INDOCHINA RESEARCH

Project “Time & Distance Study”

CAMBODIA

Final Report

Prepared for: SE Asia Community Access Program

Prepared by: Indochina Research (Cambodia) Ltd

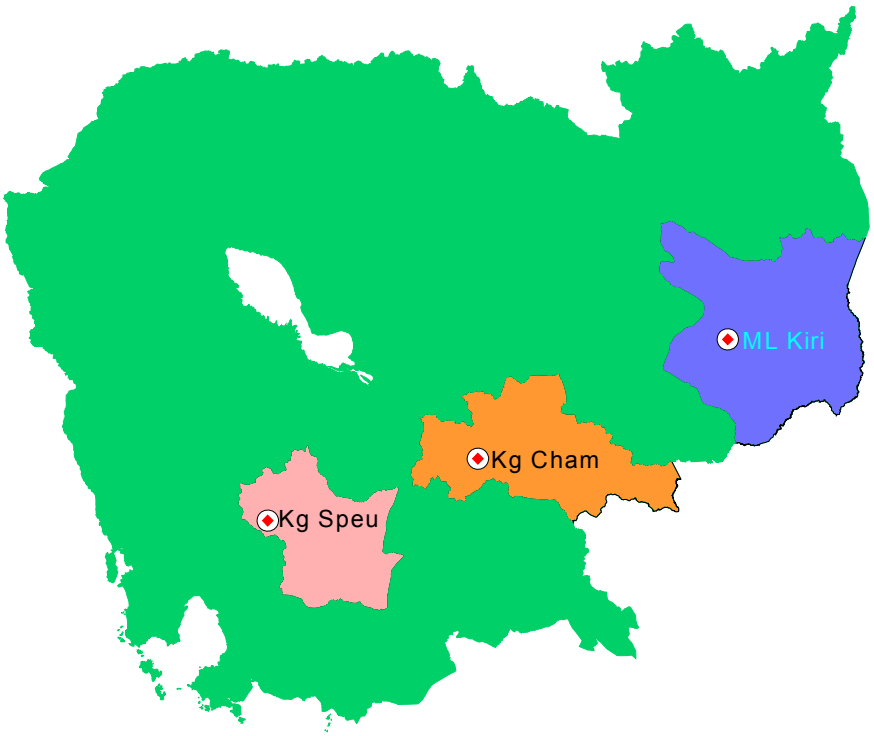
Phnom Penh, Cambodia

December, 2006

INDOCHINA RESEARCH

SE Asia Community Access Program
Time & Distance Study
CAMBODIA

Final Report
December 2006



INDOCHINA RESEARCH

Table of Contents

INDOCHINA RESEARCH

Executive Summary

This survey has been conducted in 3 diverse settings in Cambodia to develop technical guidance for the World Bank & SEACAP in designing surveys which are to include relevant and effective questions on travel time and distance.

The survey sample included 3 provinces, covering the different terrain conditions of Cambodia:

- Kampong Cham - Mostly flat & rural, Centre - East, 1,890K inhabitants
- Kampong Speu - Agricultural hilly terrain, Centre - West, 710K inhabitants
- Mondulkiri - Mountainous, heavily wooded, East, 40K inhabitants

For each province, 2 districts (1 rural, 1 remote) were selected. In each district, 10 villages distributed within a 25km-plus radius were selected. 10 random interviews per villages were conducted.

Thus the sample was 100 per district, Cambodia N = 600.
The survey used face-to-face interviews, based on a structured closed questionnaire. Fieldwork was conducted between July 6th and July 29th 2006. (severe flooding in Mondulkiri forced the choice of districts.)

The results were subjected to a detailed analysis (described in the following pages), and can be thus resumed, referring to SEACAP's ToR original questions (Annex 1)

- ***How reliable are reported distances as proxies of actual distances?***

Perceived walking distances are generally a more reliable indicator than perceived walking time. They don't show consistent over/under estimates, and have a high correlation with GPS distances.

Perceived motorbike distances are more reliable than perceived walking distances, with a very high correlation with actual distances.

In percentage terms, errors in perceived walking distances are highest on the shortest trips (e.g. water) - even if in absolute terms they're small.

- ***How reliable are reported times as proxies of actual times?***

Perceived walking times tend to be overestimated by respondents

Perceived motorbike travel time is overestimated, but to lesser extent than walking.

Both for walking and motorbike, perceived times' correlation with GPS times is good, but not as good as its distances equivalent. Travel time "from home to destination" is more reliable (closer to actual GPS verification times) than travel time stated "from destination to home".

Improved roads, and greater size of the road network improve distance estimates. They improve time estimates as well, but not to the same extent.

- ***How can travel times be explained by travel distances?***

Respondents Perceived Walking time…

Perceived walking times are well correlated with perceived walking distances – except for the closest (water) and farthest (market) destinations.

- Perceived walking times are well correlated with actual GPS distance measurements, with moderate correlation levels for both water and market.
- On the whole, perceived times can be a good predictor of distances - but possibly not in all cases. A wider range of cases should be examined.

Perceived Motorbike Travel Times

- Perceived motorbike times and motorbike distances are highly correlated, though not as highly as motorbike distances.
- Motorbike times are more reliable, albeit slight overestimated, predictors of travel times.
- Motorbike distances explain motorbike times better than in the case of walking.
- Motorbike times can be used only for middle- and long-distance destinations.

- ***What is the impact of personal characteristics on reported and actual travel times?***

- In the majority of cases, destination frequencies are distributed by ascending distance thus: water, rice fields, administrative office, school, health centre, Wat, market.
- Distance estimates for Rice Fields & Administrative offices are similar, as are School and Health Centre. However, their actual distance does not seem correlated to accuracy of estimates.
- Among all destinations, Wats have the best time & distance correlations of respondent estimates and GPS verification both for distance and time; correlations for water sources were the lowest.
- This finding may be subject to some constant "external influences" – such as the ritual of going to the Wat leads to a more acute consciousness of time and distance, going to water source means coming back carrying it (and thus is perceived as longer), etc.
- The data show that in most cases men tend to overestimate distance more than women; this is independent of destination.
- People over 25 tend to give better estimates of distances (and possibly of times). Education levels may be correlated to better estimates of distances.
- However, the above hypotheses about gender, age and education need to be tested more extensively and with more specific research tools.

- ***Which measure, time or distance, is recommended as probably more reliable and relevant under particular circumstances – and why?***

- Distances should be preferred - they are better correlated with actual GPS data. Times however show themselves fairly reliable too.
- People seem more familiar with measures of distance than measures of time.
- Moreover, perceived time to any destination is subject to many factors (e.g. encounters, chats, weights carried etc), which cannot be adequately measured.

- ***How should time and/or distance questions be best phrased in each survey country?***

Distances – measures of distance should be asked using a person's units, translating them in kms if needed. The best indicator of actual distance is the distance associated with their most common mode of transport.

Time - should be asked in general terms, possibly using natural indicators (sun, etc). Asking time from destination to home is superfluous.

Locations - Seven destinations are too many, and too subjects to local vagaries: it would be better to identify in each village, from a fixed list of destinations, the closest, the farthest and the middle one, measure their distances & times, then limit the interview to those three. That would also allow more cogent comparisons.

Interviewees should be screened in order to gauge their familiarity with time/distance measurements. Two questionnaires should be used - the standard one, and a very simplified version.

IRL's recommendations are as follows:

Re-examining the study, one comes to very similar conclusions to those of an identical study in Laos:

- The sample sizes per province, and the number of provinces chosen, were too small.
- Combined with the quantity of segmentations offered (mode of transport and destination, optionally frequency of trips, etc), this created too many subsegments that, given the sample size, could hardly have been significant.

Thus, recommendations for future Time & Distance studies would be:

- Sample - A larger sample size per province, so to guarantee that the theoretical sub-samples are large enough to allow for meaningful analysis
- Locations - Instead of 3 diversified provinces, it would be better to choose pairs of provinces with similar socio-economic and infrastructural characteristics, and conduct comparative studies. That would also allow a more homogeneous sample, yielding statistically sounder results.
- Questionnaire - should be simplified along the lines described previously and a section could be introduced, probing the interviewees' perceptions of distance, both with practical examples (and tests), and in the abstract.
- Timing / Frequency - The study could be planned along the lines of a baseline survey, designed to be repeated at fixed intervals.

Introduction:

Objectives, Methodology, General Sample Characteristics

SEACAP aims at improving the quality of statistical data for travel indicators and at developing a technical guidance note on the relative and absolute reliability and accuracy of time and distance reports.

The present survey has been conducted in 3 diverse settings in Cambodia to develop technical guidance for the World Bank & SEACAP in designing surveys which are to include relevant and effective questions on travel time and distance. Together with a parallel survey in Laos, this survey addresses the distance estimates made by respondents in terms of:

- How reliable are reported distances as proxies of actual distances?
- How reliable are reported times as proxies of actual times?
- How can travel times be explained by travel distances?
- What is the impact of personal characteristics on reported & actual travel times?
- Which measure, time or distance, is recommended as probably more reliable and relevant under particular circumstances – and why?
- How should time and/or distance questions be best phrased in each survey?

The survey sample was constructed by a four-stage process:

- 3 provinces were selected, covering the different terrain conditions of Cambodia:
  - Kampong Cham - Mostly flat & rural, Centre - East, 1890K inhabitants
  - Kampong Speu - Agricultural hilly terrain, Centre - West, 710K inhabitants
  - Mondulkiri - Mountainous, heavily wooded, East, 40K inhabitants
- For each province, 2 districts were selected:
  - 1 containing the provincial capital or close to it;
  - 1 more distant district (rural or remote).
- For each district, 10 villages were selected, in concentric circles:
  - 2 at 0-5 km from the district centre; 2 at 5-10; 2 at 10-15; 2 at 15-20; 2 at more than 25 km.
- For each village, 10 households were randomly selected. 1 respondent per household was finally randomly selected, with the following stratifications (proportional to population):
  - Gender
  - Age groups: 13-18, 19-24, 25-34, 35-44, 45+.

Thus the sample was 100 per district, Cambodia N = 600.

The survey used face-to-face interviews, based on a structured closed questionnaire. Fieldwork was conducted between July 6th and July 29th 2006 (severe flooding in Mondulkiri forced the choice of districts.)

Kampong Cham

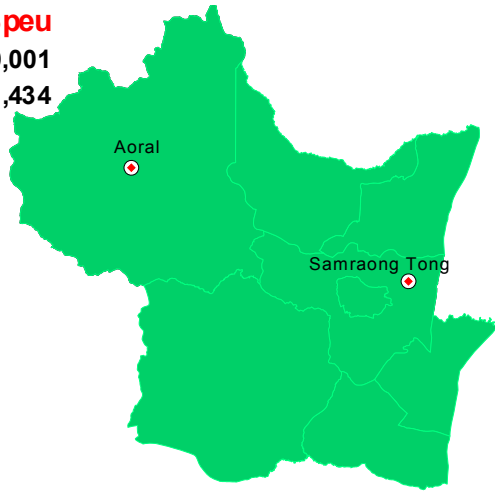
Kampong Siem - N=100 - inh. 116,545

Memot - N=100 - inh. 130,946

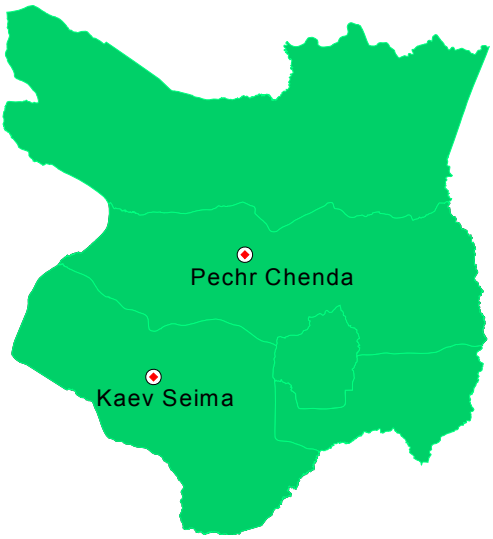
Kampong Speu

Samraong Tong - N=100 - inh. 139,001

Aoral - N=100 - inh. 18,434



For all three provinces, the first district is close to the capital, and rural (i.e., accessible by road). In Kg Cham and Mondulkiri, the second district too is accessible by road.



