *Collective action in environmental knowledge domains is low to non-existent in TSBR communities.* Knowledge creation, where is exists, is perceived as a formal teacher-expert-led enterprise and not as a collaborative social process. Collective action needs to be nurtured in schools through collaboration with environmental knowledge organizations and institution to 'localize environmental knowledge' to enable higher levels of community action and traditional knowledge sharing.

107. *Displaying one's own 'environmental knowledge gaps' in public loses face for many people.* Some of the community members who took a lesser role in group activities did so as they feared 'losing face'. Not being able to make a meaningful contribution hindered their full engagement in activities.

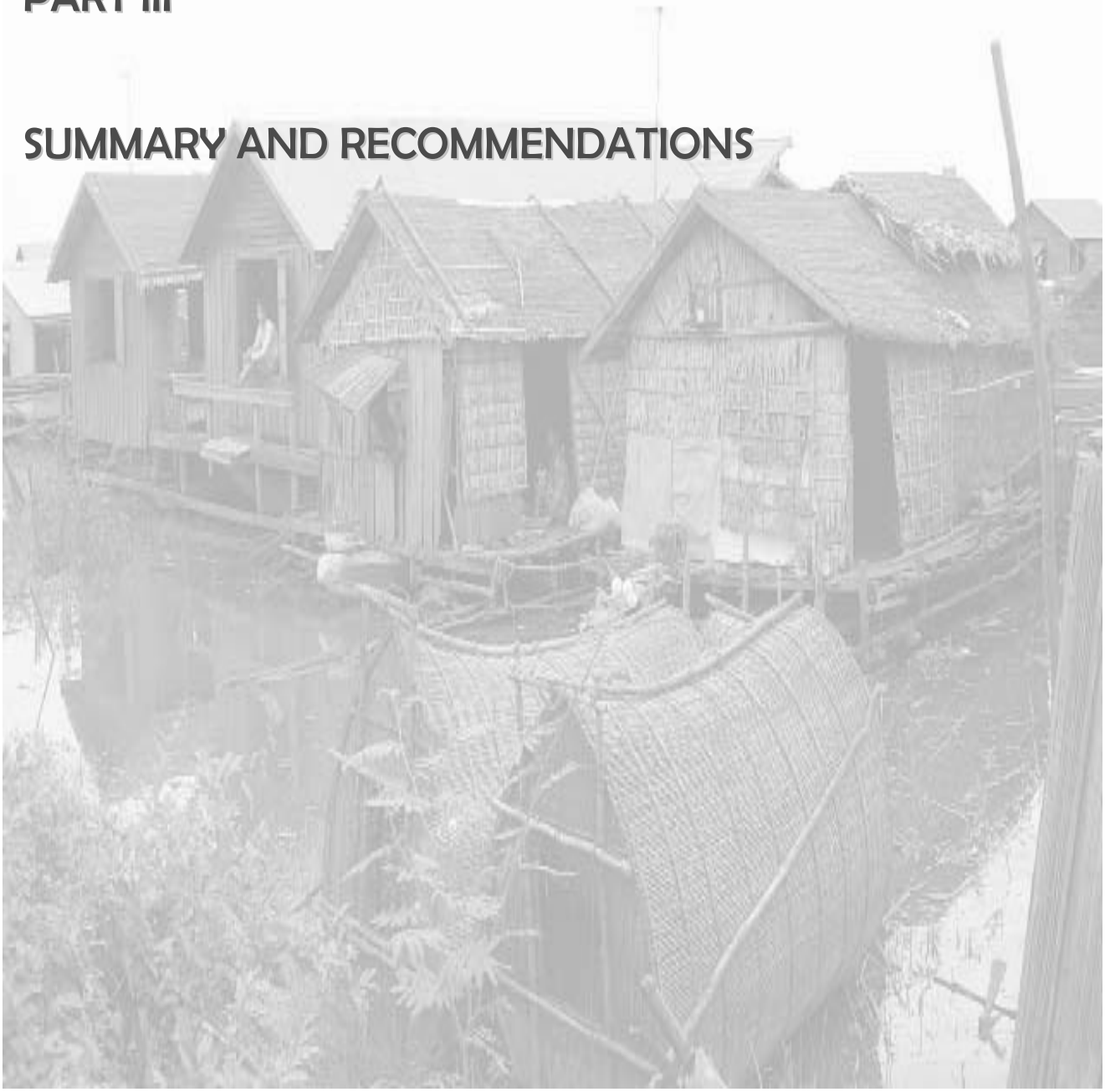
108. Empowerment is integral for improving the quality of life and decreasing poverty for communities. However the use of techniques of participation in civil society as a form of EE may be politicized in the eyes of the government, and therefore resisted.

109. *There exists a social system of mistrust of government authorities.* The results show that while community members could engage well in group activities and communication, they may not be as skilled in, comfortable with or consciously elect to use tools that do not instantly make a change. The communities have reported to make a conscious decision not to invest time in these sort of tools if 1) government structures do not provide a good example themselves, 2) if other communities do not make a fair effort to contribute, and 3) if the benefits are delayed. These current

limitations suggest that tools such as community water monitoring will not suit the context at this stage because changes will not be seen in the short term and it will take time away from economic activity. Communities will be unlikely to participate. Concurrent to these concerns, people's desire to advocate for change is embedded in a past bequeathed by the previous Pol Pot regime that leaves many people with little desire to trust government bodies or be part of something which makes an individual stand out from others in the community.

