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*Livelihoods Component*

**ENABLING ALTERNATIVE LIVELIHOODS  
FOR AQUATIC RESOURCE DEPENDENT  
COMMUNITIES OF THE TONLE SAP**

**SUMMARY RESEARCH NOTE**

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## I INTRODUCTION

1. This research note is provided as a supplement to the technical report, "Influence of Built Structures on Livelihoods: Case Studies of Road Development, Irrigation, and Fishing Lots,"<sup>1</sup> as part of the livelihoods component of the "Study of the Influence of Built Structures on the Fisheries of the Tonle Sap"<sup>2</sup>. The technical report assesses possible changes in people's livelihood strategies and outputs, including those derived from fisheries, particularly in terms of changes in livelihood portfolios, vulnerability, resource access and income. It also summarises local people's perception of the connections between their livelihoods, environment, aquatic ecosystems and built structures, as well as their viewpoints on best practices for built structures with a specific focus on institutional arrangements.
2. As described in the main technical report, all three study sites show an overall decline in fishing as a proportion of household income, a trend that is consistent with reports of a declining catch per household from other areas around the Tonle Sap. In such a context, the ability of poorer households in particular to diversify their livelihood portfolios, reducing their dependence on the natural resource base, is a key factor in reducing vulnerability.
3. In developing recommendations to improve the ability of rural households to diversify their livelihoods, it is important to understand what the livelihood priorities are for local communities, what alternatives are available, and what constraints prevent some households from taking advantage of these alternatives. This research note is meant to answer these questions.
4. In preparing this research note, data collected through the household surveys<sup>3</sup> was analyzed with specific reference to these questions, and to identify issues for focus group discussions among selected survey participants. Focus group discussions were organized in two villages in each of the three study sites<sup>4</sup>, with participants selected to have a balance in gender and wealth groups (poorer, medium, and richer). The village chief and vice-chief were also included in each focus group, for a total of 10-12 people per group. Existing and alternative livelihood scenarios were discussed and evaluated by the focus group participants. Constraints to livelihood diversification were identified and ranked, as well as suggestions about addressing these constraints.

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<sup>1</sup> Ratner, B. D., D. B. Rahut *et al.* 2007. "Influence of Built Structures on Livelihoods: Case Studies of Road Development, Irrigation, and Fishing Lots." Technical Report. Asian Development Bank TA 4669-CAM.

<sup>2</sup> Asian Development Bank TA 4669-CAM. Financed by the Government of Finland, with the Cambodian National Mekong Committee as executing agency and the WorldFish Center as implementing agency.