Mondulkiri

Pech Chenda - N=100 - inh. 6,035

Kaev Seima - N=100 - inh. 8,584

General Characteristics

Gender	
Male	49%
Female	51%

Age group	
13 to 18	20%
19 to 24	20%
25 to 34	20%
35 to 44	21%
45 and over	19%

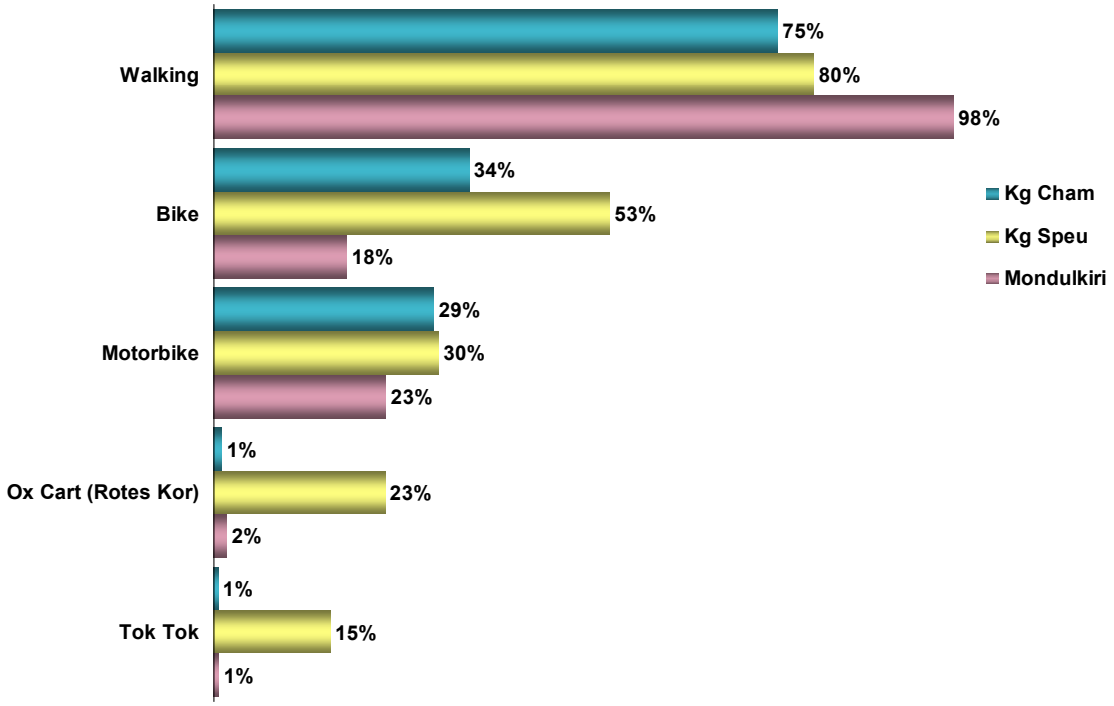
Province by type of district	
Kampong Cham rural	100%
Kampong Cham remote	0%
Kampong Speu rural	52%
Kampong Speu remote	48%
Mondulkiri rural	100%
Mondulkiri remote	0%

Education	
Some primary school	49%
Completed primary school	6%
Some secondary school	15%
Completed secondary school	2%
No formal schooling	28%

The sample is equidistributed by gender, and by age groups (40% are under 25). Education levels are quite low: nearly 4 out of 5 have not completed primary school, and more than a quarter have never been to school (vs 2% of completed secondary).

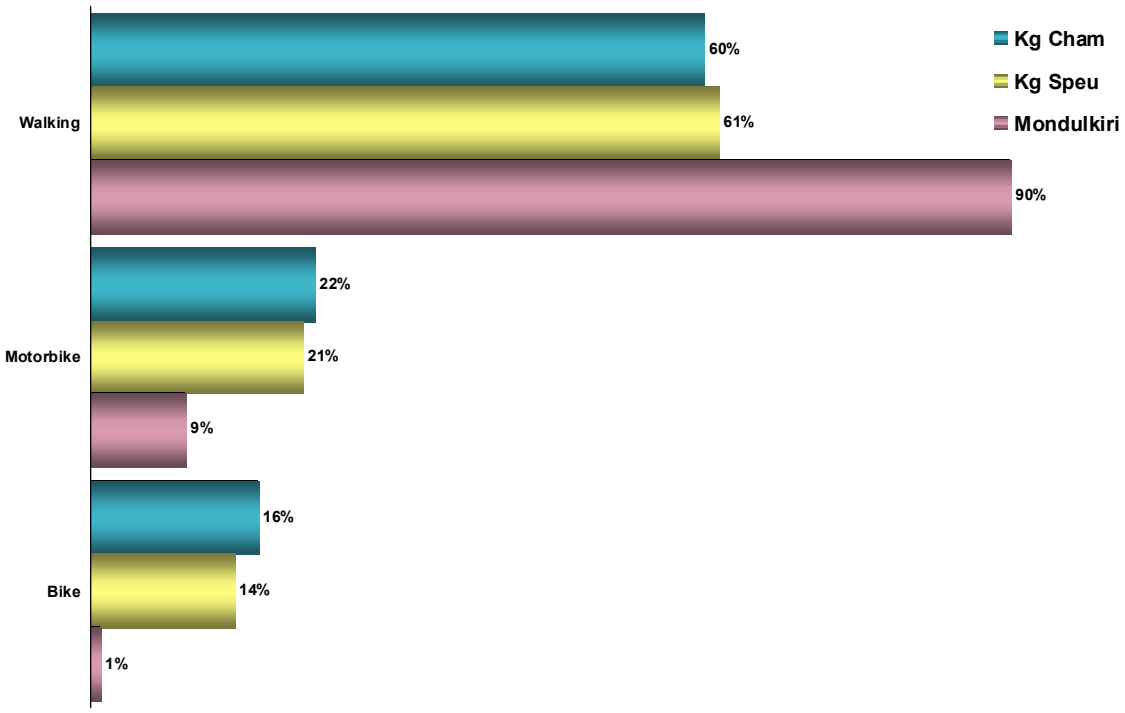
It is relevant to data interpretation that all Kg Cham and Mondulkiri areas are reachable by road, whereas in Kg Speu half the interviewees live in areas with a very limited road system.

Overall modes of transport
By province



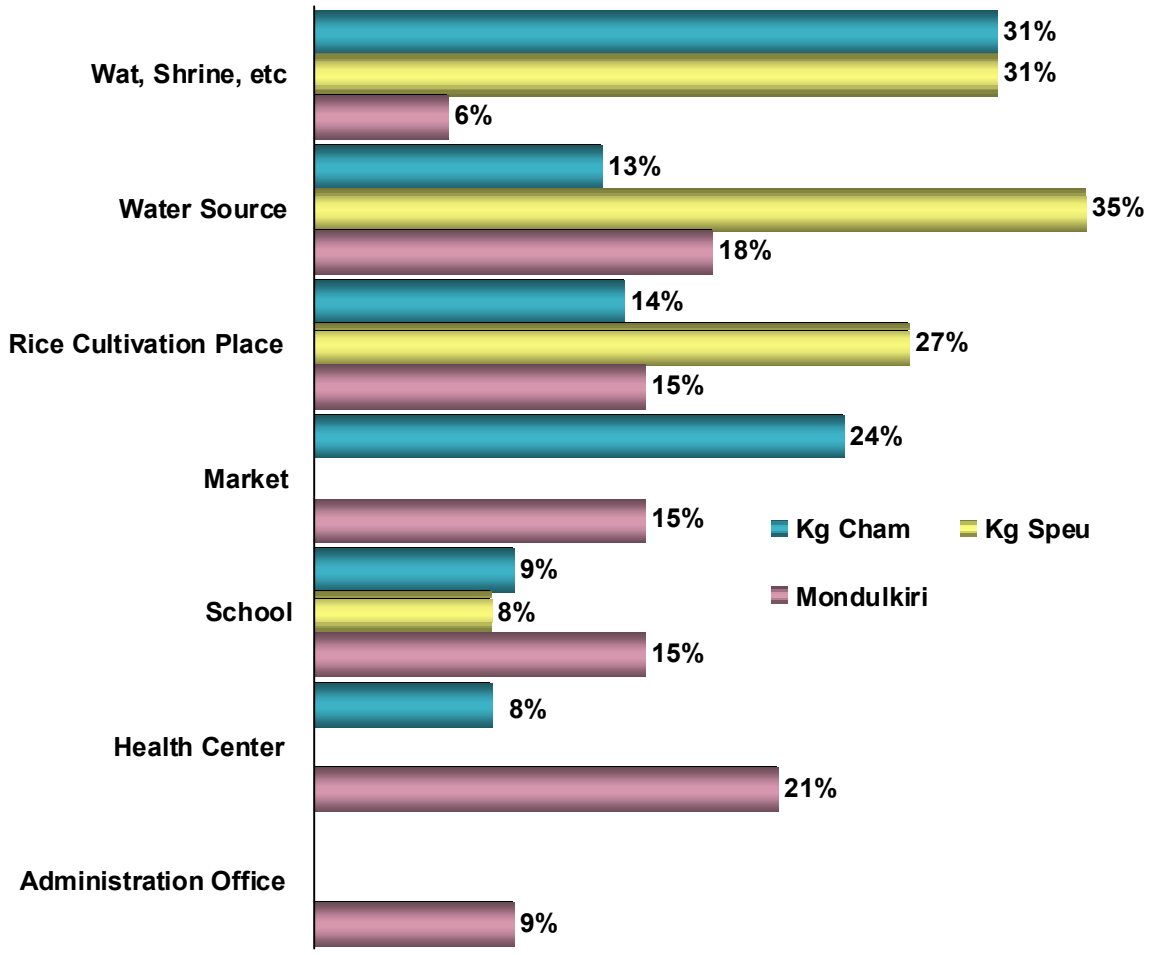
- Walking is the predominant mode of transport (overwhelmingly so in Mondulkiri). It is followed by bikes and motorbikes.
- Kg Speu offers the biggest variety - ox carts and tok tok have disappeared in Kg Cham, and Mondulkiri.

Most used mode of transport
By province



- When it comes to selecting the mode most used to a given destination, the gap between walking and other modes consolidates.
- In Mondulkiri, 9 people out of 10 mostly walk. In the two richer provinces, it's 6 out of 10. Motorbikes (20%) and bikes (15%) make up the rest.

Time From home ≠ Time To home: significant cases (% of total interviews)
By province



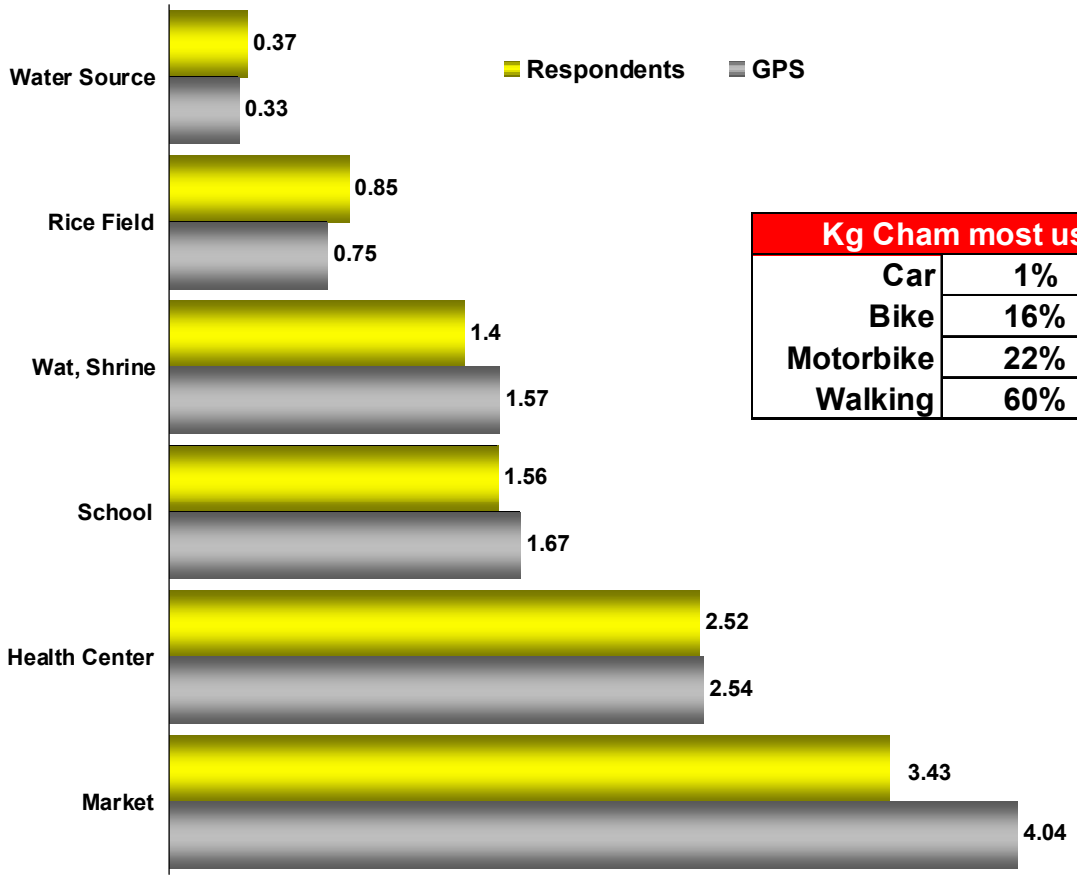
- Since the questionnaire asked both times from home to each of the destinations, and times from destinations to home, we examined the differences in results.
- All significant cases of difference concern walking, and are spread across destinations; the most frequent differences are with Wats and water sources (carrying loads respectively to and from?)
- In only 3 instances out of 21, however, times from a destination differ from times to the same destination by more than 30%.
- Admin offices have been visited only by 9 people in Kg Cham and 8 in Kg Speu (and 68 in Mondulkiri); they won't be used in the analysis.