PART III

SUMMARY AND RECOMMENDATIONS



Summary and Recommendations

110. Much goodwill exists between organizations providing EE and working together for the benefits of the Tonle Sap people. The EE&A campaign must ensure that this harmony is harnessed and partnerships and open collaboration remain across all sectors of civil society, utilizing existing experience, knowledge and resources of communities, NGOs, community-based organizations, Pagodas, commune councils and government departments etc.

111. Organizations engaged in EE&A initiatives recognize the value of environmental knowledge for development and also the value of inter-organizational cooperation and collaboration in developing EE tools and training. They are supportive of the PDA especially if it can begin a process of streamlining EE modules into formal school curricula. The RAP also identified some areas where EE can be strengthened through:

- building capacity for real implementation of EE by trained teachers,
- cultivating domestic expertise in participative EE facilitation techniques,
- promoting a collaborative focus on local needs,
- committing centers to community involvement,
- engagement with traditional knowledge, and
- promotion of individual and community reflective activities.

112. Environmental education's appeal to a multiplicity of disciplines reflects its relevance to local needs and concerns. Using the PDA and the TSBS to promote the mainstreaming of Environmental Education could offer:

- a pedagogy which is responsive to Tonle Sap geographical, economic, religious and social needs,
- a possible way of integrating and engaging traditional ecological knowledge into the curriculum,
- a focus on the learner, the school, and the community and,
- relevance to environmental health issues.

113. The content of some EE initiatives is conceived by scientists, rather than educators who are scientists or scientists who are also educators, and often the pure scientists do not match content with the realities faced on the ground.

114. Master teachers who practice new pedagogies in their classrooms and work with other teachers are more likely to be able to instigate those other teachers to make change than practitioners who are seen as more removed from the classroom or school reality. Curriculum reform must be met be assessment reform.

115. Highly trained facilitators need to be scattered across EE providers in a range of provinces. The dissemination of information can be enhanced by facilitators that use

methodologies that promote critical thinking. Also providers need to have a common understanding on what they perceive EE as being and differences that exist between conservation education, environmental awareness raising, nature studies and EE toward sustainable development.

116. The fact that EE is inescapably linked to themes of development and quality of life provides a solid reason to incorporate education toward sustainable development as an actual goal of policy content. This will create greater support and continuity in delivery for EE. This focus comes with conceptual and pedagogical trends which are very different from those commonly employed through a plethora of activities, all currently referred to as EE in Cambodia.

117. It is important that the PDA is not seen as an 'add on' to other EE&A activities, but rather as a central component to national development of tools and methodologies through the TSBS.

118. In the realm of formal education this means that while EE is currently practiced in an ad hoc manner as additional curricula, the reconceptulization will focus on transferring environmental education from 'another area of learning' to a streamlined participatory process. In many countries, including Cambodia, this shift is particularly difficult as educative institutions don't easily lend themselves to student inquiry, as the teacher is seen, and often perceives themselves to be, the sole bearer of information at the head of the class. Information is to be taught and transmitted, not to be examined and discovered by active independent learning. Teachers lack experience in open forms of classroom teaching. But the shift is possible and many examples pave the way for inclusion of different pedagogical approaches in classroom dynamics.

119. It was noticed that many different kinds of organizations within Cambodia and the TSEMP project are currently involved and interested in changing people's attitudes, values and behaviors toward the social and physical environment of the TSBR. Many of these organizations are newcomers to the sphere of environmental educative activities and approach it with varied interpretations as each organization seeks to interpret EE goals in the light of their own particular interests.

120. The goal of sustainability demands that the delivery of EE needs to be reconceptualized in many situations. When reconceptualizing EE, new pedagogical trends need to be introduced that incorporate the wider substance and scope that EE can offer; a scope that is most applicable to the current Cambodian context and the aims of the TSEMP.

121. This scope encompasses issues such as food security, poverty, women, green consumerism, ecological health and waste management as well as those of

deforestation, depletion of natural resources, land degradation, and loss of biodiversity. In addition, education about biodiversity and other nature–based themes need to be immersed in concepts of human rights, equity and democracy, all core issues of sustainable development.

122. It is suggested that the TSBS, in order to make the best effort in guiding activities to alleviate poverty in the TSBR whilst promoting sustainable resource management, should be fully mindful to embrace the shift in EE with sustainable development as its goal. This is a long-term approach for Cambodia as many factors currently impede change.

123. For individuals to commit to sustainability they will need to be immersed in activities that involve critical inquiry to explore the implications of sustainability in the context of the economic, social, political, and environmental forces which impede and foster sustainable development in the TSBR. Many of these issues, particularly political and power issues linked to environmental sustainability are well entrenched and opposed to change.

124. Socially critical processes can be very difficult, delicate and slow, yet are a key component of poverty alleviation and environmental and social change. A critical approach to local social issues creates meaningful contextual knowledge which does not gloss over conflicts and controversy but opens up the discussion to further discourse. The impediment to this in Cambodia is the amount of uncertainty it can create and people's fear of creating an atmosphere of uncertainty due to their political past. Uncertainly is a decisive factor as to why teachers tend to avoid talking about local environmental and social issues as learning spheres. Environmental equality can not exist without further moves to social equity. It is important that the tools and methodologies chosen for the PDA must also commit to this end.

