

PEOPLE-CENTRED APPROACHES TO WATER AND ENVIRONMENTAL SANITATION

Participatory village surveys in water resources management – case from Tonle Sap Lake

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Integrated water resources management asks for comprehensive approach combining hydrological data with environmental, economic and social information. Understanding the interconnections between water and social factors is prerequisite for sustainable and socially just water resources management. Still, in many water management projects this linkage remains inadequately understood and analysed. In addition, participation of local people is often lacking or, at best, forms only separate part of the project. This paper presents experiences from the participatory village surveys carried out in the Tonle Sap Lake, Cambodia within a consultancy project under the Mekong River Commission. The village surveys were together with socio-economic databases used to achieve up-to-date picture on the socio-economic situation in the Tonle Sap Area. Although participation of the local people in the project is still far from perfect, the village surveys illustrate how invaluable the local people's participation and knowledge is and what kind of benefits it can bring.

Introduction

Understanding the interaction between the environment and human beings is an absolute necessity for successful water resources management. Social and economic issues need not only to be addressed but also integrated into both planning and implementation of the water management projects.

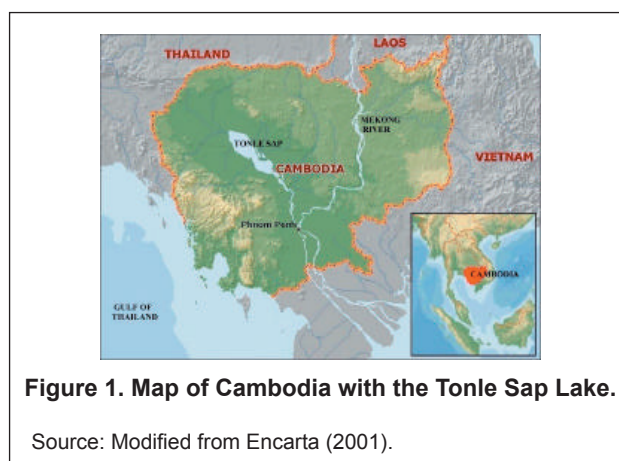
Participation of the local people offers best way to gain knowledge on social issues and their interconnections with water and environment. In this way, the needs and expectations of local people can also be taken into account in better way.

This paper presents lessons learnt from the socio-economic analysis of the Tonle Sap Lake in Cambodia. The socio-economic analysis was carried out as a part of the Tonle Sap Modelling Project (WUP-FIN) that is a complementary project for the Mekong River Commission's Water Utilisation Programme (WUP).

The main aim of the project is to create means to understand physical, chemical and biological processes in the Tonle Sap Lake and to assist in the maintenance of sustainable conditions of the lake (MRCS/WUP-FIN 2003). To achieve this, the project has developed three-dimensional hydrological models that are complemented with environmental and socio-economic surveys and analyses.

Cambodia and the Tonle Sap Lake

Although relatively rich in natural resources, Cambodia is among the poorest countries in Asia. Most of the population is still heavily dependent on common natural resources for their livelihood. More than 70% of the working force works in the agricultural sector although agriculture's proportion from country's GDP is decreasing with rapid development



of industry and service sector (World Bank 2002).

The Tonle Sap Lake, known also as the Great Lake, lies in the central plains of Cambodia (Figure 1). The lake is known for its rich biodiversity and extraordinary water regime with huge changes in the water level and volume. During the southwest monsoon the water level in the Mekong River rises so fast that part of the floodwaters run to the Tonle Sap River that connects the lake to the Mekong. This causes the Tonle Sap River to reverse its flow back towards the Tonle Sap Lake.

As a result, the water depth in the lake rises from 1 meter up to 10 meters and the surface area expands from 2500 km² to approximate 11 000 km², extending the lake over vast floodplains consisting of flooded forests, shrubs and rice fields (MRCS/WUP-FIN 2002).