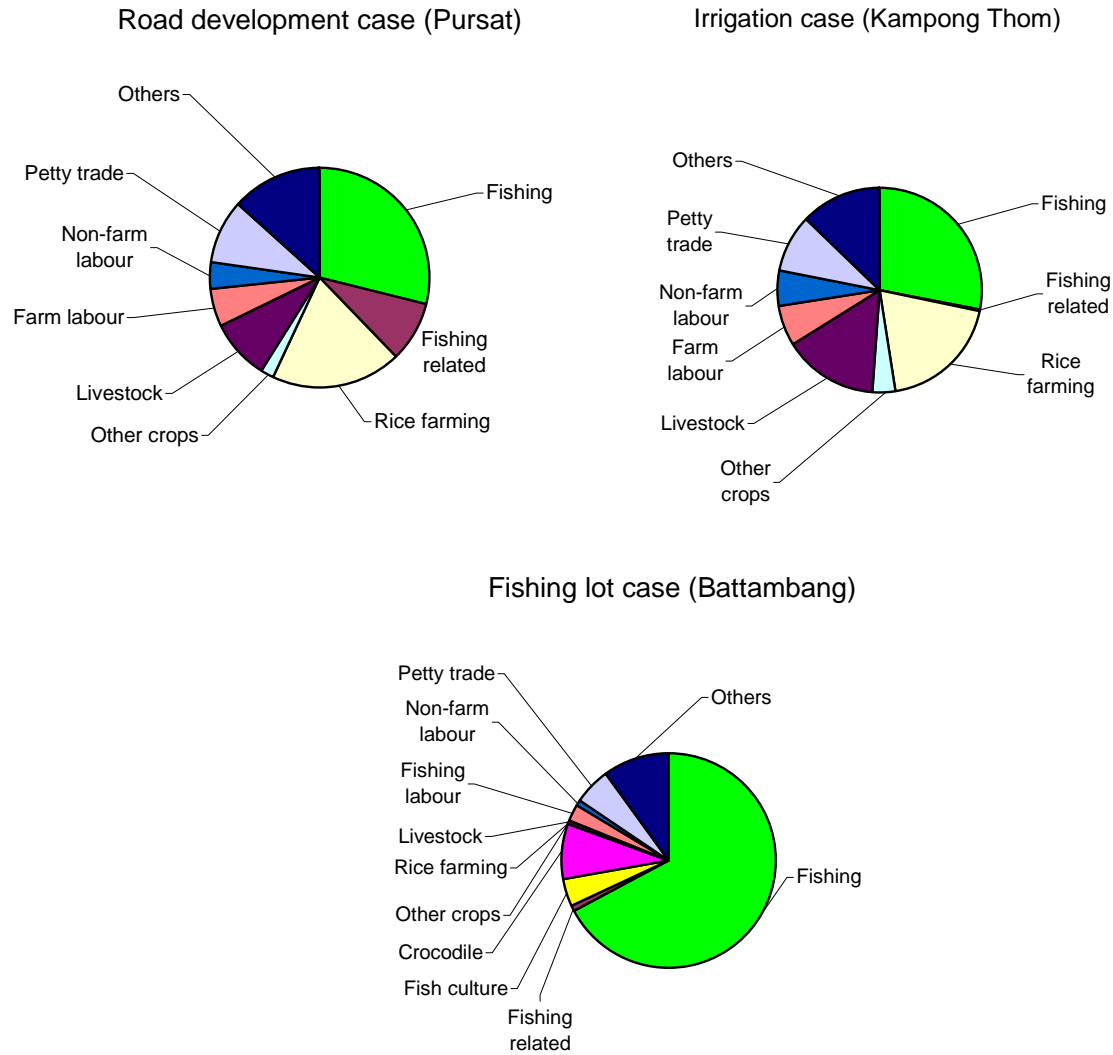
<sup>3</sup> For a description of the methodology used in the household surveys, please see the main technical report.

<sup>4</sup> The villages are Chong Khlong and Ou Ta Prok in Ou Sandan commune, Krakor District, Pursat province (road development case study), Snao and Sa'ang villages in Kampong Thma Commune in Santuk District, Kampong Thom province (irrigation development case study), and the floating villages of Prek Toal and Thvang in Kaoh Chiveang commune, Aek Phnum district, Batambang province (fishing lot case study). For a description of the study sites and their socioeconomic characteristics.

5. The results of these discussions have been integrated into the recommendations of the main report addressing investment in household assets to better enable poorer households to take advantage of alternative livelihood opportunities.
6. The research note is organized according to the three questions addressed: (i) What are the current livelihood activities in the study sites? (ii) What are the preferred livelihood activities? (iii) What are the constraints associated with livelihood diversification, and what do locals see as priorities for overcoming these constraints? In addressing each question, we note differences by income group, and where relevant, by gender.

## II CURRENT LIVELIHOOD ACTIVITIES

7. **Fishing is the most important source of household income in all three study sites.** The contribution is of course highest in the floating villages of Battambang, where fishing accounts for about 67 percent of total household income. But even in the road development (Pursat) and the irrigation (Kampong Thom) cases, where almost all households (90 percent) are rice farmers, fishing still accounts for a higher percentage of household income than rice farming (28-29 percent from fishing versus 19 percent from rice farming in both cases). (See Figure 1.)
8. In terms of the percentage of households participating, the most prevalent livelihood activities in the road development (Pursat) and irrigation (Kampong Thom) cases are rice farming, fishing, and livestock rearing, in that order. In the fishing lot case (Battambang), fishing is the most prevalent, with virtually all households participating, and fish labour is the second most common livelihood activity (with 29 percent of households participating).
9. **Besides fishing, rice farming and livestock rearing, households in the study sites are engaged in a wide variety of other livelihood activities.** These can be categorized as fishing-related activities (such as fish processing, making and repairing fishing gear), other crops (such as corn and vegetables), farm labour (wage labour in agriculture), fishing labour (including wage labour with the fishing lots), non-farm labour (wage labour outside the fishing and agriculture sectors), and petty trade (including marketing and selling of groceries, fish, agricultural products, and other goods).
10. **There are consistent gender differences in many livelihood activities.** The following activities are predominately male: fishing, fishing labour, carpentry, poultry and livestock rearing, buying and selling livestock, and serving as porters. Women are engaged in selling fishery and agricultural products in the public markets and operating neighborhood convenience stalls, tending to gardens and various vegetable crops, and collecting rattan and various other natural resources. Many other livelihood activities commonly have participation of both men and women.