Implications for Innovative Environmental Education Tools and Methodologies

125. It has been noted that great efforts have gone into EE activities in the TSBR in the past ten years mainly in the area of awareness raising and information dissemination.

126. The focus of EE in the TSBR has been within the bio-physical paradigm, exploring environmental linkages and some 'cause and effect' theories. While this paradigm is important and relevant, upward attention needs to be paid to the social and economic processes that mediate environmental sustainability. EE carries the greatest impact when delivered through a socio-economic paradigm which links to policy, sustainable livelihood and community development in a broader sense. In practical terms this means that linking environmental degradation to social and cultural behavior becomes increasingly important. The research shows that many community members are aware

of the degradation of surrounding environment in relation to water, however many appear to lack the social/economic skills needed to sustain water resources.

127. A common myth about environmental behavior is that people may not behave in a certain way because they do not know enough about environmental issues therefore a common strategy is to spread information to raise awareness. The assumption of this approach is that if people are informed that their actions are destructive for the environment, they will consequently adopt more environmentally friendly behavior. In the case of the communities in the RAP their knowledge is generally very high however they do not have the equipment or power and allegedly time to put their knowledge into action. Providing information can be a very useful tool however it is not enough to change environmental behaviors in the Tonle Sap Region.

128. The PDA needs to focus not so much on communities acquiring information about the environment, but applying deliberated solutions into action.

129. Currently the teaching and learning culture is embedded in the Khmer culture whereby a younger person does not question an older person's knowledge and certainly an older person is not told or influenced to change their behavior by a younger person. In this sense it is important to realize the limited impact that educating the younger generation can have for engendering catalytic change in the older population. If a more sustainable form of development is sought through the TSBS it must seek to raise the knowledge and environmentally responsible actions of adults. The non-viable alternative is to wait a generation until the youth of today are elderly themselves.

130. EE is contextually appropriate however its method of delivery is dependent on the prioritization of immediate and long term needs identified by the community. EE must do more than inform communities about long-term benefits of environmental preservation. It must show the environmental assets can provide a stream of income both in the immediate as well as the future. In principle environmental education and poverty eradication are linked by the issue of need. For the very poor, if the generation of an income stream provides no alternative than to involve environmental degradation, then that degradation must be tolerated, since the choice at the margin is worse. The threat to long-term needs can only be seen as secondary, since those that starve today can not enjoy the benefit of preservation tomorrow.

131. Given that a variety of meanings are attached to EE, the PDA may not necessarily be identified as a productive, action-oriented project when using this term to find common ground with other organizations and individuals. Such organizations and individuals should be made aware that Environmental Education is concerned for the following:

- enhancement of economic capabilities or opportunities and the sustainable use of natural resources,
- improvement of practice in curriculum development and educational participation rates,
- development of opportunities for, and skills of, participation in civil society,
- provision of basic services to local communities, and
- facilitating the recognition and utilization of traditional skills and practices.

Suggested Methodologies For Forthcoming Tools

132. Critical thinking needs to become a key ingredient in all EE ventures because it problematizes knowledge and values. When EE is combined with action-based learning, it requires investigation of local issues, and it relies on local participants' willingness and skills to enable environmental, social and structural change. Active participation of communities in the development process of solving community based problems is a prerequisite for durable EE. These kind of skills are paramount to interpreting root causes of environmental issues and in examining teachers' and students' perceptions of, and contributions to, environmental and social change.

133. It is important that there are always one or two clear 'doable' messages in community EE activities. If efforts are spread too thinly or vaguely over a range of issues, these efforts may fail to induce meaningful action or change.

134. Having fresh and innovative tools is not enough to ensure that communities will participate in activities. It is necessary to identify the drivers that can facilitate the success so that communities engage in activities that target prime community concerns in a meaningful way. Prime concerns are clearly income generation and improved health. Increased knowledge is only actively sought if it can be combined with the primary concerns. Realistically in the community context members can only have meaningful and lasting redirection toward more sustainable practices if those practices can be directly linked to income generation.

135. To fully maximize the impact of EE in the TSBS, the tools and methodologies chosen will need to recognize:

136. *Upward attention needs to be given to the link between family level micro-economics and environmental conditions.* Attention must be paid to the complexity of human interactions with the environment, including the economic, political, cultural and social systems in which people operate, as well as the natural systems. Cambodian communities in the TSBR illustrate just how intimately these systems are linked. As a consequence the tools chosen will need to tap into the local economy to make the environmental concerns a priority.

137. *Behavior change will only be seen if EE tools and activities do not create an extra activity.* Catalytic environmental behavior change will only ensue if EE tools and activities do not create an extra activity to everyday activities that are generally primarily focused on income generation from fishing. In poorest homes this includes income generation from fishing, to provide day to day meals.

138. There are two foreseen ways to tackle this. Leaders, men, women and youth are all very keen to be involved with educational entertainment e.g. in the form of puppet plays or drama that inform doable actions whilst being based on existing or historical cultural interests as most communities have little entertainment. The more difficult but perhaps more sustainable way is to design tools and training that can draw people away from fishing and streamline them into other modes of making a living. Women in Beoung chhun Len expressed as desire to grow flowers and make sweet smelling hanging arrangements that are popular in Cambodia. Osmose have two examples of alternate income generation. The first was their work with WCS to assist bird poachers to move away from poaching and to be employed and trained as environmental rangers. Osmose have also assisted some women in Prek Toal from reliance on fishing to alternate income generation from making traditional handicrafts from water reeds they also had to assist these women in identifying markets for selling the reed bags. Both these options change behaviors and impact the environment while maintaining family incomes.