The extraordinary water regime of the Tonle Sap Lake and Rives has resulted in exceptional biodiversity and in unique and highly productive aquatic ecosystem. Migration of differ-

ent fish species and other aquatic animals between the Tonle Sap Lake and the Mekong River is extensive and diverse and the Tonle Sap Lake is extremely important fish breeding ground for entire Mekong (Lamberts 2001). The lake also has one of the richest stocks of water birds in Asia and it is home to a variety of mammals, reptiles and insects.

The Tonle Sap Lake has thus a significant role for entire Mekong Basin and it can be well described as the Heart of the Mekong. Its significance is even greater for Cambodia. It is approximated that almost half of the country's population benefits directly or indirectly from lake's resources. The Tonle Sap Lake and Tonle Sap River also offer the most important source of livelihood for up to one million people (Bonheur 2001).

The main source of livelihood in the area is usually either fish or rice: while people living close to the Tonle Sap Lake depend strongly on fish, majority of the people in the area actually live further away from the lake and have rice cultivation as their main source of income.

Although blessed with relatively abundant natural resources, the region still remains among the poorest in Cambodia. This extreme poverty together with significant dependency on natural resources is particularly alarming since availability of all important natural resources are in a clear decline.

The main reason for the decline of the natural resources is overexploitation that is caused by the combination of poor management, poverty and population growth. This kind of unsustainable combination has resulted in the decrease of the level of livelihood throughout the study area. Thus, the successful management of the Tonle Sap Lake and its vast natural resources demands deep understanding of environmental and social issues and their interconnections.

Structure of the socio-economic analysis

The socio-economic issues in the Tonle Sap Area are extraordinarily diverse and complex. This is due to various reasons that include the unique nature of the lake and its floods, peoples' deep dependence on the lake and other natural resources, and area's growing population and massive incidence of poverty. Cultural and ethnic divisions, remarkable seasonal variations of livelihood sources and unequal access to natural resources add their own problems into this complex soup.

The complexity of the socio-economic situation combined with lack of firm and up-to-date information means that the socio-economic analysis had to be exceptionally extensive. Thus, socio-economic analysis of the area made use of various different sources of information and combined different kind of approaches in order to gain as extensive picture of the area as possible. The survey consisted of three main components:

- Participatory village surveys and their analysis
- Review and analysis of quantitative socio-economic databases and creation of new GIS-based socio-economic database

- Review and analysis of other sources of information, consisting of literature review and expert interviews

These three main components were in final socio-economic analysis combined and analysed according to topographic and urban zones. The zoning enabled integration of the socio-economic analysis results with hydrological data. This paper presents, however, experiences only from the participatory village surveys. For further information on whole socio-economic analysis and on integration of the socio-economic and hydrological data, please refer to Keskinen (2003).

Participatory village surveys

Participatory village surveys conducted within the socio-economic analysis of the WUP-FIN Project were based on different rapid and participatory rural appraisal (RRA and PRA) methods. However, due to the nature of the entire project, village surveys were used to get better understanding of the local realities – not for the empowerment and development of the villages as such which is the aim in true PRA (Chambers 2002).

Approach of the village surveys is therefore inevitably more extractive and thus closer to rapid rural appraisal (RRA) than PRA. This, of course, should not prevent us from using methods based on participatory methodologies to benefit both survey (via better understanding of the local situation) and the villagers (via enhanced participation in the project).

Altogether six participatory village surveys were carried out in the villages situated in different topographic zones around the Tonle Sap Lake with each of the surveys lasting 4 to 5 days. This is naturally an extremely tiny sample as there are more than thousand villages in the entire Tonle Sap Area. Nevertheless, the village surveys proved to add significantly to the extensive socio-economic information drawn from the socio-economic databases. In addition, the village surveys revealed several inconsistencies and even mistakes in the socio-economic databases.

The main focus of the surveys was on occupations and their seasonal variation, use of natural resources and on environmental trends. In order to get better hold on seasonal variation, three village surveys were conducted during the dry season when the lake was its shallowest, while three latter ones took place just after the rainy season and peak of the flooding.