**Figure 1. Household income portfolios in the three study sites.** Shows the percentage of average household income contributed by each category of livelihood activity.

11. **Even in nearby villages, the pattern of livelihood activities among richer or poorer households varies significantly.** The following analysis examines the percentage contribution to total household income by dividing households into three income groups (terciles) and comparing these groups.<sup>5</sup> While one might expect, for example, that the higher income households consistently rely more on petty trade and less on fishing as a source of income, the analysis

<sup>5</sup> It is important to note that these income groups (terciles) are formed by dividing surveyed households *within each village* according to current annual income. This is useful in making comparisons to assess the relative importance of different livelihood activities to each income group. But keep in mind that the groupings are relative to other households in the same village, such that in a village with overall lower income (Chong Khlong, for example), households in the “higher income” group in fact earn less on average than households in the “medium income” group in Prek Toal, where overall incomes are higher. For analysis based on an absolute measure of poverty (the national poverty line), see the main technical report.

shows that the pattern is inconsistent from one village to the next. This implies that even nearby villages have a significantly different local context influencing livelihood choices.

12. **In the road development case study (Pursat), fishing is a more significant income source for poorer villagers in one village near the road, while in a nearby village the opposite is true.** Poorer households in the Cham village near the road (Chong Khlong) derive slightly more income from fishing while in the Khmer village (Ou Ta Prok) richer households derive significantly more of their income from fishing activities. In Chong Khlong the poorer households derive significantly more of their income from rice farming, but in Ou Ta Prok each of the income groups derives about the same proportion of their income from rice farming. In Chong Khlong petty trade seems to be dominated by the higher income households but in Ou Ta Prok, it is the poorer households who depend more on petty trade. (See Table 1.)

Activities	Chong Khlong			Ou Ta Prok		
	Lower	Middle	Upper	Lower	Middle	Upper
Fishing	36.7	33.6	30.5	17.3	20.9	27.8
Fishing related activities	10.7	18.9	11.0	0.0	1.3	2.7
Rice farming	33.1	25.0	12.3	25.3	22.4	23.1
Other crops	1.8	3.3	2.0	1.7	1.3	1.1
Livestock	7.9	8.7	1.5	19.2	17.9	16.9
Farm labour	1.3	1.9	11.2	4.0	1.7	0.8
Non-farm labour	2.6	0.0	4.7	3.0	1.4	7.1
Petty trade	0.0	1.2	12.2	20.2	10.6	8.8
Other	6.1	7.4	14.9	9.3	22.5	12.0

**Table 1. Household income portfolios by income group (tercile) for villages studied in the road development case study, Pursat**

13. **In the irrigation case study site (Kampong Thom), rice farming represents a significantly higher proportion of income for poorer households.** In the end-user village (Sa'ang), fishing is significantly more important to the richer households, while in the head-user village (Snao) no such distinction is evident. (See Table 2.)

Activities	Snao			Sa'ang		
	Lower	Middle	Upper	Lower	Middle	Upper
Fishing	26.0	30.4	25.6	12.1	22.8	36.7
Fishing related activities	0.1	0.0	0.3	0.3	0.9	0.3
Rice farming	34.3	21.3	14.6	30	25.2	15.8
Other crops	2.5	3.7	3.8	7.1	5.1	1.7
Livestock	9.0	14.2	18.4	13.7	9.7	14.9
Farm labour	7.0	3.4	0.3	18.1	5.3	15
Non-farm labour	7.5	18.4	5.7	1.6	2	0.1
Petty trade	0.0	4.8	17.2	4.9	1.2	7
Other	13.5	3.7	14.2	12.1	27.7	8.4

**Table 2. Household income portfolios by income group (tercile) for villages studied in the irrigation case study, Kampong Thom**

14. **In the floating villages in Battambang, fishing is the dominant source of income for richer and poorer groups alike.** Crocodile culture is important to

richer households only, and fishing labour is an important income source primarily for poorer households. (See Table 3.)