139. *There is a need for emphasis on visual tools.* Visual tools are required in Cambodian EE as up to seventy percent of community members are illiterate and most have only spent one year in formal education.

140. *Pilot communities have many other focuses and pilot programs occurring.* The PDA's 'litmus test' will be its ability to be valued by already 'over-NGO-ed' communities.

141. *Culturally accepted activities and information delivery channels.* By integrating with aspects of Khmer culture and putting a new light to accepted communication activities, communities have a higher chance of participating in activities that contribute to sustainable water resource management and activities that stimulate poverty reduction. Innovative approaches that respect indigenous knowledge make it easier for participants to cope with perceived risks involved with behavior change.

142. Religion plays a major part in daily life and in the formation of individual attitudes towards key issues such as education, health and the environment. Buddhism can point to an appreciation of the world's resources as a fundamental tenet of its faith. The role of Pagodas have considerable potential in supporting environmental education through linking it to people's spiritual learning and their sense of relationship with the environment. Pagodas hold much educational and spiritual

influence especially in rural communities. Some environmental educative organizations are currently beginning to integrate Pagodas into their outreach training.

143. *Opportunities exist for radio documentaries.* Radio is a key and popular channel of information delivery in rural communities. Given this communities saw the option to air a series of one minute environmental documentaries designed to change attitudes as an exciting prospect. It was suggested that documentaries could explain case studies of successful ventures by communities in the TSBR. Local 'heroes' (well known people in any arena) could host the documentaries. Women are the head of many households and as such have a primary role of environmental management in their household. They reported that they would be more likely to alter their practices if they are able to identify with a female role model or local hero.

144. *Opportunities exist for utilizing drama and puppetry.* Communities are very enthusiastic about the use of theatre to present environmental concepts. If this is a designated channel of knowledge creation then performances should highlight action taking skills and integrate with Buddhist stories. Following performances people should be encouraged to feel free to ask questions about the environmental issues and discussions should take place about actions that could be taken to alleviate pressures on resources.

145. With regard to formal education tools, teachers need to move away from static lecture-based seating patterns of classroom management and discover that they can maintain control of the classroom without needing to stand at the head.

146. Traditional methods of instruction will initially be challenged by the following suggested tools and methodology suitable to the context:

147. *Additional opportunities exist to utilize a combination of radio broadcasts and a roving drama group.* One option for already overworked teachers may include radio broadcasts. To relieve the pressure on teachers and streamline the time it would take to train many teachers it is suggested that radio broadcasts would be advantageous. Such shows should cover the importance of the environment and the actions needed to maintain it; most importantly tasks and activities suggested need to be action-orientated. Practitioners suggest such a program could be aired twice a week and include a roving drama group that visits schools and interviews young people to air on the show. The drama group could involve active participation from students and use puppetry to lighten the topics at hand whilst engaging the audience. The drama group should research what music is popular with the young audience and incorporate catchy lines that can be later recited in 'popular school' culture.

148. *There will be a definite need to streamline EE into existing subjects.* In the future a Curriculum for Integrated Environmental Education showing how EE can be infused

into every primary grade subject and a manual for teachers containing interactive lessons for all subjects that is approved and backed by the MOEYS. It is very important to show how EE can be infused into existing subjects so it is not seen as an extra. It is also very important to make the tools very accessible and easy to 'pick up and use'.

Concluding Remarks

149. This RAP is designed to provide a basis for the development of EE tools and methodologies. It is expected that the results of the RAP will be translated into a design that is both effective and appropriate to the expectations and context of the beneficiaries.

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ANNEX 1

COMMUNITY PROFILES

RAP COMMNUITY PROFILES

Community	Population	Primary occupation	Educational attainment	Environmental conditions	Environmental comprehension	Previous & existing environmental educative interventions
Anlong Riang Pursat Province Pretest community Tonle Sap Lake	Floating community with 91 households. Lowest level of livelihood.	Full time fisher families (fishing, selling, raising, processing, gear making).	Around 50% completed only 1 year of schooling. School building has not been used for some time as teacher is seeking alternate income means. 75 children are currently under 14 years of age and are not attending school.	Unsustainable harvesting of surrounding flooded forest ensues as does problems of controlling illegal fishing, set in a rapidly growing population with upward levels of human based water pollution.	Leaders: good Women: basic Men: basic Youth: good	CFDS has recently begun environmental awareness through a literacy program that uses environmental resource learning materials an addition program is introducing NRM themes. A Community Fisheries Committee was established in 2001 and includes 10 men and 2 women. UNDP is providing training to CFDS to work efficiently in NRM related activities.
Kompong Khleang Siem Reap Province Transition Zone	Community on stilts with some floating houses, approximately 215 households. Higher level of livelihood.	Full time and part time fisher families (fishing, selling, raising, processing, gear making), rice farmers.	Around 40% are reported to have only 1 year schooling and 903 individuals remain totally illiterate.	Concerns are centered around the loss of income related to pollution of water resources through agrochemical runoff, diesel discharge and community plastic waste in the water. The area has 1 fishing lot owned by 4 families of which 61% is leased to community fisheries.	Leaders: very good Women: very good Men: very good Youth: very good	FAO have been working on participatory resource management activities for an extended period providing technical support. The World Fish Centre attempts to collect household fish catch data for assessment. Various other organizations have development pilot projects in the community.
Prek Toal Battambang Province Core Zone	Floating community with 957 households. Higher level of livelihood.	Full time and part time fisher families (fishing, selling, raising processing, gear making), a minority are crocodile or lotus farmers.	Around 60% have completed either 1 or 2 years of primary school. Osmose run additional classes on weekends for children and youth on environmentally themed activities.	Characterized by preserved flooded forest, much biodiversity, most important breeding and feeding grounds for endangered water bird species, also home to water snakes and crocodiles. Concerns still abound over sustainable	Leaders: very good Women: very good Men: good Youth: comprehensive	Osomse embraces 'the Osmose family' – a group of poorest people who have receive assistance through environmental education, micro finance, alternate livelihood projects, ecotourism, and participatory management of resources. Tonle Sap Conservation