Part II - *Kampong Cham*

Kg Cham - distances

Mean (all modes) distances FROM home TO…

Respondents vs GPS (kms)



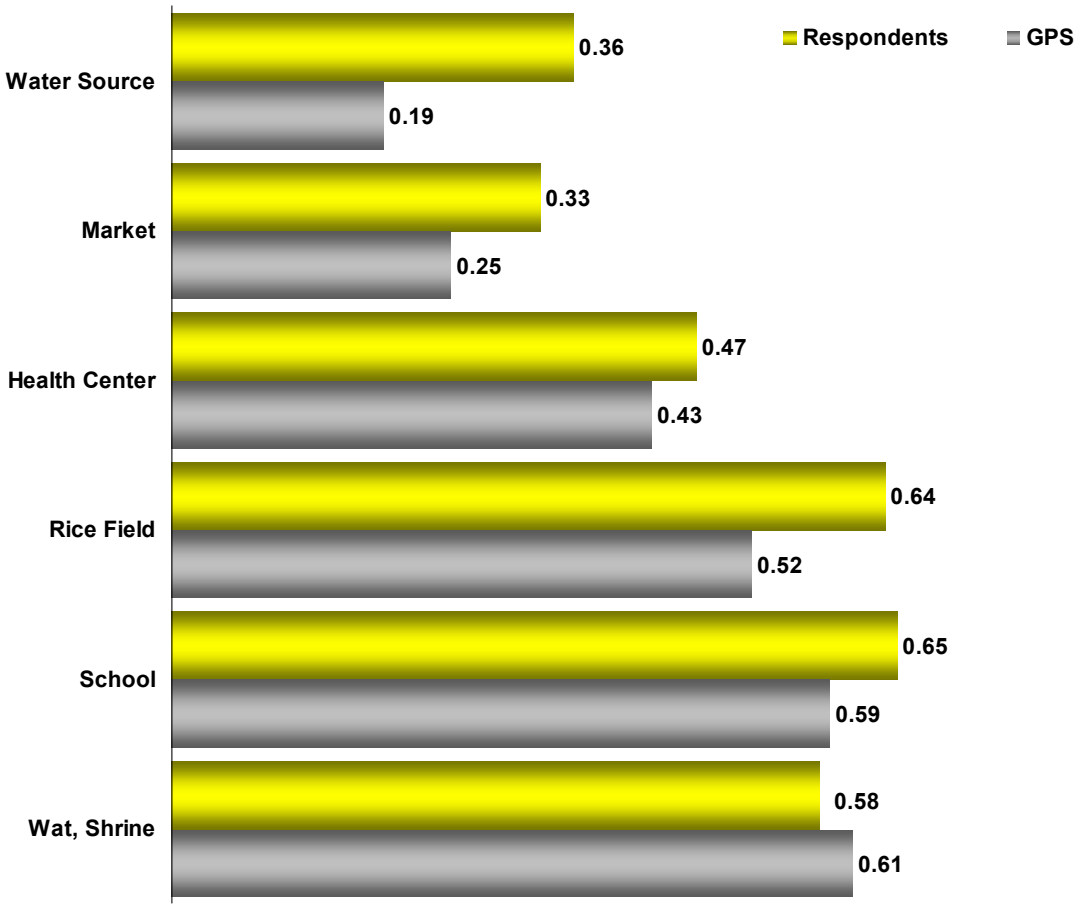
Kg Cham most used	
Car	1%
Bike	16%
Motorbike	22%
Walking	60%

- There is a good fit between respondents' evaluation of distances and GPS-measured ones.
- Water and rice paddies are on average the closest destinations; health centres and schools are more distant, and markets are the farthest - but on average only: when people walk to market, it's quite close.
- Mean distances aggregate walking and motorbike - thus very close and comparatively far instances of the same destination are bundled together (as in the case of markets).

Kg Cham - distances

Walking (60%) FROM home TO…

Respondents vs GPS (kms)

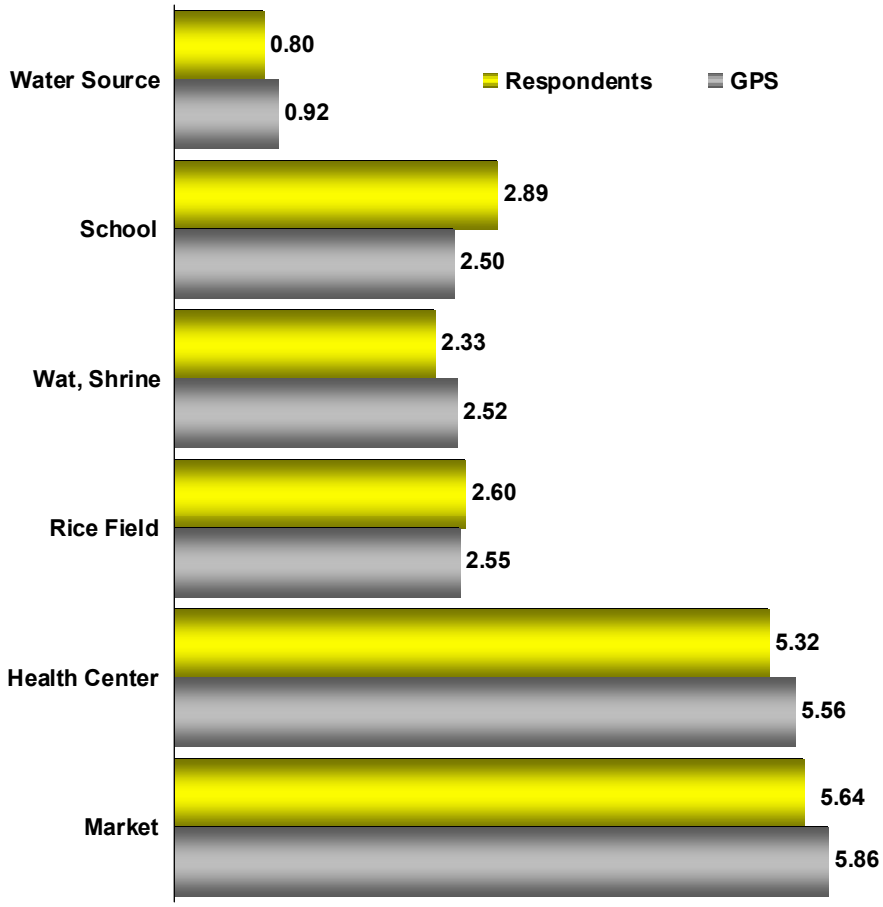


- This chart shows how the territory is perceived by most inhabitants. Distances are averages.
- Distances are all under 600m; thus errors, which are quantitatively low (170m at most), look deceptively high as percentages.
- On the whole, walking distances are overestimated - but it's easier to err by excess on short distances.
- The largest % differences between respondents and GPS concern water (respondents' estimate is GPS +89%) and rice field (GPS +23%): they are the two most frequent destinations. And conditions of going and coming back are different.

Kg Cham - distances

Motorbike (22%) FROM home TO…

Respondents vs GPS (kms)



- This chart applies to those who have largest distances to cover, and use a motorbike.
- The figures for water sources, rice paddies and school refer to 5 cases each and can be ignored.
- Other figures are more reliable (they are all slightly underestimated), and confirm that people recur to motorbikes only when the return distance 5 kms or more.
- There is on the whole a very good fit between respondents' estimates and GPS.

Correlation

Correlation Matrix
- Explanation & Results Guide -

Correlation variables measure the relationship between different factors. Correlation can be thought of as representing the **extent to which a change in one particular factor will have an impact upon another factor, or group of factors**. Correlation influences are summarized as follows:

Equal Size & Equal Direction - this means that if one variable changes then a related variable will change in exactly the same way (e.g. if one variable increases by 1% then the related factor will also increase by 1%). This is said to be a "direct positive correlation".

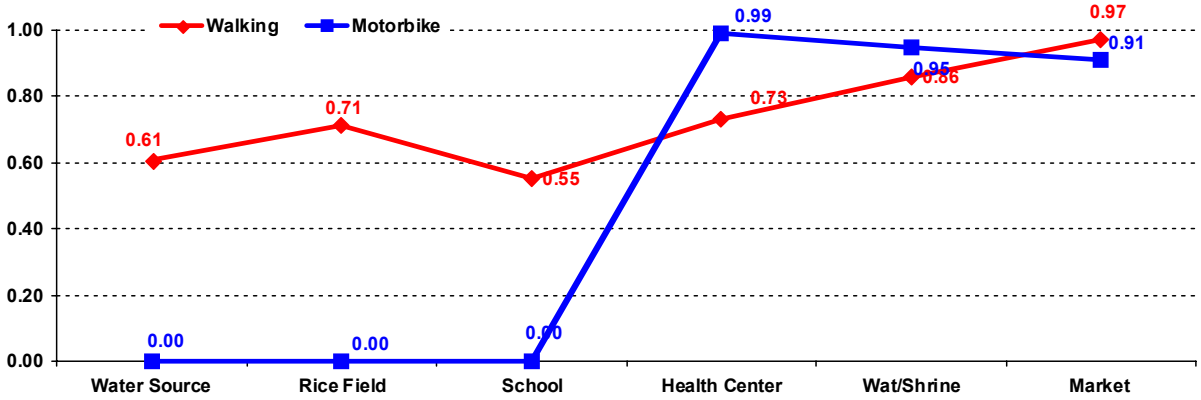
Equal Size & Opposite Direction - this means that if one variable changes then a related variable will change in the inverse / opposite manner (e.g. if one variable increases by 1% then the related factor will decrease by 1%). This is said to be a "direct inverse correlation".

Proportional Size & Direction - this means that if one variable changes then a related variable will also change but not in exactly the same manner. In other words the related variable may increase or decrease by an amount that is some proportion of the change in the original factor. (e.g.. If one variable increases by 1% then the related factor may increase by 0.37% or decrease by 0.18% depending upon what the relationship or correlation is between the two factors. This is said to be a "proportional correlation"…..this relationship is shown in the following tables...

Kg Cham - distances

Correlation FROM home To…

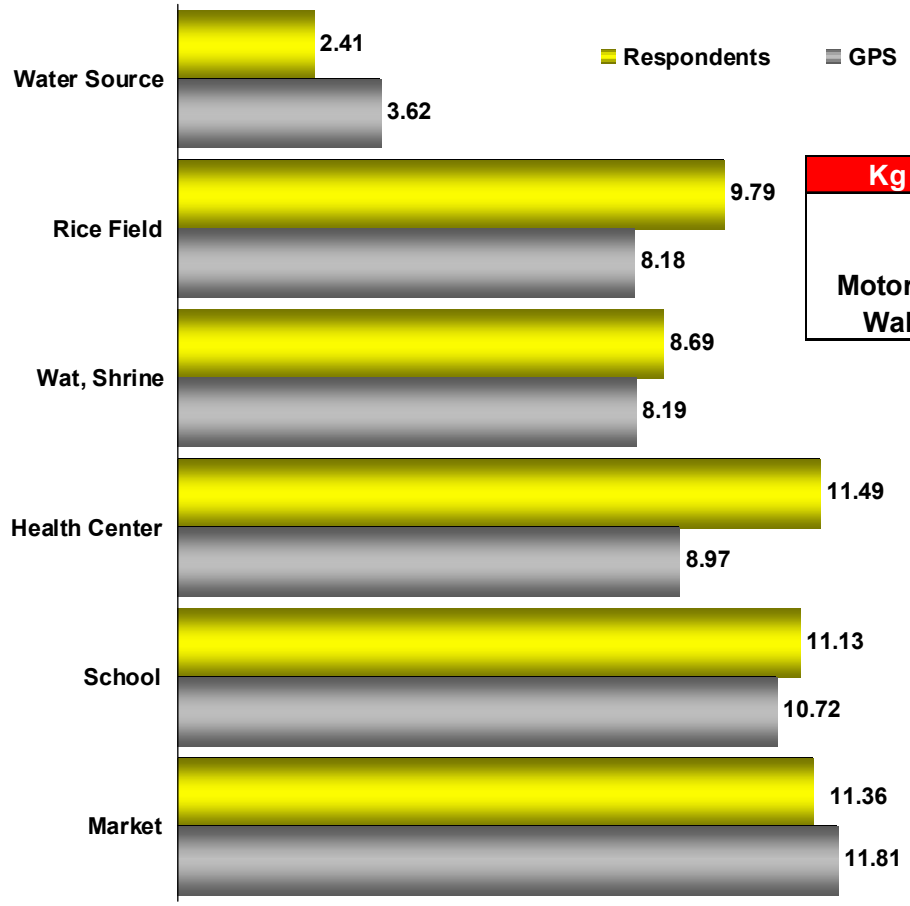
Respondents vs GPS



Correlation Size	Strength of Relationship
0.8 to 1.0	Very high +ve correlation
0.6 to 0.8	High +ve correlation
0.4 to 0.6	Moderate +ve correlation
0.2 to 0.4	Low +ve correlation
0.2 to -0.2	No real correlation
-0.2 to -0.4	Low -ve correlation
-0.4 to -0.6	Moderate -ve correlation
-0.6 to -0.8	High -ve correlation
-0.8 to -1.0	Very High -ve correlation

- The two correlation graphs are quite close: it means that Kg Cham interviewees have on the whole a good perception of distances (absolute differences with GPS distances are also quite small), independently from the transport they use.
- Walking. There is a high or very high correlation between respondents' and GPS walking distances to all destinations but school (in other words, the value of respondents' distances increases in close proportion to the increase of real distances). It is obviously not dependent on distance (on foot, schools, wats and HCs are comparatively far - 600m at most).
- Motorbike. Even ignoring school, water and rice, correlations are extremely high. Estimated motorbike distances are here a good indicator of actual distance.