Activities	Prek Toal			Thvang		
	Lower	Middle	Upper	Lower	Middle	Upper
Fishing	66.8	71.1	61.4	58	85.9	65.9
Fishing related activities	5.1	0	0	1.5	0	0.5
Fish culture	7.3	5.5	6.4	10	1.2	2.3
Crocodile	0	0	7.8	1.5	0	16.3
Rice farming	0	0	0	0.5	0	0
Other crops	0	0.7	0.2	1.9	0	0
Livestock	0	0	0	0.6	0.2	0.8
Fishing labour	11.6	0.8	6.2	2.6	0.9	0.4
Non-farm labour	0	0	0	11	1.1	0
Petty trade	0.4	6.1	0.2	0	0	12.8
Other	8.8	15.8	17.8	12.4	10.8	1.4

**Table 3. Household income portfolios by income group (tercile) for villages studied in the fishing lot case study, Battambang**

### III PREFERRED LIVELIHOOD ACTIVITIES

15. **When asked about diversifying their livelihoods, people in the study villages typically look to activities that are already established in the area,** meaning that someone has already demonstrated the option to be economically viable. The following results summarize the focus group discussions. The results from the two villages in each site did not differ significantly, so the results are presented here by study site rather than by village. We also note distinctions in terms of the preferences between the relatively poorer households and the relatively richer households.<sup>6</sup> (See Table 4.)
  
16. **In the road development study site (Pursat), where the road has increased market access, poorer households are seeking to increase production of a range of agricultural products.** They hope to improve and diversify their livestock rearing activities, expand production of vegetable crops such as water melon, cucumber, long bean, cabbage, morning glory, and also hope to extend rice farming to two times per year. In Ou Ta Prok village, the poorer households also wish to diversify into fish culture, in particular *Pangasius djambal* (trey pra), *Channa striata* (trey ros), and *Clarias batrachus* (trey andeng). The richer households are also seeking to intensify rice farming, vegetable growing and livestock raising, as well as to improve non-farm livelihood activities such as grocery selling and livestock trade.
  
17. **In the irrigation study site (Kampong Thom) the poorer households are seeking to benefit from the anticipated irrigation by intensifying rice farming to two crops per year, and diversifying vegetable production.** Vegetable crops identified by the villagers include morning glory, water melon, cucumber, mung bean, tomato, cabbage, bitter gourd, wax gourd, and mushroom. In the livestock sector, the poorer households are looking to raise

<sup>6</sup> For the focus group discussions, participants were divided into wealth groups based on judgment by the village leader and common agreement among the participants.

more chicken, ducks, pigs and cattle. The richer households too are looking to intensify rice farming, vegetable growing (water melon, cucumber, long bean, black cabbage, chinese cabbage, head cabbage, kinky cabbage and mushroom) and livestock raising (chicken, ducks and pigs). In addition, richer households are seeking to diversify into some non-farm livelihood activities such as motor repairs and grocery selling.

18. **In the fishing lot study site (Battambang), the poorer households are primarily seeking to improve their livelihoods through additional fishing-related activities and fish culture.** For fish culture, they cited in particular *Pangasius djambal* (trey bra), *Channa striata* (trey ros), and *Clarias batrachus* (trey andeng). In addition, they are seeking additional income through working as fishing labour, collecting wood for sale and expanding poultry raising. The richer households want to maintain their existing activities, including fishing, grocery selling, motorized boat taxi, fish and crocodile culture, fish processing and fish trade.