				flooded forest harvesting and protection of endangered birds along with illegal fishing and community concerns of dumping of waste into the Lake.		Unit (TCU) funded by UNESCO aims to serve as a research facility but its activities are limited and infrequently utilized. WCS employs previous bird catcher as environmental rangers however their ranger training is limited.
Kompong Phluk Siem Reap Province Buffer Zone	Community on stilts with 434 households. Highest level of livelihood. Vietnamese minority.	86% Fisher families (fishing, selling, processing, gear making), wet season rice farmers, mungbean farmers in the dry season.	Around 50% are reported to have only 1 years schooling. The primary school currently has very low attendance levels.	An extensive rehabilitation of flooded forest has ensued where watermelon farming was once causing massive changes in micro hydrology and erosion as well minimizing wind protection. Along with projects like this, there has been a long history of resource management in the area, often stated as being the most impressive in the Tonle Sap Region. Village resource management committee established in 1999.	Leaders: very good Women: comprehensive Men: good Youth: comprehensive	FAO among other organizations have provided much technical support through a variety of community based development projects. Kompong Phluk has a strong history in resource management, specifically flooded forest protection and the community has developed a Fisheries Management Plan.
Boeung chhun Len Kandal Province TSR catchment	Community on stilts. 476 community members. Higher level of livelihood.	Nearly all families are fishers as well as rice farmers. Aquaculture is extremely common.	Around 50% have attended at least 2 years of schooling.	Agrochemicals from rice farming are said to be threatening the integrity of the fishing reservoir. The small reservoir is very susceptible to pollution through chemicals, human effluent and plastic waste. Flooded forest is also threatened.	Leaders: Very good Women: Very good Men: Very good Youth: Comprehensive	JICA has done much work in water and health and has provided assistance in building wells for fresh drinking water for houses to share. CNMC assists the Community Fisheries Committee to management fresh water resources. CIDRE micro credit and rice farming assistance.

ANNEX 2

CONTEXT OF THE RAP

CONTEXTUALIZING THE RAP

Brief description of existing water-related NRM issues the TSBR

1. An intimate relationship exists between the livelihoods of Cambodians and the benefits that result from the changing hydrological cycle of the Tonle Sap. The area of the Tonle Sap is seasonally dependent. On an annual basis in early June a mass of snowmelt from Tibet causes the Mekong River to rise and flood. The flow is forced backward and up the Tonle Sap into the Tonle Sap Lake, absorbing much of the Mekong's overflow. This cycle forces the lake to expand its dry season surface area four fold to well over a million hectares in the wet season. The lake remains swollen for the next four months, flooding an expanse of forest area. This serves as a rich fish habitat to many migrating species that provide the sustenance and livelihoods to 1.2 million people that live in the Tonle Sap Area. In October the lake reaches its maximum depth and the river reverses its direction and the lake starts draining until the following year when the cycle begins again.

2. During the months of March, April and May the lake is at its lowest and many communities are located in the middle of the lake for economic reasons. Floating houses, which are common in and around the lake, are built and float on bamboo rafts, oil barrels, and metal pontoons which move with the seasons. Narrow wooden boats are used as houses by the poorest fisher families. Fixed houses are built out of palm leaf or wood on stilts.

3. 40% of rural households live below the poverty line in the TSBR while 82% of houses in rural areas have no toilet, and less then 1% have electricity. The population of Cambodia is expected to rise from 11.5 million to 14 million by 2005.

4. Many of the problems resulting in degradation of water-based natural resources in the Tonle Sap are exacerbated by the pressures associated with rapid population growth and related existing social practices.

5. Consequently the lake's regeneration capacity is being threatened. The flooded forest has halved between 1960 and 1991. 200 species of fish live in the Tonle Sap, while 225 species of birds and 46 species of mammals live in the Tonle Sap.

Environmental Problem Identified	**Contributing Socio-Economic Factors**
Loss and degradation of flooded forests	• Overexploitation of forest resources for housing, construction and fishing equipment (boats, rods, fish traps).
Decrease in fish and fish diversity	• Overexploitation for food and economic security. • Lack of examples and incentives for establishing and managing resources sustainably. • Weak regulatory frameworks that are enforced in an ad hoc manner.
Changes in water quality and hydrology	• Untreated domestic wastes. • Untreated industrial effluent, agrochemicals, oil. • New dams in the upper course of the Mekong River.

Along with the other components of the TSEMP these phenomena indicate that an urgent change is needed to alter human behavior in relation to water-related issues in favor of genuinely sustainable development.

