Economy and Environment Program
for Southeast Asia
22 Cross Street #02-55
South Bridge Court
Singapore 048421

Phone : (65) 6438 7877
Fax : (65) 6438 4844
E-mail : hfrancisco@idrc.org.sg
Web site : www.eepsea.org

The Economy and Environment Program for Southeast Asia (EEPSEA) was established in May 1993 to support training and research in environmental and resource economics across its 9 member countries: Cambodia, China, Indonesia, Laos, Malaysia, Papua New Guinea, the Philippines, Thailand, and Viet Nam. Its goal is to strengthen local capacity for the economic analysis of environmental problems so that researchers can provide sound advice to pollcymakers.

EEPSEA Policy Briefs summarize the key results and lessons generated by EEPSEA supported research projects , as presented in detail in *EEPSEA Research Reports.*

EEPSEA Policy Briefs and Research Reports are available online at http://www.eepsea.org

Can Information Help Communities Adapt To Sea-level Rises – A Case Study From China

EEPSEA POLICY BRIEF • No. 2010-PB6

Globally, sea levels are rising as a result of global warming. One country that is being particularly badly affected by this challenge is China, where sea levels are rising at a faster-than-average rate. It is therefore vital that China's coastal communities are able to adapt to these changes. To assess the readiness of such communities to act and to see how they could be helped, a new EEPSEA study looks at how local decision →

A summary of EEPSEA Research Report No.2010-RR6: 'Assessing the Effects of Information Provision on Policy Decisions Related to Adaptation to Sea-Level Rise in Zhejiang Province, China' by Jin Jianjun, College of Resources Science & Technology, Beijing Normal University, No.19, Xinjiekouwai Street, Haidian District, Beijing, 100875, China
Tel: + 86-10-58805049 Fax: +86-10-58805726
Email: jjjin@bnu.edu.cn

" government agencies should ...

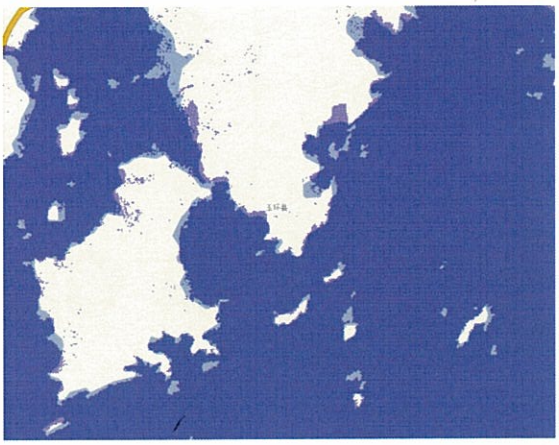
makers in coastal communities perceive and respond to the sea-level rise issue. It also investigates the effects of information provision on decision-makers' opinions and actions.

The study is the work of Jin Jianjun, from the College of Resources Science & Technology at Beijing Normal University. It shows that local decision makers do not place a high priority on the sea-level rise issue. It also shows that providing local decision makers with relevant information raises their awareness of the need to act. However, it also shows that such information does not necessarily lead to action. The study therefore recommends that, alongside increased information provision, local and national government agencies should provide more direct financial and technical assistance and offer more leadership and direction.

The Sea-Level Challenge

China has 32,000 km of coastline. Its coastal areas are home to 40% of the nation's population, contribute to nearly 55% of its Gross National Product and hold 70% of its medium- and large-sized cities. Rising sea levels are therefore a key issue for the country. Urgent action is required, as coastal sea levels in China are rising at 2.5 mm per year on average.

In order to design effective policies to help coastal communities adapt to sea level rises, it is vital to know what local decision makers think about the issue. Assessing this knowledge was therefore one of the key goals of this study. Many other researchers have shown that providing relevant information has a positive effect on environmental decision-making. Another key objective of this study was therefore to see how the provision of pertinent information affects the decisions community leaders make about sea level rise adaptation.