	Road development case (Pursat)	Irrigation case (Kampong Thom)	Fishing lot case (Battambang)
<b>Very poor &amp; poor households</b>	<ul style="list-style-type: none"> <li>• <b>Intensify and diversify livestock raising</b> (cows/oxen, buffalo, chickens, ducks -- and pigs in Ou Ta Prok only)</li> <li>• <b>Intensify fishing activities</b></li> <li>• <b>Intensify rice farming</b></li> <li>• <b>Vegetable growing</b></li> <li>• <b>Fish culture</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Intensify fishing</b></li> <li>• <b>Sugar palm making</b></li> <li>• <b>Vegetable growing</b></li> <li>• <b>Livestock raising</b> (chickens, ducks and pigs)</li> <li>• <b>Intensify rice farming</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Intensify fishing</b></li> <li>• <b>Fish culture</b></li> <li>• <b>Fishing labour</b></li> <li>• <b>Collecting firewood</b> for sale</li> <li>• <b>Livestock raising</b> (chickens, ducks and pigs in the dry season)</li> </ul>
<b>Medium &amp; richer households</b>	<ul style="list-style-type: none"> <li>• <b>Intensify rice farming</b></li> <li>• <b>Vegetable growing</b></li> <li>• <b>Intensify and diversify livestock raising</b> (cows/oxen, buffalo, chickens and ducks)</li> <li>• <b>Improve existing non-farm activities</b> like grocery selling and cow/oxen and buffalo trade</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Intensify fishing</b></li> <li>• <b>Livestock raising</b> (chickens, ducks and pigs)</li> <li>• <b>Vegetable growing</b></li> <li>• <b>Intensify rice farming</b></li> <li>• <b>Intensify and diversify non-farm activities</b> like motor repairs, grocery selling, and trading</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Intensify fishing</b></li> <li>• <b>Intensify and diversify non-farm activities</b> like grocery selling at home, motorized boat taxi, fish trade</li> <li>• <b>Fish and crocodile culture.</b></li> <li>• <b>Fish processing</b></li> </ul>

**Table 4. Livelihood activities that households seek to pursue, distinguished by wealth group**

19. **Notably, in almost all cases, villagers hope to increase their income by intensifying fishing.** The one exception is the richer group in the Pursat case, which did not identify this as a preference. People’s preferences as expressed in the focus groups are closely linked to observations about what activities others in the village or nearby villages are successfully engaged in now. This implies that there remains a very significant gap between what people now say they prefer and what may indeed be viable, i.e. the future mix of livelihood activities that the local ecosystems and/or economies may be able to sustain at higher levels.

#### IV CONSTRAINTS TO LIVELIHOOD DIVERSIFICATION AND LOCAL PERCEPTIONS ABOUT ADDRESSING THESE

20. **The constraints to livelihood diversification identified by villagers are remarkably consistent across the three cases studied. The two most important obstacles are lack of capital / access to credit facilities, and inadequate extension services.** Villagers say that limited financial assets prevents them from diversifying into economically attractive livelihood activities, particularly as alternatives to fishing and collection of wild natural resources. Also very important in their view is the limited knowledge about methods of production and marketing strategies for alternative products, which they seek extension services to address, along with support for inputs such as improved rice seed varieties, fish seed and feed. In the irrigation (Kampong Thom) and fishing lot (Battambang) cases, access to markets ranked as the third major obstacle, while in Pursat it ranked fourth. (This is not surprising as market access was identified as the major benefit of road improvement in the Pursat case.) The remaining obstacles identified were lack of skills and technical knowledge (for example, about livestock raising), poor or inadequate infrastructure, and lack of awareness about the opportunities available for livelihood diversification. (See Table 5.)

Constraints	Road dvpt. case (Pursat)	Irrigation case (Kampong Thom)	Fishing lot case (Battambang)
• Access to credit facilities	1	1	1
• Inadequate extension services and agricultural inputs	2	2	2
• Markets	4	3	3
• Skills and technical knowledge	3	4	4
• Infrastructure	5	5	5
• Lack of awareness/information about alternative livelihood opportunities	6	6	6

**Table 5. Constraints to livelihood diversification, as ranked by village focus groups**

21. **Low-interest microcredit lending was identified – by poorer and richer villagers alike – as the most important way to assist households to overcome the constraints to livelihood diversification.** Because most households do not have appropriate collateral to seek loans from the formal banking system, and because their loan requirements are very small, they typically now rely on informal lending at very high rates of interest.
22. **Other priorities include technical assistance and inputs, information about livelihood alternatives and market opportunities.** In the road development (Pursat) and irrigation (Kampong Thom) cases, technical assistance and training is sought in such areas as sewing, fish culture,



livestock raising, vegetable cultivation, and intensive rice farming. In the case of the floating villages in Battambang, technical assistance and training is sought in such areas as poultry and pig raising, crocodile and fish culture, and sewing, in addition to government support to community fisheries with effective enforcement.