Kg Cham - time From
Mean times (all modes) FROM home TO…
Respondents vs GPS (mins)



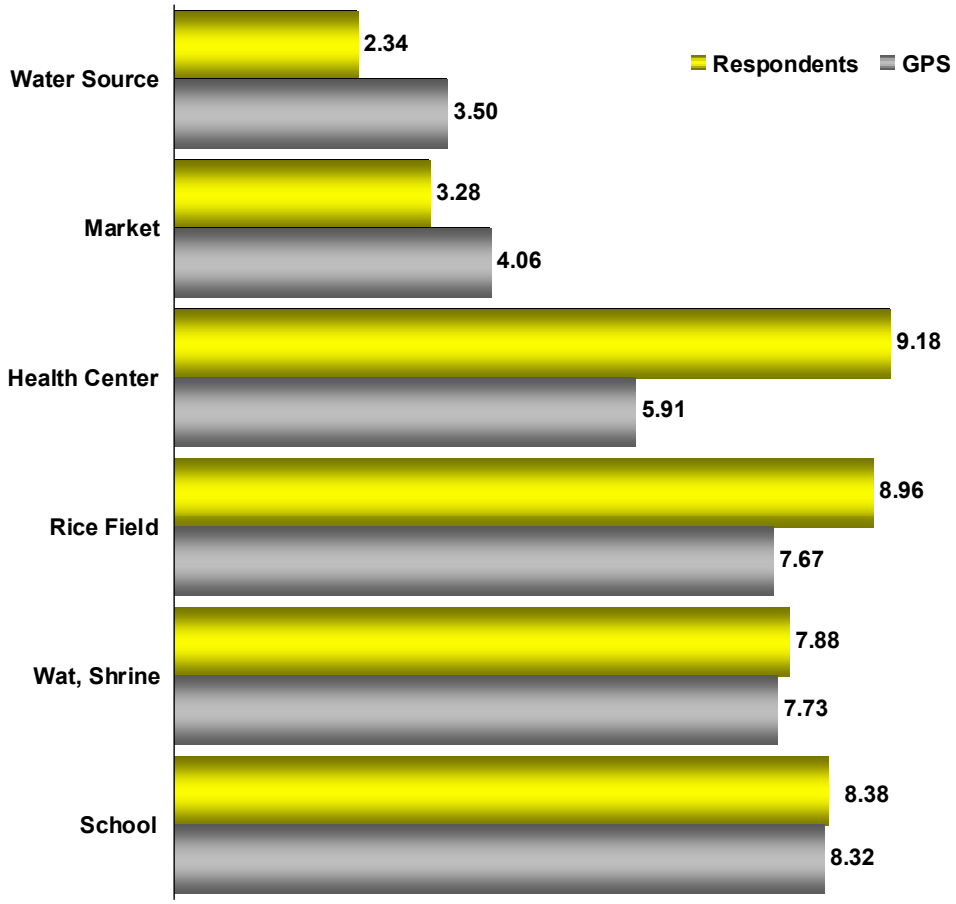
Kg Cham most used	
Car	1%
Bike	16%
Motorbike	22%
Walking	60%

- The mean times from home to destination fit overall the distribution of mean distances to destination.
- Respondents tend to overestimate the times.
- On the whole, Kg Cham interviewees seem fairly close to all destinations - between 4 and 12 minutes.
- The best mean correspondence between respondents and GPS is with markets.

Kg Cham - Time

Walking (60%) FROM home TO…

Respondents vs GPS (mins)

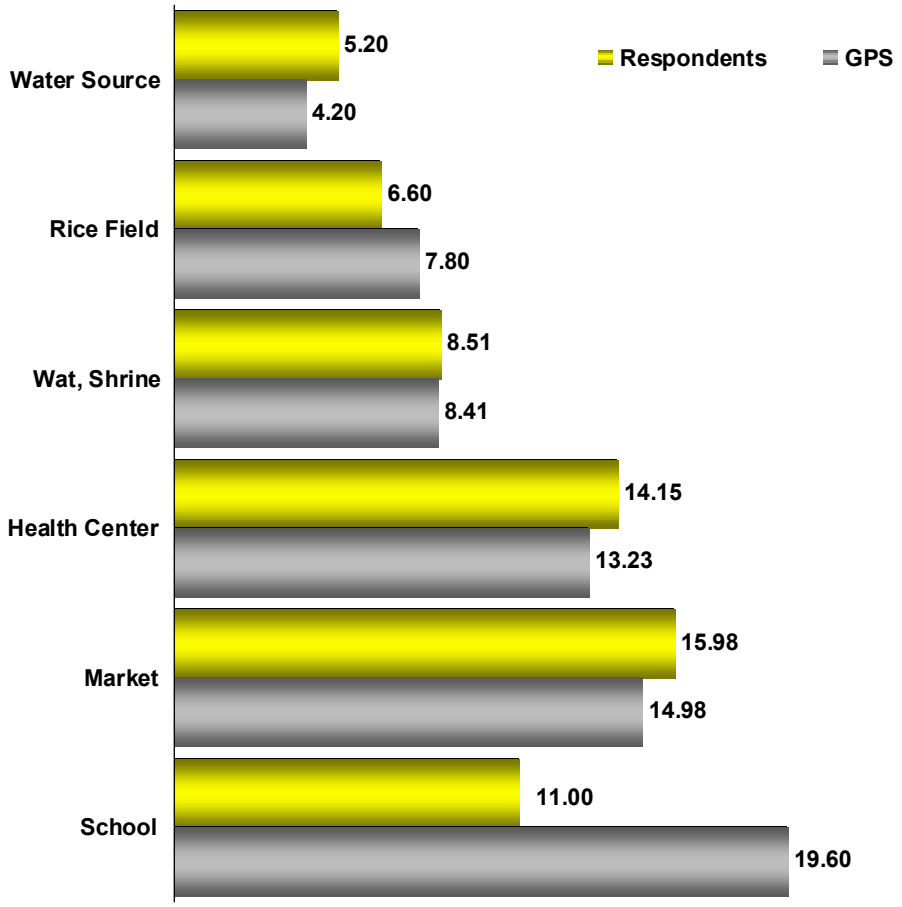


- Walking average times show on the whole a good fit with GPS measurements- but not as good as distances.
- Most walking times are overestimated - the exception being the shortest distances, water and markets.
- Inaccuracy seems tendentially to decrease with distance.

Kg Cham - Time

Motorbike (22%) FROM home TO…

Respondents vs GPS (mins)

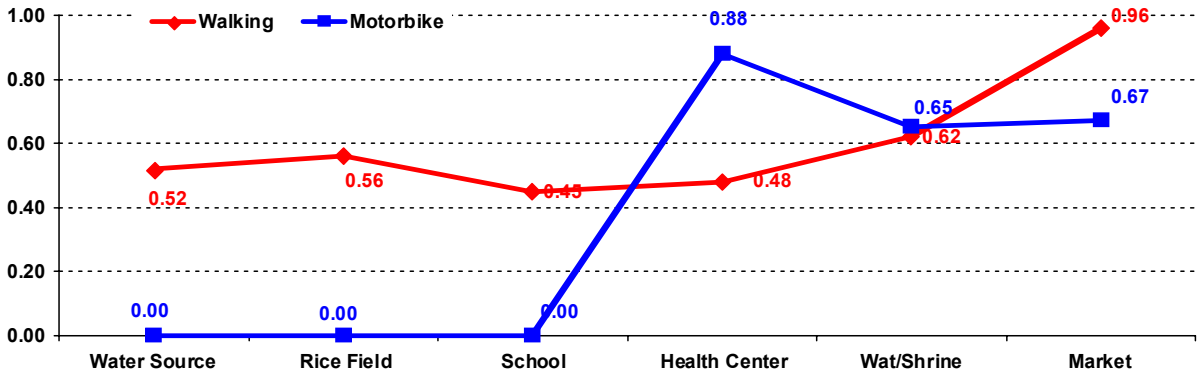


- Absolute times of course increase, since a motorbike is needed for greater distances. School, water and rice should be ignored (5 cases each).
- In the reliable cases, respondents still tend to overestimate travel times, but less than when walking (not at all, in the case of Wats).

Kg Cham - Time

Correlation FROM home To…

Respondents vs GPS



Correlation Size	Strength of Relationship
0.8 to 1.0	Very high +ve correlation
0.6 to 0.8	High +ve correlation
0.4 to 0.6	Moderate +ve correlation
0.2 to 0.4	Low +ve correlation
0.2 to -0.2	No real correlation
-0.2 to -0.4	Low -ve correlation
-0.4 to -0.6	Moderate -ve correlation
-0.6 to -0.8	High -ve correlation
-0.8 to -1.0	Very High -ve correlation

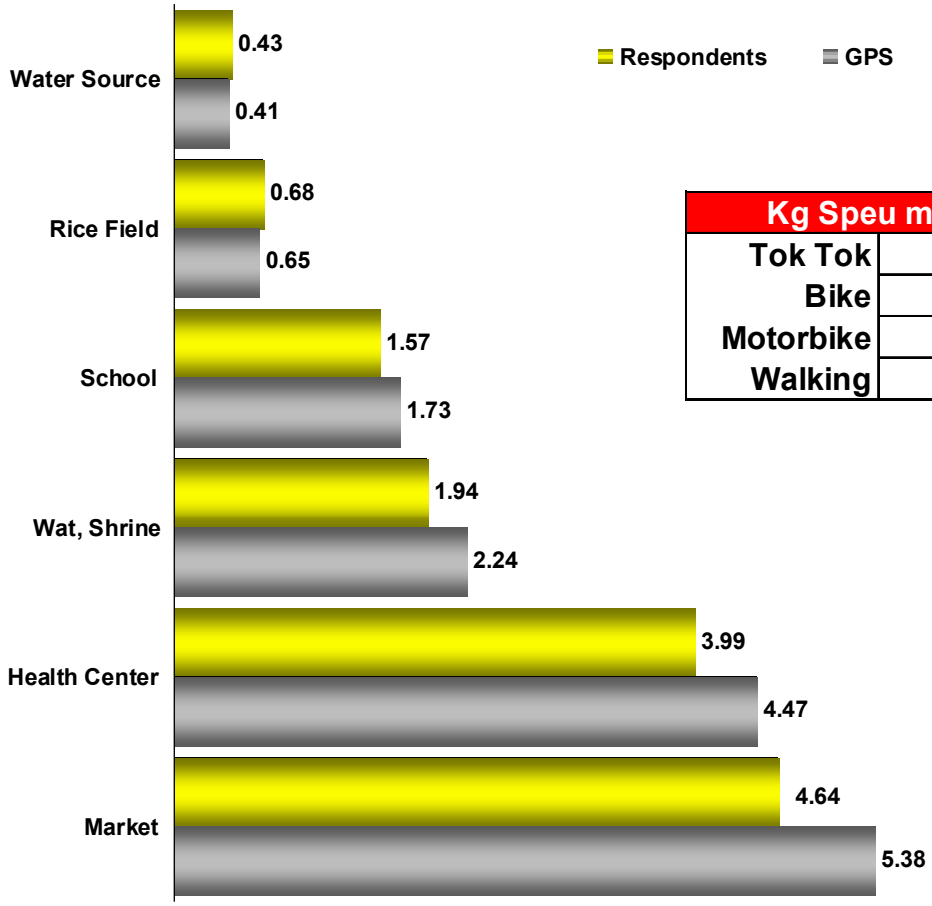
- The two correlation lines are fairly close, and moderate or high: Kg Cham respondents have a good appreciation of time, with a tendency to overestimate. Motorbike times, when in sufficient numbers, are on average slightly more reliable.
- Walking. High or very high correlation between respondents' and GPS walking times to wats and markets. There is a moderate correlation for all other destinations. Walking times' correlations to GPS are lower than walking distances' correlations.
- Motorbike. School, water and rice paddies are ignored. High or very high correlations for wat, market and Health Center (and absolute errors were low).