The village survey team consisted of two Cambodian socio-economists working full-timely for the project, two local team members from provincial ministries and/or NGOs and one international socio-economist (the author). The language of the surveys was naturally Khmer.

Participatory methods used in the village survey were, in chronological order:

- Key informant interview (semi-structured interview)
- Group discussion (semi-structured interview)
- Participatory mapping

- Transect walk and observation
- Seasonal calendar and occupational preference ranking
- Time ranking
- Final discussion and analysis of the study

The idea was to use the key informant interview to collect more overall information on socio-economic situation in the village. Key informants included usually village chief, members of village development committee and a village elder. The group discussion focused then on main indicators of the village survey, such as livelihood and their seasonal variation, natural resources and environmental trends.

With the help of the results from semi-structured interviews, participatory mapping and a transect walk, survey was then concentrated on the issues of seasonality and recent changes in livelihood and environment. This was done using two different ranking exercises, namely seasonal calendar and time ranking. Final analysis with all participants concluded the survey with a discussion about the results of the survey.

Each of the village surveys was documented in village survey report that was written in both Khmer and English. In addition, results from all village surveys were analysed together in a concluding report. In this synthesis report, the data achieved from the ranking exercises was analysed with the help of different kind of illustrations such as diagrams (Figures 3-5).

Although location and occupational structure of the survey villages varied widely, many of the survey results were very similar in every survey village. Figure 3 presents the trends of some of the surveyed factors in survey villages. Figure shows a very clear and alarming overall trend. While population in every village is increasing, majority of the natural resources as well as the level of livelihood are in a clear decline.

This kind of development trend is obviously unsustainable and implicates that the villagers will in future face serious problems and limitations with their livelihood options. The similar kind of trend had been noticed also from the socio-economic databases and the results of the village surveys therefore supported this assumption.

	Kampong Preah	Preak Ta Kong	Ansang Sak	Kampong Pradam	Peam Kraeng	Pou
Population	↗	↗	↗	↗	↗	↗
Level of livelihood	↘	↘	↘	↘	↘	↘
Fish catch	↘	↘	↘	↘	↘	↗
Area of flooded and other forest	↘	↘	↘	↘	↘	↗
Availability of agricultural land		↘	↘			
Amount of cattle		~	~	↗	↗	
Flooding	↗	↗	↘	↗	↗	↗
Water quality	↘	↘	↘	↘	↘	↘
Sedimentation	↗		↗	↗		↗

Figure 3. Trends of different natural resources and socio-economic factors.

Source: Keskinen (2003).



Figure 2. Villagers preparing seasonal calendar in the village of Kampong Preah.

Photo: Marko Keskinen

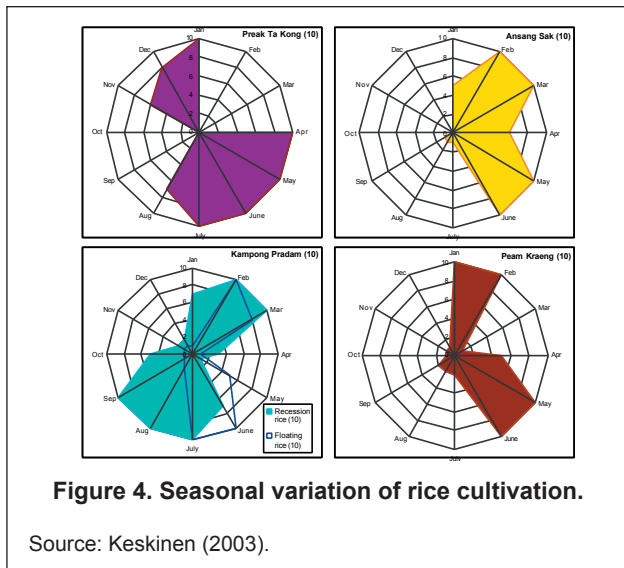
Figures 4 and 5 present examples from the result of the seasonal calendar rankings. Figure 4 shows the seasonal variation of cultivation of wet-season rice in four survey villages while Figure 5 presents the seasonal variation of level of livelihood in different survey villages.