Livelihoods in the Tonle Sap Region

6. Communities living in the Tonle Sap Basin face a wide range of problems including difficulties in obtaining health services, safe drinking water and adequate incomes. Most community members have no prospect of ever being able to own land. Villagers harvest flooded forest, mainly for firewood and to make charcoal. Branches and vines are also required to build houses and boats, or to make fishing equipment.

7. Illegal activities by private fishing lot 'landlords' have further deprived some communities of their economic independence. These circumstances have led to a situation where those who are able to afford large scale fishing benefit from reaping remarkably more resources than the smaller scale fisher people. Overpopulation and poverty have ensured the prevalence of disease and environmental mismanagement.

8. It is relatively easy to assess people's standard of living from their dwellings and their occupation. As fish accounts for about 75% of Cambodians' protein intake, fishing and related activities are by far the main livelihood for people living around the lake. Fishing in Tonle Sap Lake involves a wide range of techniques. The Fisheries Law not only bans the use of lights, electricity, explosives etc, but also details the type of equipment to be used in each of the defined categories of fishing, small, medium and large or industrial scale fishing.

9. Industrial or commercial fishing mainly involves "lots" or large-scale concessions. Lots used to cover nearly 80% of the lake, leaving little room for poorer communities. The system has been under revision since late 2000, when the fishery review resulted in some lots being redistributed to local fishermen.

10. Medium-scale fishing takes place outside the lots and a license is required. Medium and large-scale fishing is officially banned from June to September but this restriction is often poorly enforced. Family or small-scale fishing, which is the biggest of the three categories, continues all year. Conflicts often arise between local fishermen and the lot owners over the delineation of fishing zones and their respective rights.

11. Agriculture takes up about 25% of the Tonle Sap area. Farming practices are both small and simple and centre around rice production. Most farmers also fish in rice fields or nearby streams.

12. Fruit and vegetable cultivation is confined to the non-flooded zones and the banks of rivers. Corn, mungbeans, soybeans, watermelons, eggplants, cucumbers and many types of spice are dry-season crops. They are usually planted from December on and are harvested three to six months later. The output is either destined for self-consumption and served with daily rice, or sold on a small scale at the market.

ANNEX 3

RAP PURPOSE AND METHODOLOGY

Purpose of the RAP

1. A RAP was identified as being necessary to provide a rapid insight into community perceptions of their situation in relation to water issues, and perceptions of how water impacts their livelihoods. In addition, the opportunity was used to explore what tools community members perceive they need to contribute to environmentally beneficial change. RAP information was collected through a number of focus groups conducted in each of the four communities and informal communications were conducted with organizations who currently carry out EE&A initiatives in the TSBR to identify lessons learnt and their visions of how the PDA could complement their work. Their input complements the information gathered from the communities.

2. *Purpose 1*. The research will guide the identification, the nature and the context for suitable environmental education tools to implement the PDA Water Awareness Program (WAP). The tools chosen will be based in the communities' existing knowledge base and perceptions with a review of existing approaches, curriculum frameworks and resources.

The outputs of the PDA include two EE&A methodologies and two tools for community based problem solving along with the development of a practical teaching methodology for EE&A which highlights water as a demonstration issue.

Purpose 2. The research will also form the baseline for the final evaluation of the WAP PDA.

Research scope at design

3. The research is designed to find out information about the knowledge, attitudes (perceptions) and practices of a random selection of community members in issues related to water.

4. The two tools used to gain information during the focus group include:

1. a picture stimulus, and
2. ranking cards.

These two tools will help assess the knowledge, attitudes and practices of the four communities chosen for research. Stimulus tools made it easier for groups to participate freely in the RAP.

5. While a project may streamline some processes by only assessing community leaders and formal representatives' perceptions, care was taken to ensure that true representation of all community members were included in the RAP. To ensure that equality in data was collected, leaders of each community plus additional women, men and youth focus groups were conducted. True participation can only be sought where the power dynamic is equally distributed to all and not only those already in power. It was seen that women's participation in leader groups was often largely token, which placed even greater importance on the inclusion of an additional women's focus group, given the need for community ownership of community problems where many women find themselves as household heads.

6. Other participants in the RAP included a variety of practitioners and local experts with experience of running EE projects alongside the formal education system. Other organizations consulted included the Department of Environment Information, Education, and Communication Unit, UNESCO, Mlup Baitong, and GECKO Environment Center. Other

individuals involved in both formal and non-formal forms of environmental, natural and conservation education were also consulted.

7. Unfortunately the timing of the RAP coincided with the middle of national school holidays so teachers were unavailable. Although a session for research was organized to coincide with a holiday teacher training workshop, the workshop date was moved forward so that it did not fit with the RAP. An October workshop was scheduled. Interviews were conducted with MOEYS curriculum developers and other organizations that work in formal education. Such interviews aimed to gain an insight in to how the PDA methodologies and tools can embrace teachers and build on their existing skills to equip them with the desire and tools to promote management of natural resources and biodiversity in the Tonle Sap Basin while reducing poverty and advocating for a more sustainable form of development.

8. For the purpose of having open discussion, maintaining trust and encouraging free participation, the community RAP was conducted in four communities in four clusters. A focus group was conducted separately with each cluster.

The clusters consisted of:

Cluster	**Number of participants in each focus group**	**Total number involved**
A women's focus group	7-10	40 women
A youth focus group	7-10	39 youth
A men's focus group	7-10	38 men
A community leaders focus group	7-10	34 leaders
		151 total community participants

All of the information from these clusters was collected in the vernacular (Khmer) and later translated to English.