Part III - Kampong Speu

Kg Speu - distances

Mean distances FROM home TO…

Respondents vs GPS (kms)



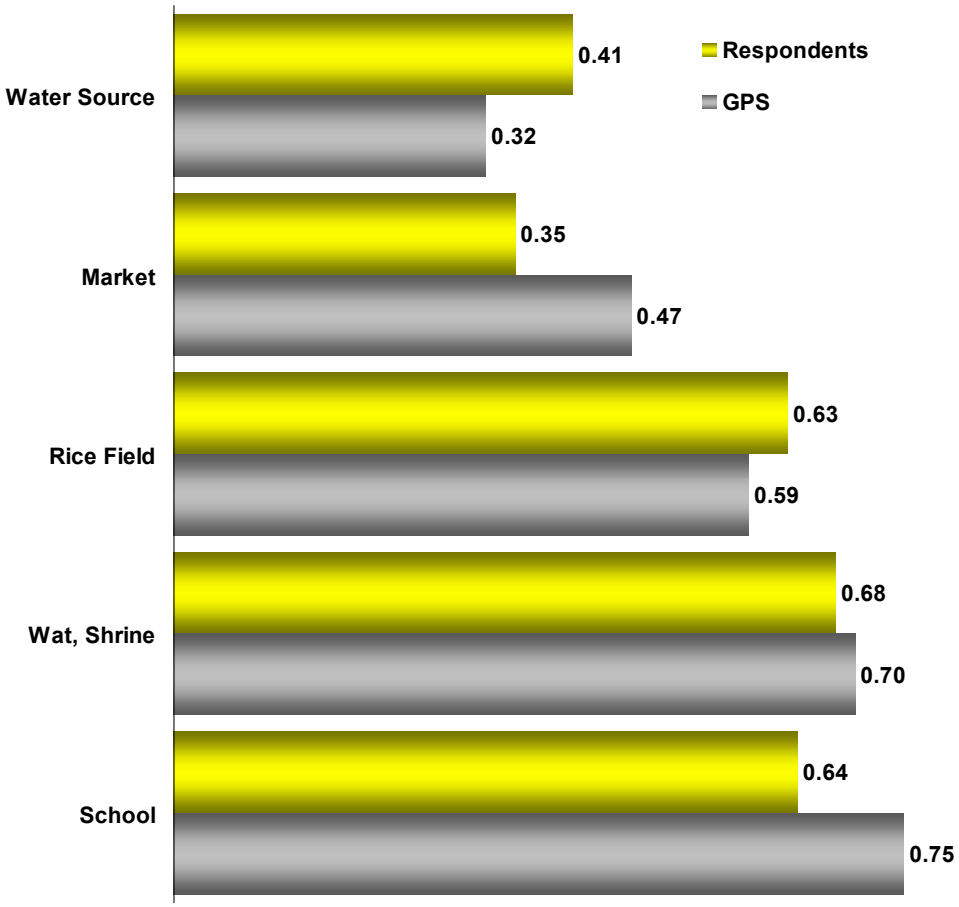
Kg Speu most used	
Tok Tok	3%
Bike	14%
Motorbike	21%
Walking	61%

- The distribution of average distances has water and rice fields very close, then schools and wats, then health centres and markets. (Only 8 people go to administration offices.)
- Compared to Kg Cham, health centres, schools and markets are more distant, because in Kg Speu one district is rural, and the other is remote.
- Again, mean distances aggregate walking, motorbike and other modes: the overall distance profile is however similar to the previous one.

Kg Speu - distances

Walking (61%) FROM home TO…

Respondents vs GPS (kms)

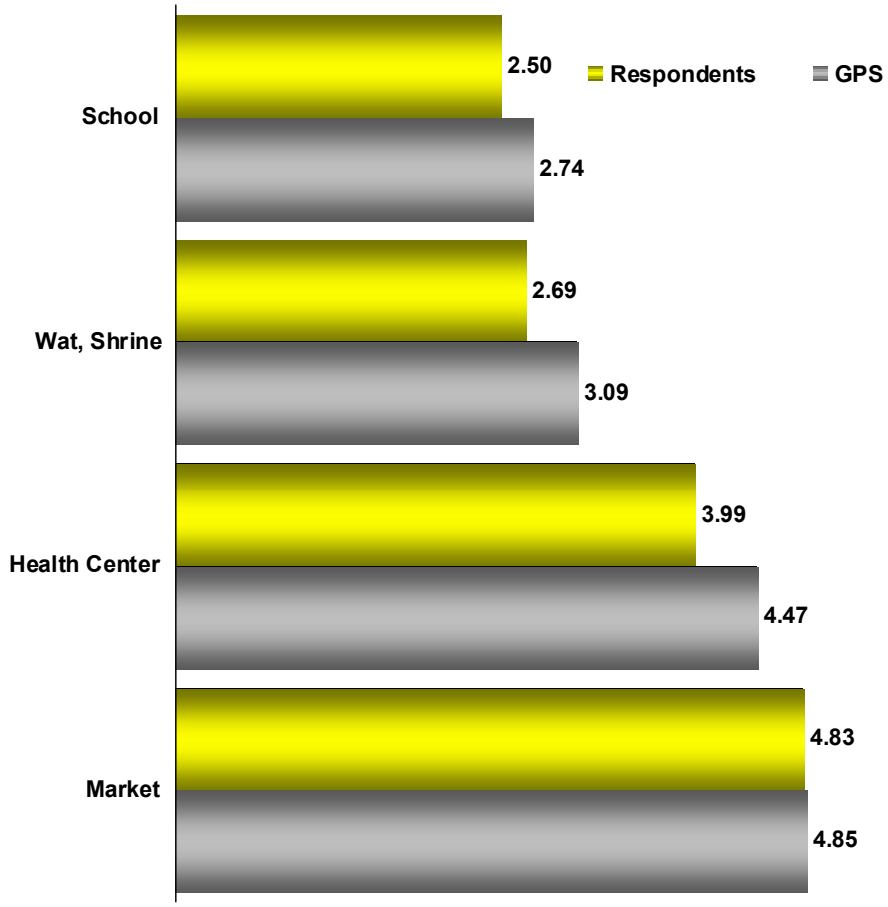


- Walking distances vary on average between 300 and 750 metres. (Health centres are too far to walk.)
- For those who walk to them, water sources and markets are the closest destinations.
- The largest percentage errors are, again, for the shortest distances (water +28% of GPS distance; market -25%). In absolute terms they are quite small.
- On the whole there is a good fit between respondents' estimates and actual distances - keeping in mind that the shorter the distance the greater a small error becomes in percentage terms.

Kg Speu - distances

Motorbike (21%) FROM home TO…

Respondents vs GPS (kms)

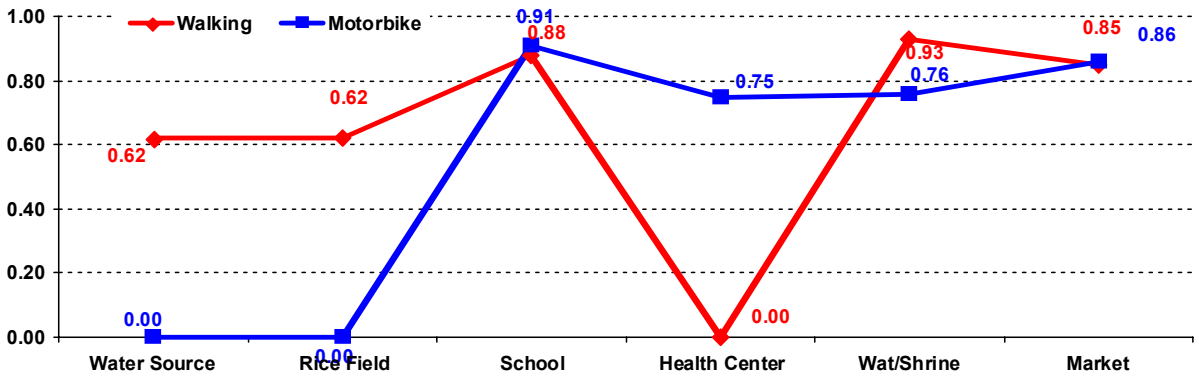


- The figures for most destinations are fairly similar. (Nobody goes to water or to rice by motorbike - it's close enough to walk.)
- Average distances vary between 3 and 5 kms.
- In Kg Speu too there is a good fit between respondents and GPS, with a tendency to underestimate distances. The biggest error margins are Wat (-13% of GPS) and health centre (-11% of GPS).

Kg Speu - distances

Correlation FROM home To…

Respondents vs GPS



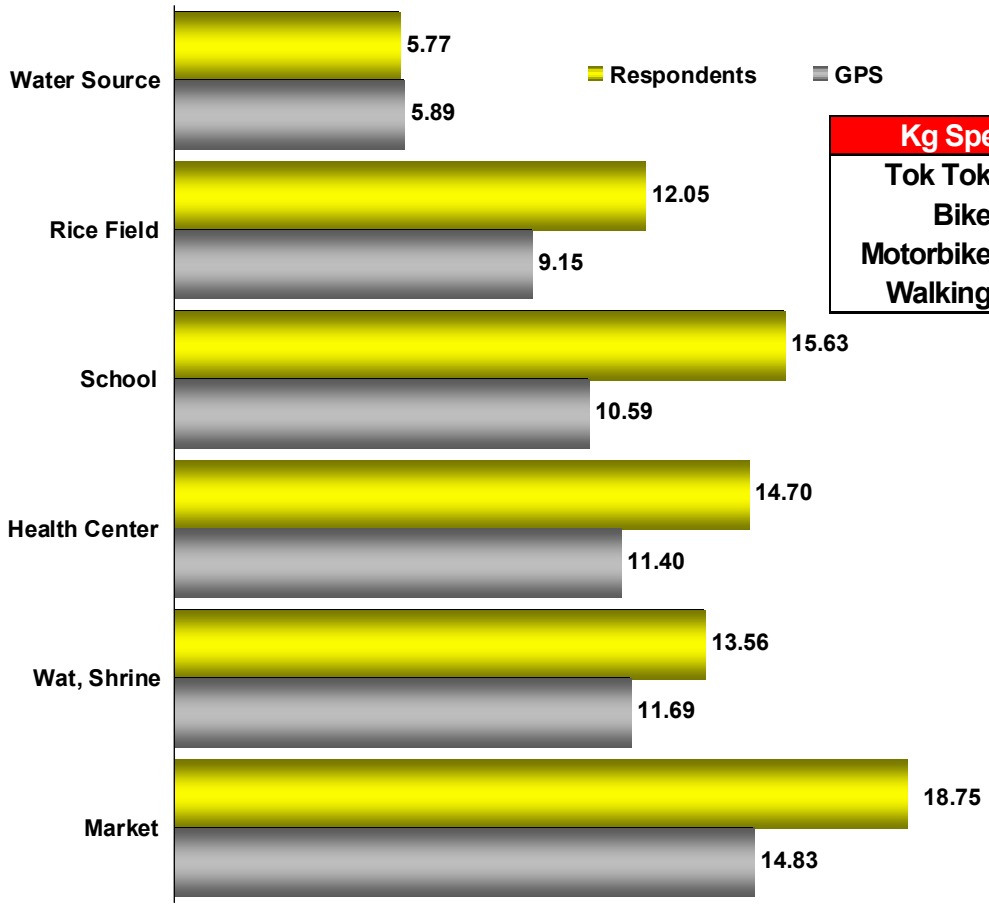
Correlation Size	Strength of Relationship
0.8 to 1.0	Very high +ve correlation
0.6 to 0.8	High +ve correlation
0.4 to 0.6	Moderate +ve correlation
0.2 to 0.4	Low +ve correlation
0.2 to -0.2	No real correlation
-0.2 to -0.4	Low -ve correlation
-0.4 to -0.6	Moderate -ve correlation
-0.6 to -0.8	High -ve correlation
-0.8 to -1.0	Very High -ve correlation

- If we ignore the cases with very few or no respondents, correlations between perceived distances and GPS distances are quite good, although not as good as in Kg Cham.
- Walking. There is a high or very high correlation between respondents' and GPS walking distances for every destination they actually go to. It is not dependent on distance.
- Motorbike. Very high correlations for school, health centre, wat, market. Again, independent from distances.