As can be seen from Figure 4, the rice cultivation concentrates strongly on two periods, sowing and harvesting. When all seasonal diagrams of occupations were analysed together, it was noted that the involvement in different occupations concentrated basically rather evenly to different seasons. However, the most intense involvement in the Tonle Sap Area’s main sources of income, rice cultivation and fishing, overlapped significantly between December and February when rice is harvested and fish is caught in large quantities as they migrate back to the Mekong River.

This kind of notable seasonal variation of different occupations as well as partly overlapping of the involvement in the main occupations remained unnoticed by all socio-economic databases. The village surveys thus improved significantly the understanding of strong seasonality of the area’s livelihood sources and also illustrated strong connection between the people’s livelihood and natural resources.

The overlapping of the main occupations naturally causes sudden rise in the level of livelihood at the beginning of year. During the other periods villagers have to rely on less-important occupations like firewood harvesting and vegetable cultivation, and the level of livelihood is therefore remarkably lower (Figure 5). This kind of strong dependency on certain season with partly overlapping involvement in main occupations makes the villages vulnerable to the sudden changes in the natural conditions like rain and floods.

This kind of dependency is particularly alarming since the group discussions revealed that the majority of the villagers in each village depend more or less on same occupations for their livelihood. Thus, the much discussed diversity of livelihoods is actually much greater inside each household than within each village. This means that if the main source of livelihood for the village fails (e.g. rice harvest is destroyed due flooding), the majority of the villagers lose their main income. In this kind of situation practically the entire village have to find alternative sources of income (e.g. fishing,



firewood collection) that puts these natural resources under severe stress and can result in serious conflicts. For more information on village survey results and their analysis, please refer to Keskinen (2003).

Lessons learnt

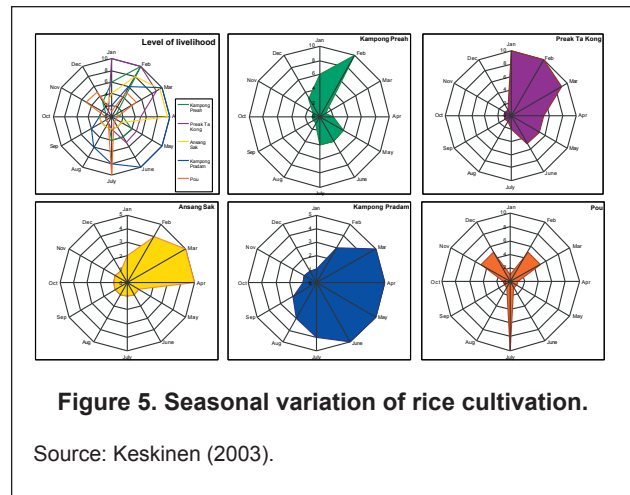
What was learned from the participatory village surveys? Many things. Although the village surveys formed only small part of the entire socio-economic analysis, they nevertheless presented invaluable information on various different issues. Participatory village surveys were extremely important in improving the understanding of complex interactions between people's livelihood and environment.

Most importantly, village surveys illustrated the great seasonal variation of the livelihoods that was not addressed in any of the databases. The village surveys pointed out other discrepancies and lacks of the databases while on the other hand also supporting most of the databases' information. Thus, participatory village surveys added significantly to the socio-economic analysis of the area.

Participatory village surveys also encouraged and enhanced the participation of local people and thus helped to take into account their needs and expectations. However, the local people's participation in the entire socio-economic analysis and project remained weak and this should definitely be improved in the future. Village surveys can also be said to improved the cooperation and understanding between ministries in Phnom Penh and their provincial line agencies, NGOs and the villagers as they all participated in the village surveys and discussed together about the area's problems. This kind of cooperation is unquestionably needed between the villagers, the government and local and international NGOs in order to ensure more sustainable management of the natural resources in the village and commune levels.

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