9. Access to communities was sought through existing organizations working in the research communities. A day or a partial day of training was held with each of these organizations to enable comprehension of the PDA objectives and RAP methodologies. Members of these organizations aided the RAP through acting as note-takers. Further consultations on the barriers and opportunities for the PDA were conducted with these key organizations, which included Cambodia Family Development Services (CFDS), FAO Siem Reap, World Fish Organization, Osmose, and the Cambodian National Mekong Committee (CNMC).

10. The locations of the focus groups were free of noise and distractions from other community members. Schools, eco-tourist huts, and community fisheries sites were used as research venues. In this setting participants felt comfortable and relaxed. Participants were positioned in a circular shape encouraging participation and interaction. Each focus group took a minimum 45 minutes and a maximum 1hour and 20 minutes.

11. Each focus group consisted of topics of discussion that centered around six main axes:

- people's perceptions of uses of Tonle Sap water in the community,
- perceptions and awareness of range of problems that are linked to water usage,
- perceptions of how water related issues inhibit poverty reduction,
- perceptions of socio-environmental linkages and ability for futures thinking,

- perceptions of who makes decisions about the environment, and
- perceptions of how personal actions can be linked to environmental change (for more details on question topic guide see Annex 4).

12. A single facilitator was on site for all focus groups to ensure continuity in the research methodology and one or two staff members from the existing organization working in the community assumed the rotating position of note-taker.

13. The Focus groups differed from traditional structured interviews in several important ways. First, although the facilitator had some initial guiding questions or core concepts to ask, there was no absolute protocol to running the focus group. Second, the facilitator was free to move the conversation and ask further explanatory questions in any direction of interest that may be appropriate to the RAP. These deliberately open questions encouraged participants to share their attitudes and experiences with each other. The exchanges that occur between participants had the benefit of highlighting common experiences and views, identifying differences within the group, and acting as a stimulus to further thought among participants. Consequently, the research found that focus groups were particularly useful for exploring the RAP topics broadly whilst maintaining some structure but also allowing room for flexibility.

14. The focus groups also provided an opportunity for the researcher to observe social interaction and participation. The focus group was found to provide a stimulating environment for using the visual aid techniques i.e. picture stimuli and ranking cards, and for generating proposed EE&A strategies and needs for the future.

15. The researcher's role in the community was one of an observer. Direct observation differs from interviewing in that the observer does not actively query the community members as she did not speak Khmer. Observation is particularly important when the researcher is coming from a different culture in order to understand the context of the issues in the culture in which the research is conducted. The researcher tried to be as unobtrusive as possible so as not to bias the observations.

Underpinning methodology

16. The rationale for using the following research methodology based on grounded theory rests initially on two pillars, first that behavior is highly influenced by the naturalistic surroundings in which it occurs, and second that many qualitative methodologies are best suited to researching naturalistic settings. This validates the approach where elements of grounded theory will be the foundation of ideas, yet not constrictive, in constructing a workable methodology. The research utilized participatory methods that were tested and consequently deemed to be the most relevant and relaxed style suitable for use in the Tonle Sap context.

17. Some aspects of mainstream science were also incorporated into the research methodology, in particular for assessing quantitative data. Whether one assigns meaning to events through numbers or narrative, both styles of quantitative and qualitative inquiry can be empirical and scientific. Indeed contemporary NRM research methods do not fit neatly into one or the other camp, but recognize the usefulness of diversity in approach.

18. Grounded theory forms the basis for a qualitative research approach that was originally developed by Glaser and Strauss in the 1960s. It became a core concept of the research untaken. The self-defined purpose of grounded theory is to develop theory about phenomena of interest. But this is not just abstract theorizing. Instead the theory needs to be grounded or rooted in observation - hence the term.

19. Grounded theory is a complex iterative process. The research begins with the raising of generative questions that help to guide the research but are not intended to be either static or confining. As the researcher begins to gather data, core theoretical concept(s) are identified. Tentative linkages are developed between the theoretical core concepts and the data. Later on the researcher is more engaged in verification and summary.

20. While research approaches for addressing 'soft system' situations such as grounded theory should be seen as complementary to other science approaches, the differences between grounded theory and more mainstream science approaches should be noted.

Points of comparison	**Positivist science**	**Research based on grounded theory**
Relationship between researcher & participant	Positivist	Interpretivist
Researcher position	Removed/hard boundary	Soft boundary
Focus	On what is (prediction)	On what could be (possibility)
Value stance	Objective	Subjective
Data analysis/ collection	Quantitative	Qualitative
Aim	Prove/Disprove hypothesis	Look at the whole (issues based)
Application	Theoretical tool	Tool for social science

Accordingly many researchers try to bridge these chasms, and indeed the RAP included elements from both streams of thought.

21. Other modes of research do not necessarily embrace the principles of participation and collaboration and empowerment, like methodologies based on grounded theory.

Data collection and analysis techniques

22. The data was analyzed to underpin the development and testing of education and awareness tools and to permit monitoring and evaluation. Analysis of qualitative data could acknowledge and indicate where the structural components that limit action and restrict change lay. This qualitative data was intended to make learning methodologies and structures more responsive to the needs of communities. The data collection techniques chosen focused strongly on oral and visual communication; they did not depend on all participants being literate.