	<b>Road development case (Pursat)</b>	<b>Irrigation case (Kampong Thom)</b>	<b>Fishing lot case (Battambang)</b>
<b>Very poor &amp; poor households</b>	<ul style="list-style-type: none"> <li>• Credit service with low interest rate (1-2% per month)</li> <li>• High yield rice seed, fertilizer and low-lift-pumps</li> <li>• Technical assistance for farming, livestock raising and fish culture</li> </ul>	<ul style="list-style-type: none"> <li>• Credit service with low interest rate (1-2% per month)</li> <li>• High yield rice seed, fertilizer and enough water</li> <li>• Technical assistance for vegetable farming</li> <li>• Marketing channels for palm sugar</li> <li>• Equipment for farming</li> <li>• Assistance from Fisheries Administration to create a community fishery</li> </ul>	<ul style="list-style-type: none"> <li>• Credit service with low interest rate (1-2% per month)</li> <li>• Technical assistance for fish culture</li> </ul>
<b>Medium &amp; richer households</b>	<ul style="list-style-type: none"> <li>• Credit service with low interest rate (1-2% per month)</li> <li>• High yield rice seed, fertilizer and low-lift-pump</li> <li>• Technical assistance for farming, livestock raising and fish culture</li> </ul>	<ul style="list-style-type: none"> <li>• Credit service with low interest rate (1-2% per month)</li> <li>• High yield rice seed, fertilizer and enough water</li> <li>• Technical assistance for vegetable farming</li> <li>• Marketing channels for palm sugar</li> <li>• Assistance from Fisheries Administration to create a community fishery</li> </ul>	<ul style="list-style-type: none"> <li>• Credit service with low interest rate (1-2% per month)</li> <li>• Technical assistance for fish and crocodile culture</li> </ul>

**Table 6. Summary of solutions sought by villagers to address the constraints to livelihood diversification**

## **V CONCLUSION AND RECOMMENDATIONS**

- Promoting rural development that enables new livelihood alternatives or expands the number of participants that can viably take part in existing alternatives is an indirect means of reducing competition and pressure on the natural resource base, fisheries included.** This is especially important in areas where fishing is the leading source of income, as it is currently in the road development (Pursat) and irrigation (Kampong Thom) cases included in this study, or where it is the dominant source of income, as is the case with the floating villages of Battambang.

24. **Efforts at promoting livelihood diversification should include a mix of reducing constraints to enable poorer households to enter into existing alternatives, and cautiously experimenting with newer options.** Outside interventions often focus on new and original, or “boutique” options which may be appealing to project designers but are unproven in the area. Because villagers typically look to activities that are already established in the area (a reasonable way of managing risk for the household), it is likely to be much easier to facilitate livelihood diversification by enabling people to access the livelihood options they are already seeking. Other alternatives will need a longer time to establish as viable. Many will prove inappropriate even if they are technically feasible, for example, because they entail unacceptably high risk or require social organization that may not exist.
25. **Yet, some local expectations about intensifying existing livelihood activities – fishing in particular – are unrealistic.** For communities that have depended overwhelmingly on fishing (such as most floating villages), efforts to regulate fishing and make it more sustainable need to be complemented with support to alternatives such as ecotourism, post-harvest processing, improvements to equity and efficiency in fish trade, and (for those who wish) training for jobs on shore.
26. **Microfinance is in high demand and is perhaps the simplest measure to help families overcome barriers to livelihood diversification.** In terms of the sustainable livelihoods framework, microcredit is a means of increasing household financial assets to permit very modest investments in other livelihood activities. Successful microcredit initiatives require investment in social capital at the same time, to build the patterns of trust among borrowers so that they can monitor and support one another in implementing their business plans and repaying the loans.
27. **In responding to the high demand for technical support services and training, a variety of public-private partnerships should be assessed to provide cost-effective and locally appropriate solutions.** Enabling commune councils select among alternative service providers and allocate local budgets accordingly is one approach. Competitive bidding for service provision contracts at the provincial level is another approach, as has been tried with the health sector in Cambodia. Similarly, the demand for information about livelihood alternatives and about access to markets suggests room for exploring public-private partnerships in incubating business models, for example with aquaculture or small fish processing enterprises.
28. **Complementary investments in basic education and public health are likewise critical for the longer term.** As the analysis in the main technical report demonstrated, many households fail to take advantage of the livelihood opportunities offered by improvements in infrastructure because they lack other essential assets, education in particular. In terms of the sustainable livelihoods framework, investments in education and health are a means of raising human capital assets particularly for poorer households, increasing their chances of moving and staying out of poverty.