The picture showing possible inundated areas in Yuhuan County
Note: The lightly shaded areas along the coastline are the possible inundated areas

Zhejiang Province – at Risk from Rising Sea Levels

The study assesses the views of local village leaders from 21 towns located on islands in Zhejiang Province. Zhejiang Province is situated along the southeast coast of China. It is one of the most densely populated provinces in China. In recent decades, Zhejiang has experienced rapid economic growth. From 1978 to 2002, its GDP increased annually at a rate of 13% and its per capita GDP rose at an average annual rate of 12%. According to the 2006 Sea Level Report in China, the sea level in Zhejiang's coastal areas rose by 3.3 mm per year from 2004 to 2006, which was the highest rate in China.

Three kinds of towns (tourism, fishery, and commercial towns) were selected. This was done to see whether village leaders from different kinds of towns have different levels of knowledge about rising sea levels and to see whether they are taking different steps to adapt. Within each town, three villages were selected. These villages were randomly assigned to one control group or one of two experimental groups. The villages in the experimental groups were provided with a detailed information brochure on sea-level rise and how they could adapt; the villages in the control group did not receive any information.

What Do Decision Makers Think About Rising Sea-Levels?

The study started by collecting base-line data. To do this, village leaders in all the participating communities (both in the control group and the two experimental groups) were interviewed to find out how much they knew about global warming, rising sea levels and to see what was being done to adapt.

Once the questionnaire had been completed, presentations on rising sea levels and adaptation were made to village leaders in the

provide more direct assistance."

communities in the experimental groups. Subsequently, each of these village leaders received an information brochure which gave in-depth information on the sea-level challenge, its causes and impacts, and on how communities should respond and adapt.

Community leaders in all of the villages in the experimental groups were given a month to read and assimilate the information provided before they were interviewed again. Three outcomes were measured: Did local decision makers use the information provided? Did local decision makers change their knowledge, perceptions, and attitudes on rising sea levels and adaptation after they had read the information? What kind of policy action was taken after they had taken the information on board? The study also assessed whether information on sea-level rise had been fed down from village leaders to individual households.

A Clear Lack of Knowledge and Concern

It is clear that most village decision makers only have a little knowledge of global warming and rising sea levels. For example, only about 24% of respondents in the first "base line" phase of the study gave the correct answer to the possible effects of global warming, and less than half (44%) knew about the various types of greenhouse gases. Overall, the local village leaders were not very concerned about rising sea levels and adaptation. Rising sea levels ranked low in importance compared with other environmental problems such as water pollution and solid waste management. It is also clear that villagers had little knowledge of the sea-level rise issue and that few of them had received information on the issue and on how to adapt from their village councils.

The preliminary survey results revealed that the main source of information about rising sea levels is the mass media. Almost half (48%) knew about sea-level rise through television. Respondents' age and education levels, as well as the category of town they lived in, had a definite impact on their knowledge of the sea-level rise issue. The younger and more educated village leaders from tourism and commercial towns tended to have a better knowledge of the issue compared with older and less educated respondents from fishery towns. Thus, increased investment in education and communication programs could be one way in which to enhance the knowledge and perceptions of local officials about rising sea levels and adaptation.

Decision makers were asked what information would help their communities adapt to rising sea levels. They highlighted the need for information on issues such as the relevant laws and policies being pursued by central government, on the possible threats of posed by rising sea levels and on specific adaptation measures they could take.

Why No Action?