Kg Speu - time From

Mean times FROM home TO…

Respondents vs GPS (mins)



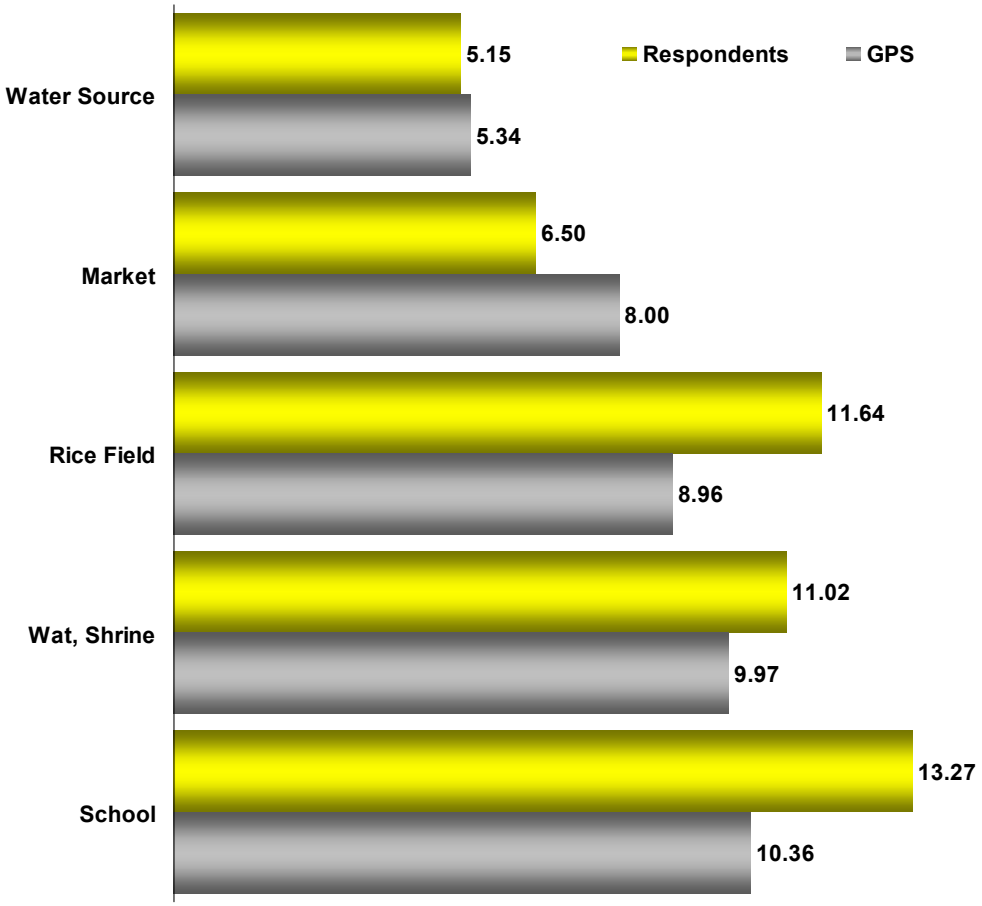
Kg Speu most used	
Tok Tok	3%
Bike	14%
Motorbike	21%
Walking	61%

- Here again, mean times from home to destination fit overall the distribution of mean distances to destination (taking into account that nobody goes to water by motorbike).
- Again, respondents regularly overestimate trip times.
- Reflecting the composite nature of the terrain of the two districts, in Kg Speu there is a gradual increase of times, which are all greater than in Kg Cham.

Kg Speu - Time

Walking (61%) FROM home TO…

Respondents vs GPS (mins)

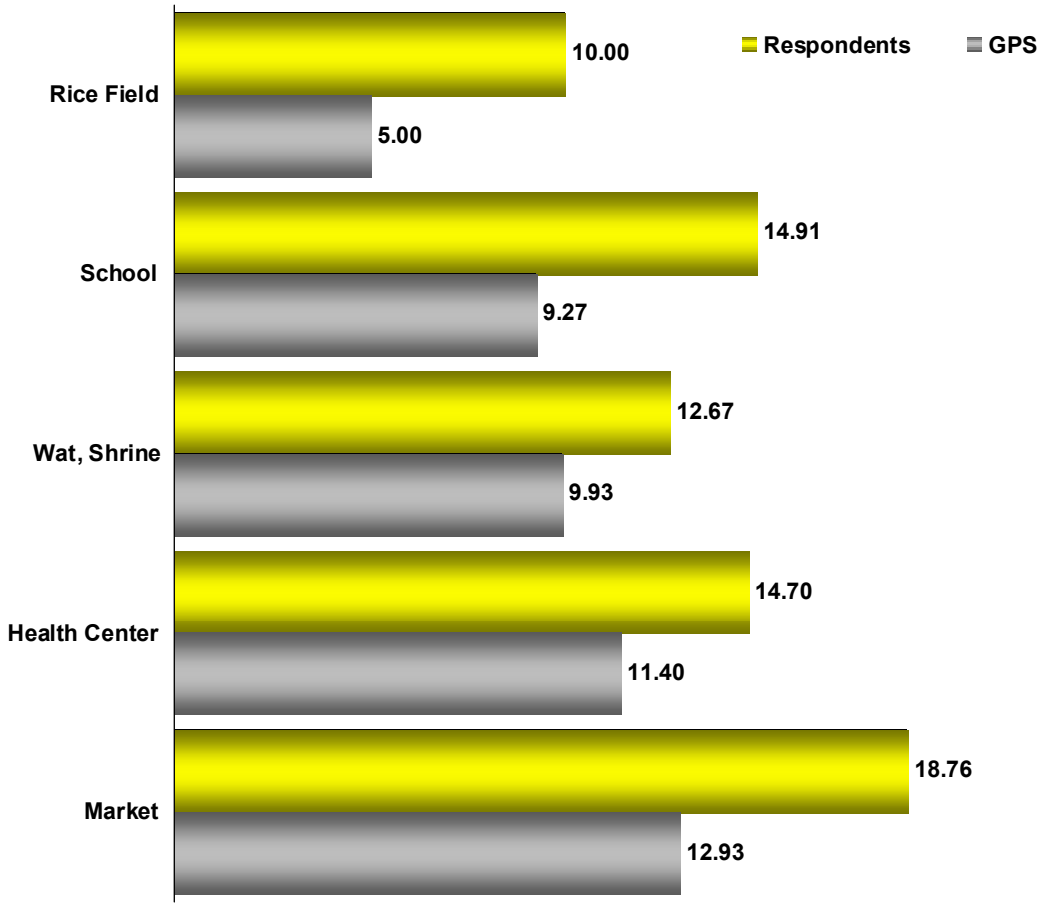


- Walking average times correspond overall with GPS times, but to a lesser extent than in Kg Cham.
- Respondents overestimate walking times by 28% of GPS for school and by 30% for rice paddies. On the other hand, the understimates for market and water are proportionally lower.
- Kg Speu's average times are the highest of the three provinces - this is attributable to the particularly impervious conditions of the Aural district.

Kg Speu -Time

Motorbike (21%) FROM home TO…

Respondents vs GPS (mins)

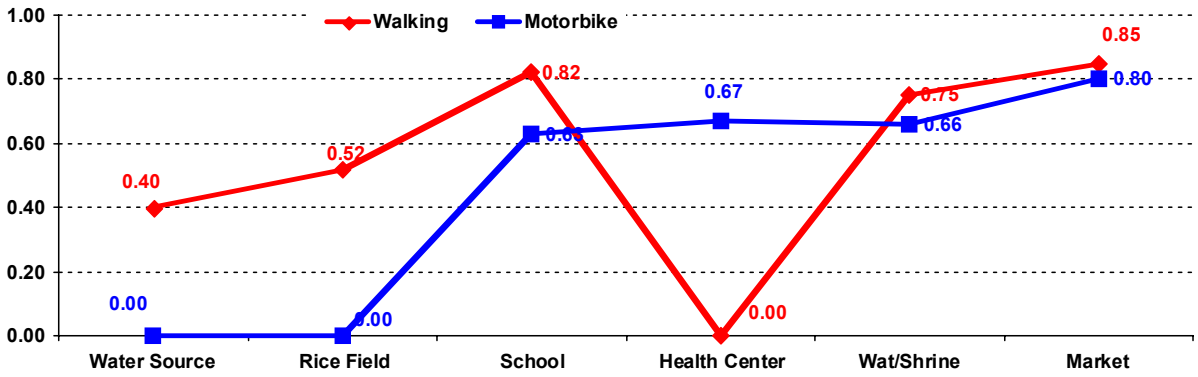


- Here again, motorbike use means absolute times increase (water has no respondents and rice has only 1 respondent).
- Respondents markedly overestimate travel times: between 61% and 28% of GPS times.
- Errors are higher than walking time errors (whereas in Kg Cham motorbike times were better approximations of real ones).

Kg Speu - Time

Correlation FROM home To…

Respondents vs GPS



Correlation Size	Strength of Relationship
0.8 to 1.0	Very high +ve correlation
0.6 to 0.8	High +ve correlation
0.4 to 0.6	Moderate +ve correlation
0.2 to 0.4	Low +ve correlation
0.2 to -0.2	No real correlation
-0.2 to -0.4	Low -ve correlation
-0.4 to -0.6	Moderate -ve correlation
-0.6 to -0.8	High -ve correlation
-0.8 to -1.0	Very High -ve correlation

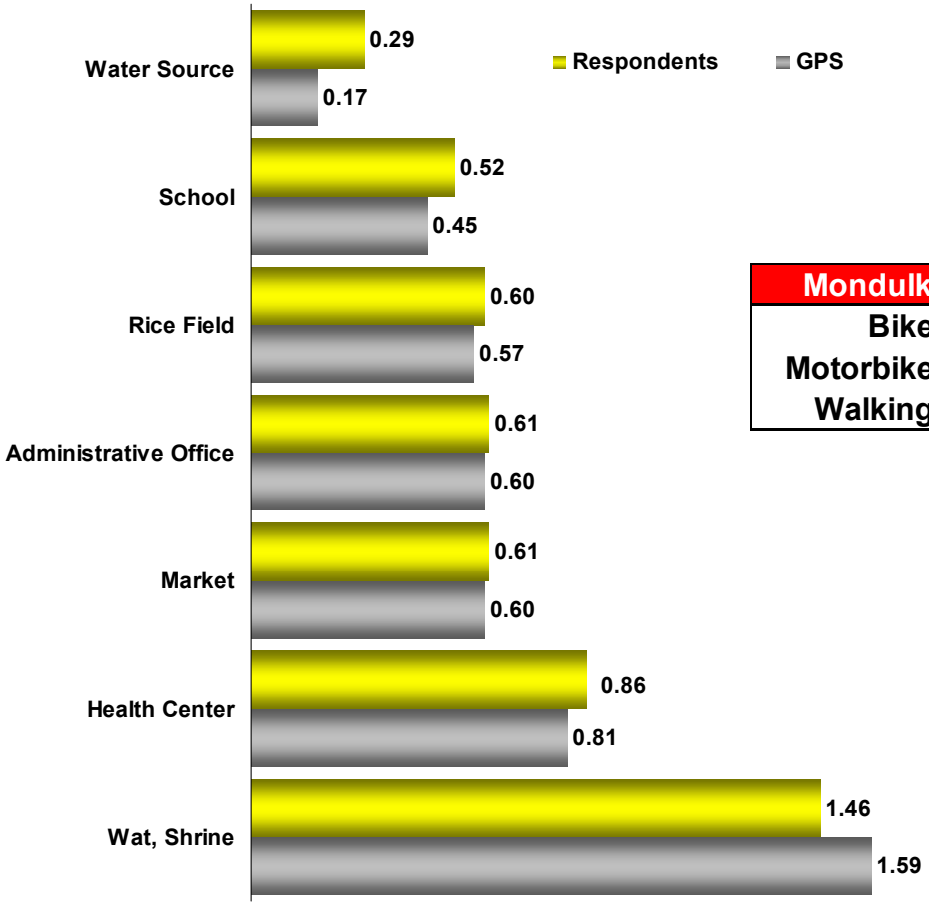
- The most interesting Kg Speu time correlation data are the similar profiles of walking and motorbike (excluding of course where data are absent or insufficient): however, in both cases we have a majority of overestimates
- Walking. There is high or very high correlation between respondents' and GPS walking times to school, wat and market. There is a moderate correlation for water and rice.
- Motorbike. Results parallel walking. High or very high correlations for school, wat, and market - and health centre.