23. Data collection techniques included:

- creative techniques: involves open-ended visual tools such as community NRM picture stimulus to explore participant's ideas and ways of thinking about the environment,
- investigative techniques: included ranking cards designed to inquire into individual and group perceptions of who makes decisions concerning NRM in

relation to water, and

- analytical techniques: included gender and social status analysis and identification of environmental issues and their causes and solutions.

24. Data analysis integrated methods to validate the research findings through a dialectic process. There were several key analytic strategies:

25. *Coding* was used for both categorizing qualitative data and for describing the implications and details of these categories. Coding was used to find patterns in the data. The data was divided into concepts, categories of concepts, assigning properties to categories, and in some cases, dimension of properties along a continuum.

26. *Scaling* involved the construction of an instrument that associated qualitative constructs with quantitative metric units. Scaling was used in an attempt to measure the 'immeasurable', that is, measuring abstract concepts.

27. *Constant comparison* was employed to compare the findings of emerging data. The constant comparison method of data collection was used to distinguish similarities and differences in the data by establishing core variables by looking for patterns especially when talking with EE&A practitioners.

28. Validity was sought through Triangulation, that is, the use of two or more data collection methods/sources to establish research findings and minimize bias.

By implementing these methods, interpretational bias in findings were reduced.

Limitations

29. Focus groups are most often criticized for their lack of control over the environment being studied. However it often found that society cannot be fully understood until it is studied by those experiencing the situation. Another weakness of focus groups is the validity of findings, concerning the specific context and un-reproducible nature of the research. Personal over-involvement in focus group discussions can also be considered a weakness, to which personal biases can influence the conclusions of the bigger group. It became important to be aware of these issues and undertake other measures such as research note taking, triangulation and constant comparison methods in order to decrease their prevalence.

30. On a technical basis, the researcher's linguistic limitations (no command of the Khmer language) limited the quality of data collection and ability for in-depth analysis, as information was filtered through listening filters by a Khmer facilitator and Khmer note takers before reaching the researcher.

ANNEX 4

COMMUNITY FOCUS GROUP DISCUSSION GUIDE

General discussion guide for the community based RAP

Topic 1 Uses of water in the community

a) What do you use Tonle Sap water for in your community?

Topic 2 Perceptions of water related issues

a) Can you tell us what kind of issues/problems the water resource has in this area?

Topic 3 Perceptions of how water related issues inhibit poverty reduction

a) How do these water-related issues/problems impact your lifestyle/inhibit poverty reduction?

Topic 4 Perceptions of environmental/social linkages and futures thinking

Picture stimulus tool
a) If we look at this picture as being the Tonle Sap – what things can you see occurring and how do these things impact/affect the Tonle Sap?

b) What do you think might be the situation in 5 years time if things continue to degrade?

Topic 5 Perceptions of who makes decisions about the environment

Ranking exercise
a) We would like to know who makes decisions about the environment in the Tonle Sap. As a group please rank (or put in any order) these cards to show who makes the most decisions about the environment to the people who get the least say about environmental decisions. The whole group needs to agree on the placement of the cards.

Cards include: commune council, community members, provincial governor, district governor, community leaders, government, Department of Environment, Community Fisheries Committee and NGOs.

(People are asked for explanations why they put certain cards in certain places)

Topic 6 Perceptions of personal participation in environmental change

a) How could a national campaign empower your community to take action to change the situation related to water issues? – what tools/actions would you like to see come out of a campaign to assist (help) you make a difference?

ANNEX 5

LIST OF PEOPLE CONSULTED – AUGUST 2004

1. Dr Neou Bonheur	TSEMP Project Director
2. Dr Suporte	UNESCO, Education Program Specialist
3. Loeung Kesaro	UNDP Capacity Building for Sustainable Development in the Tonle Sap.
4. Gordon Claridge	TSEMP Policy & Strategy Advisor
5. Sou Sovouth	Ministry of Environment, Director of Information Education & Communication Unit
6. Mr Eng Kimsan	Ministry of Environment, Chief Officer at IEC Unit
7. Hay Ngorn Touch	Ministry of Education Youth and Sports, Department of Pedagogical Research, Deputy Chief of Curriculum Development
8. Nareth Polyvine	Ministry of Education Youth and Sports, Department of Pedagogical Research, Science curriculum writer
9. Hanneke Nooren	Wildlife Conservation Society, Environmental Education Specialist
10. Imke Gisling	UNESCO, Environment & Science Unit
11. Amanda Bradley	Mlup Biatong, Advisor
12. Lov Sam nan	Cambodian Family Development Services, Pursat Province Manager
13. Patrick Evans	FAO participatory NRM in TSR Project Leader
14. Has Piron	GECKO Environmental Education Center, Manager
15. Thlan Borin	GECKO Assistant
16. Kao Yada	Osmose, Education Coordinator
17. Heng Dara	Osmose Project Officer
18. Ek Heng	World Fish Centre, Project Coordinator
19. Thinny Sothy	World Fish Centre, Project Officer
20. Duk Phon	World Fish Centre, Project Officer
21. Chheng Vibalrith	World Fish Centre Project Coordinator
22. Prach Sokunthy	Cambodian National Mekong Committee, Provincial Supervisor
23. Marina Ocampo	Provincial Dept of Fisheries Information & Coms Advisor
24. Clayton Hawkes	Community Fisheries Officer, Dept Fisheries
25. Laska Sophal	Department of Environment Technical General Directorate, Director General's Assistant