It is clear that community leaders have not done much to react to or adapt to the sea-level rise challenge. For example, only around 22% of the respondents stated that they had

Questions	Control group		Experiment group		Total sample	
	N	Correct response (%)	N	Correct response (%)	N	Correct response (%)
1. Causes of global warming	21	13(62%)	42	34(81%)	63	47(75%)
2. Effects of global warming	21	4(19%)	42	28(67%)	63	32(51%)
3. Types of greenhouse gas	21	7(33%)	42	38(90%)	63	45(71%)
4. Awareness of sea-level rise	21	15(71%)	42	42(100%)	63	57(90%)
5. Causes of sea-level rise	21	6(29%)	42	34(81%)	63	40(63%)
6. Effects of sea-level rise	21	10(48%)	42	37(88%)	63	47(75%)
7. Sea-level rise situation along Zhejiang coast	21	9(43%)	42	40(95%)	63	49(78%)
8. Sea-level rise is good for groundwater pumping.	21	16(76%)	42	40(95%)	63	56(89%)
9. Sea-level rise can decrease the intensity of typhoons or storm surges.	21	13(62%)	42	38(90%)	63	51(81%)
10. Sea-level rise can deepen the navigation channel.	21	11(52%)	42	35(83%)	63	46(73%)
11. Sea-level rise can cause soil salinization.	21	20(95%)	42	41(98%)	63	61(97%)
Overall average	21	11(54%)	42	37(88%)	63	48(77%)

Knowledge of global warming and sea-level rise in Phase II (percentage of respondents with the correct answer)

discussed the issue within their village councils (this was before any leaders had seen the information brochure). About 8% of village leaders stated that they had highlighted the problem of rising sea levels to higher-level government units. In terms of the actions they could take, most of the respondents (68%) stated that they could plant more trees and do more to protect the environment.

When decision makers were asked why they had not taken more action on sea-level rise adaptation, 38% of the respondents said that it was because rising sea levels was not considered an urgent problem in their villages. Just under a third (31%) said that the main problem was a lack of money and staff for sea-level rise adaptation measures, while 26% said their higher-level government units paid little attention to the issue and did not ask them to take any action. The remaining 5% stated that their knowledge on rising sea levels was not detailed enough for them to take any action.

Does Information Make a Difference?

When the study assessed the impact of the information brochure that was distributed to village decision makers, it turned out that almost all the village leaders had read the whole brochure; only one village leader reported not reading it. This implies that community leaders were very interested in the brochure and the information it contained.

It is clear that the provision of information improved village leaders' understanding of global warming and the sea level rise challenge and that it changed the way in which they perceived the threat. For example, before they had seen the brochure only around 35% of the respondents in the experimental groups agreed that rising sea levels are an important problem; once they had seen the brochure more than half of the respondents in the experimental groups (64%) thought this way.

The majority of village leaders said that the information brochures were helpful to them. However, only 12% of the village leaders said that the brochure had affected the actions that their villages had taken. About 43% stated that the information brochure would affect their policy actions in the future.

How to Improve the Situation

It is clear that village leaders should be provided with more information on related laws and policies of central government, the possible threats of rising sea levels, and details of the specific sea-level rise adaptation measures they can take. As previously stated, the main source of information for village leaders and the general population about rising sea levels is the mass media. Based on this, the mass media (especially television) should be used more effectively to improve the perception, knowledge and awareness of local decision makers and communities about the issue and how they can adapt.

It is clear that providing communities with information on rising sea levels and adaptation increases their knowledge significantly and changes their attitudes towards the issue and adaptation. However, the study shows that receiving relevant information (in this case information brochures) did not make a significant number of local village leaders take specific policy actions to adapt to the sea-level rise challenge. This was despite the fact that the information brochure had been well received.

This lack of action is partly due to the fact that top-down planning is still a very prominent feature of the Chinese government system. This means that information provision cannot be the sole approach used to get village leaders to address the sea-level rise challenge. The provision of an appropriate level of financial assistance, the availability of technical staff, and policy support are equally important measures that should be introduced. These factors need to be taken into account when and if any plans are developed to increase the adaptive capacity of local government units to cope with the sea-level rise challenge.

EEPSEA is administered by Canada's International Development Research Centre (IDRC) on behalf of EEPSEA's sponsors:

Sida

Canadian International Development Agency | Agence canadienne de développement international

IDRC CRDI