Part IV - Mondulkiri

Mondulkiri - distances

Mean distances FROM home TO…

Respondents vs GPS (kms)



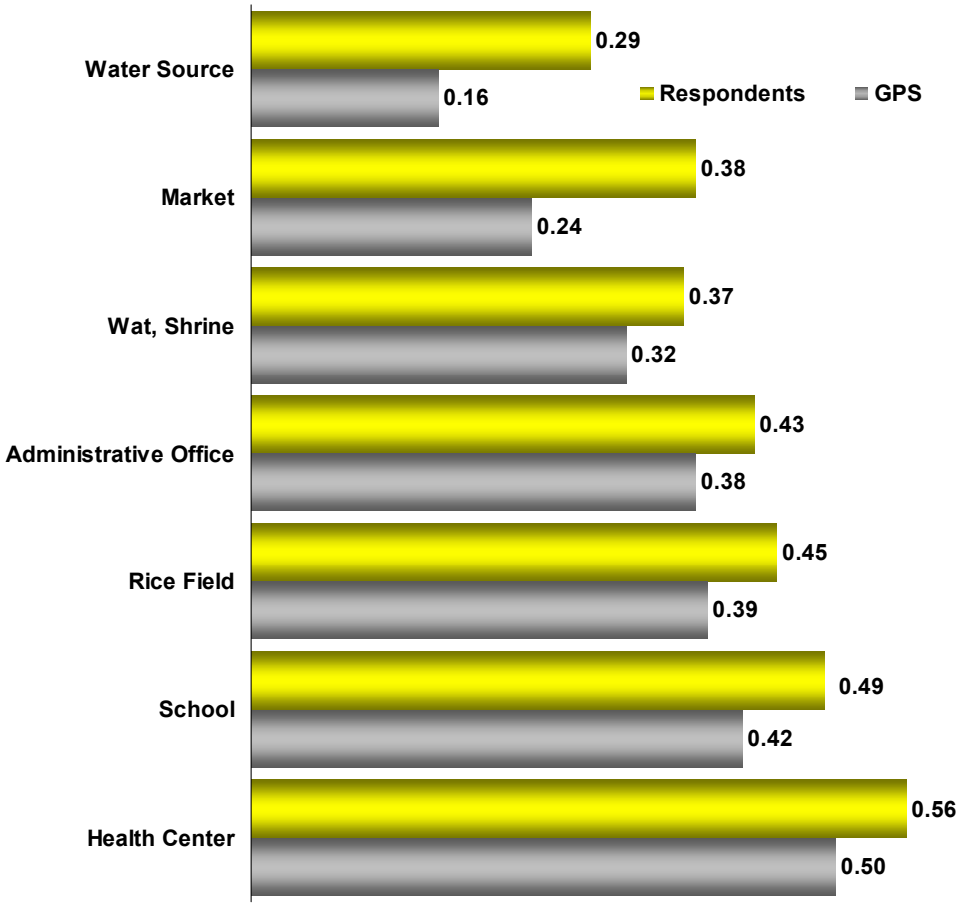
Mondulkiri most used	
Bike	1%
Motorbike	9%
Walking	90%

- In Mondulkiri the average distances' distribution changes slightly: Wats are farthest, reflecting the fact that the majority of the province's population are animist.
- Administration offices are used more - because they provide a wider sort of services than in other provinces -, and are closer.
- Here, mean distances mean in practice only walking and motorbike.

Mondulkiri - distances

Walking (90%) FROM home TO…

Respondents vs GPS (kms)

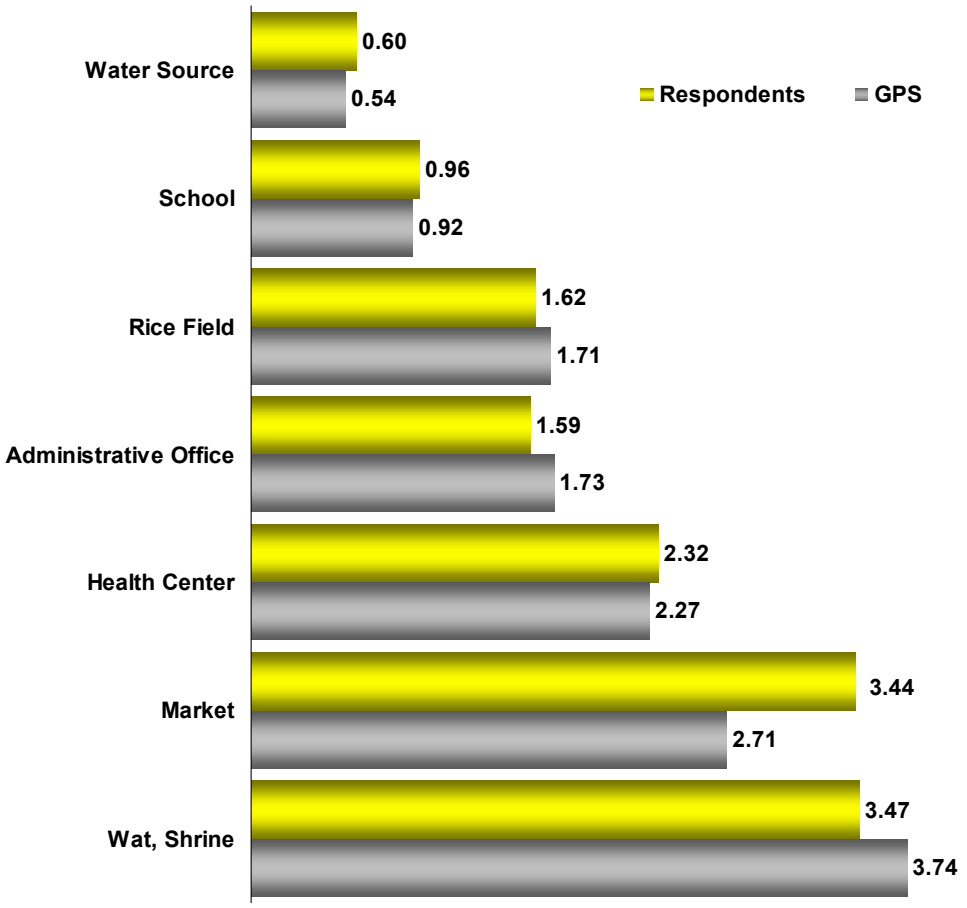


- Distances are averages, and represent the overwhelming majority of distances in Mondulkiri.
- For those who walk, water sources are, as elsewhere, the closest destinations; followed by markets, wats and administration offices. All walking distances are short (500m or less - in Kg Cham they were ≤600, in Kg Speu ≤750).
- Here again, the largest errors are on the shortest distances, both in absolute values and in percentages; there are no significant differences from the other two provinces.
- There is a good fit, but with a constant overestimation - which does not occur in the other two provinces.

Mondulkiri - distances

Motorbike (9%) FROM home TO…

Respondents vs GPS (kms)

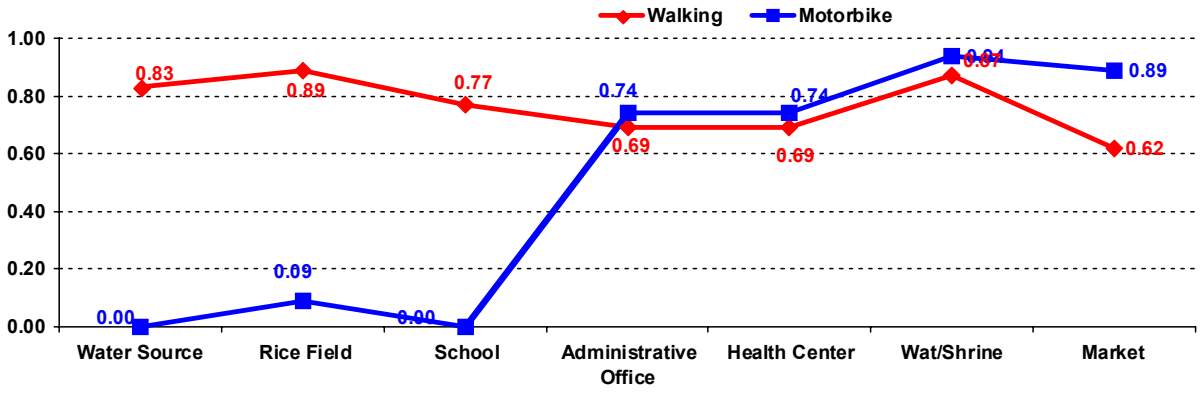


- The figures for water and school are 3 each - too low to be significant. Rice fields are also very low.
- Distances covered by motorbike are shorter than both Kg Speu and Kg Cham.
- In Mondulkiri there is a good fit between respondents and GPS - and not all distances are overestimated. However, data are limited.

Mondulkiri - distances

Correlation FROM home To…

Respondents vs GPS



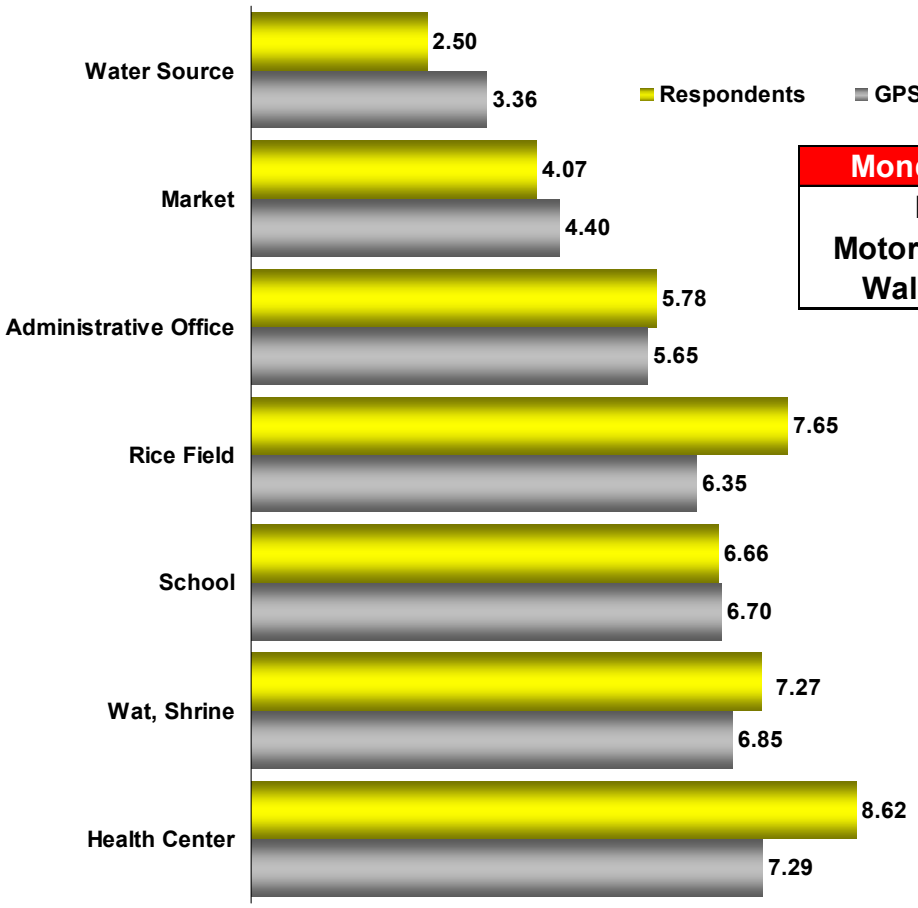
Correlation Size	Strength of Relationship
0.8 to 1.0	Very high +ve correlation
0.6 to 0.8	High +ve correlation
0.4 to 0.6	Moderate +ve correlation
0.2 to 0.4	Low +ve correlation
0.2 to -0.2	No real correlation
-0.2 to -0.4	Low -ve correlation
-0.4 to -0.6	Moderate -ve correlation
-0.6 to -0.8	High -ve correlation
-0.8 to -1.0	Very High -ve correlation

- Mondulkiri's results show good distance correlation for all significant cases: closer to the leavel of Kg Cham than to Kg Speu.
- Walking. There is a high or very high correlation between respondents' and GPS walking distances to all destinations. It is independent from distance.
- Motorbike. High or very high correlations for all significant data, again independent from distance.

Mondulkiri - time From

Mean times FROM home TO…

Respondents vs GPS (mins)



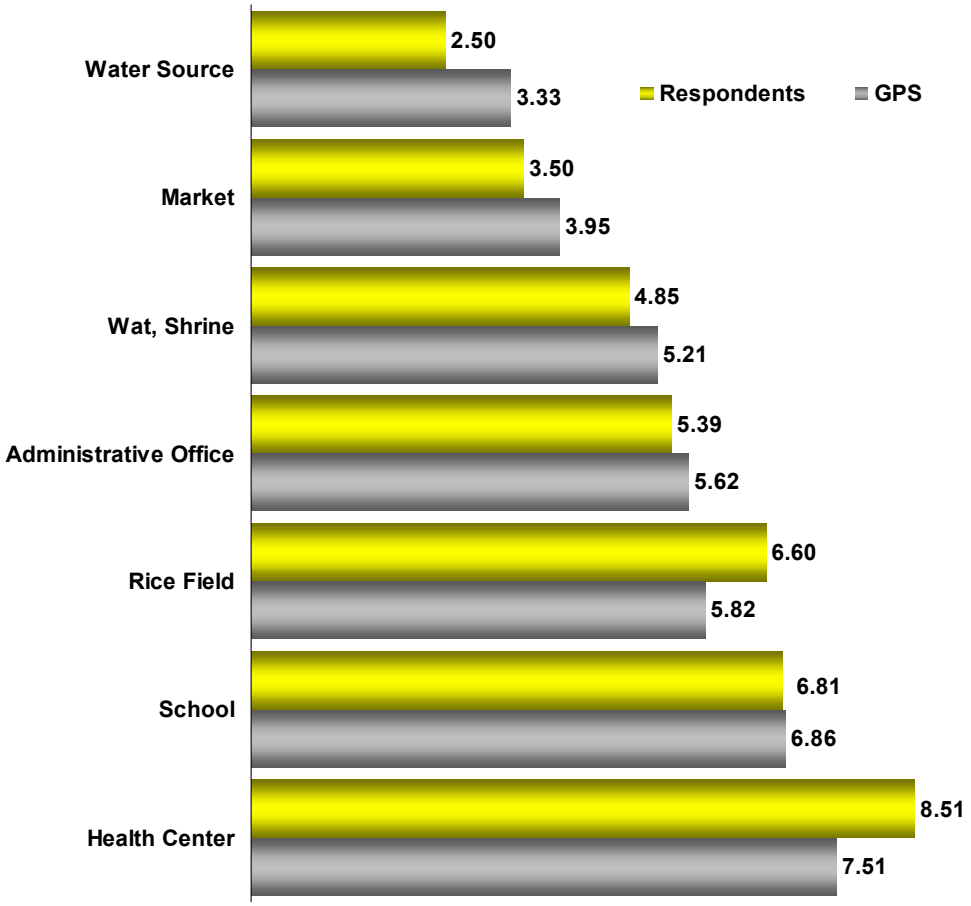
Mondulkiri most used	
Bike	1%
Motorbike	9%
Walking	90%

- There is a good fit between perceived times and GPS-measured ones.
- On average, the longest times are overestimated; this is explained by the fact that all motorbike times are overestimated.

Mondulkiri - Time

Walking (90%) FROM home TO…

Respondents vs GPS (mins)

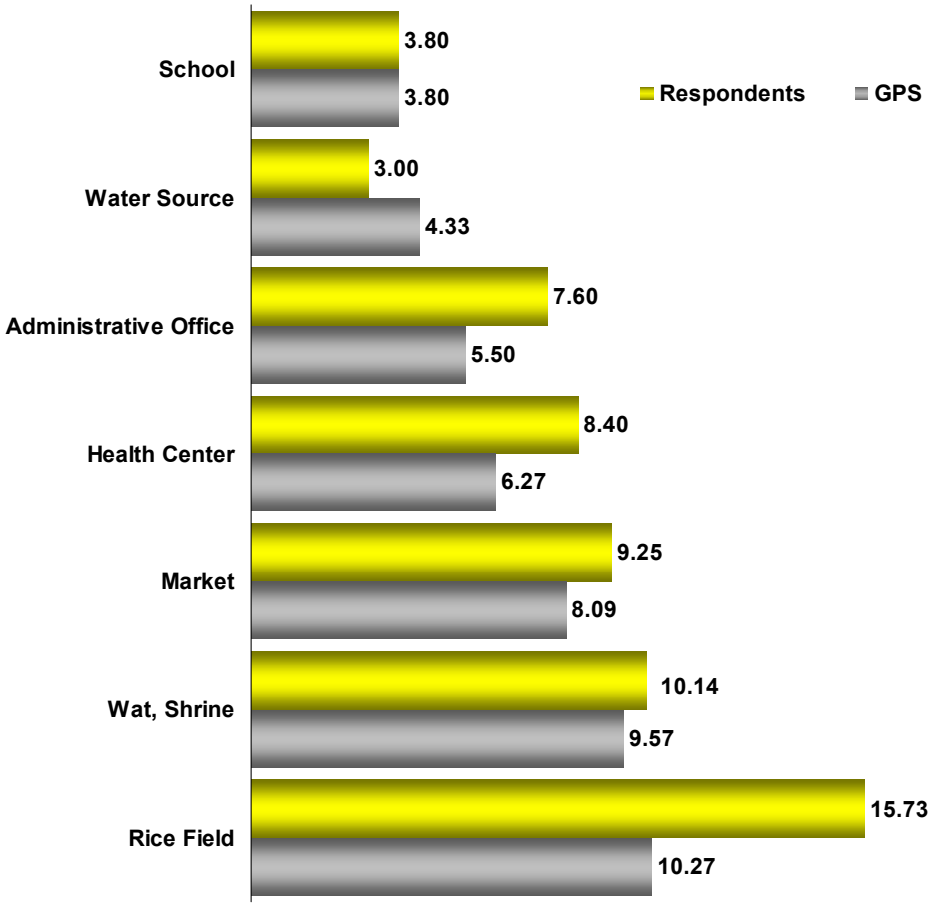


- Walking average estimated times have exactly the same profile than estimated distances.
- However, the times' estimates offer a closer approximation to GPS than distances. This is different from the other two provinces.
- Inaccuracy is proportionally greater on the shorter times
- Mondulkiri's average times are close to Kg Cham's - with the exception of water sources, which in Kg Cham are much closer.

Mondulkiri - Time

Motorbike (9%) FROM home TO…

Respondents vs GPS (mins)

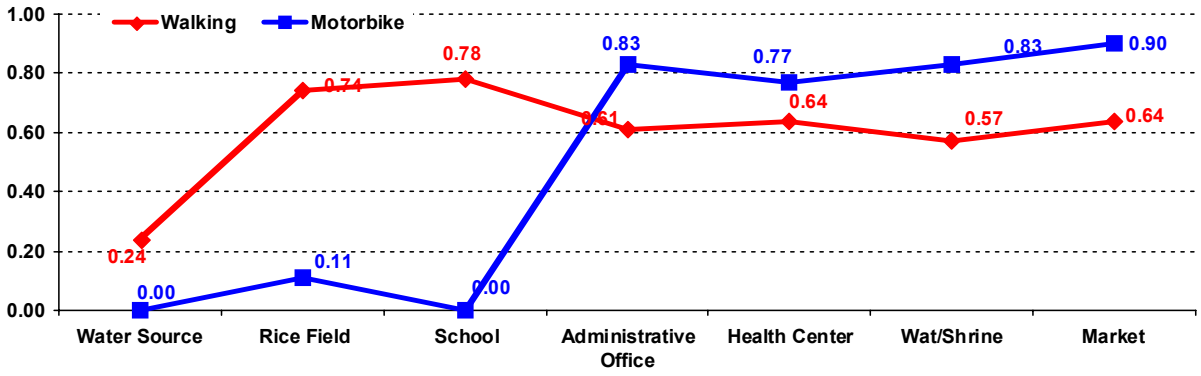


- Again, motorbikes are used only for longer trips (water and school are not significant).
- Respondents markedly overestimate travel times, independently from distance.

Mondulkiri - Time

Correlation FROM home To…

Respondents vs GPS

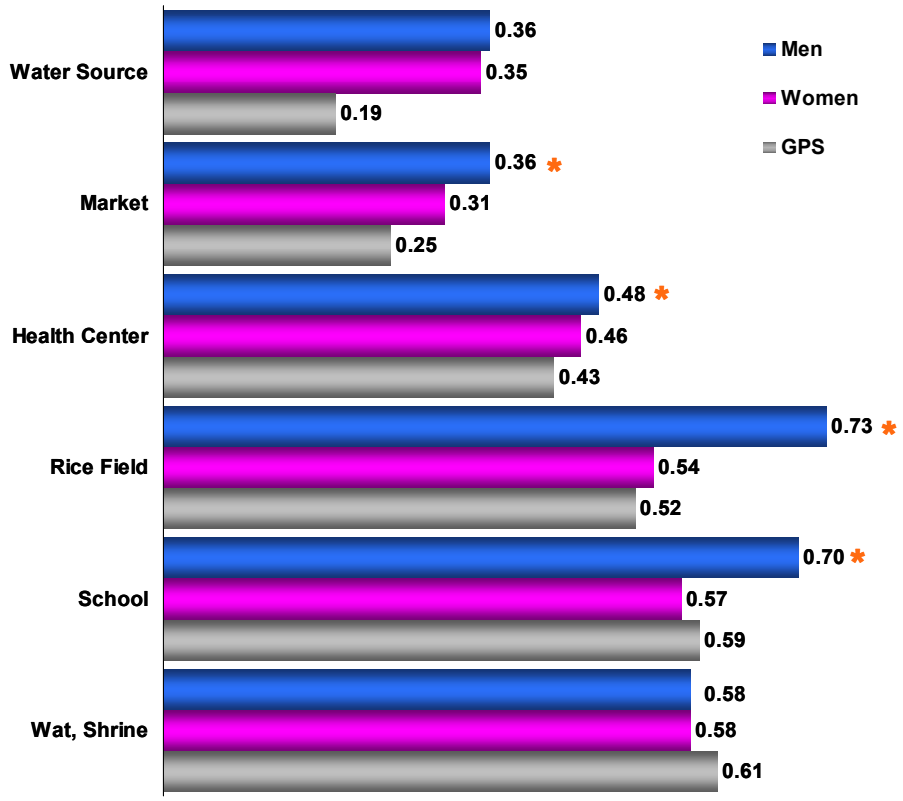


Correlation Size	Strength of Relationship
0.8 to 1.0	Very high +ve correlation
0.6 to 0.8	High +ve correlation
0.4 to 0.6	Moderate +ve correlation
0.2 to 0.4	Low +ve correlation
0.2 to -0.2	No real correlation
-0.2 to -0.4	Low -ve correlation
-0.4 to -0.6	Moderate -ve correlation
-0.6 to -0.8	High -ve correlation
-0.8 to -1.0	Very High -ve correlation

- Mondulkiri's time correlation profiles of walking and motorbike are fairly similar to each other (when there are sufficient data). Actually, motorbike data offer a better correlation, even if they were regularly overestimated..
- Walking. There is a high correlation between respondents' and GPS walking times to all destinations.
- Motorbike. Very high or high correlation to all destinations available.

Segmentation Analysis

Kg Cham - distances
Walking (60%) FROM home TO…
GENDER vs GPS (kms)



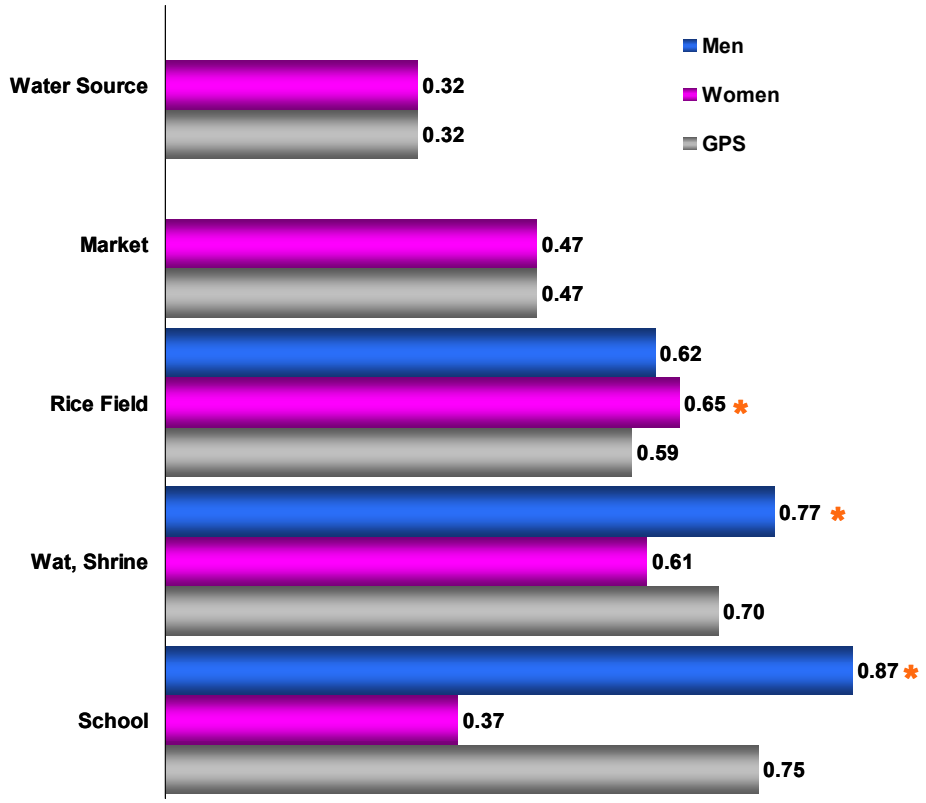
- *Only walking will be considered, because it presents a sufficient number of cases for all provinces and nearly all destinations.*
- *However, whereas for a variable such as gender there is a sufficient distribution of men and women for (nearly) all destinations, for age and especially education the samples' small size creates considerable significance gaps.*
- Kg Cham - distances. In 4 cases, men's estimates are significantly greater than women's.
- Exceptions: water and wat.

(The star * indicates the instances when the differences between values are statistically significant.)

Kg Speu - distances

Walking (61%) FROM home TO…

GENDER vs GPS (kms)

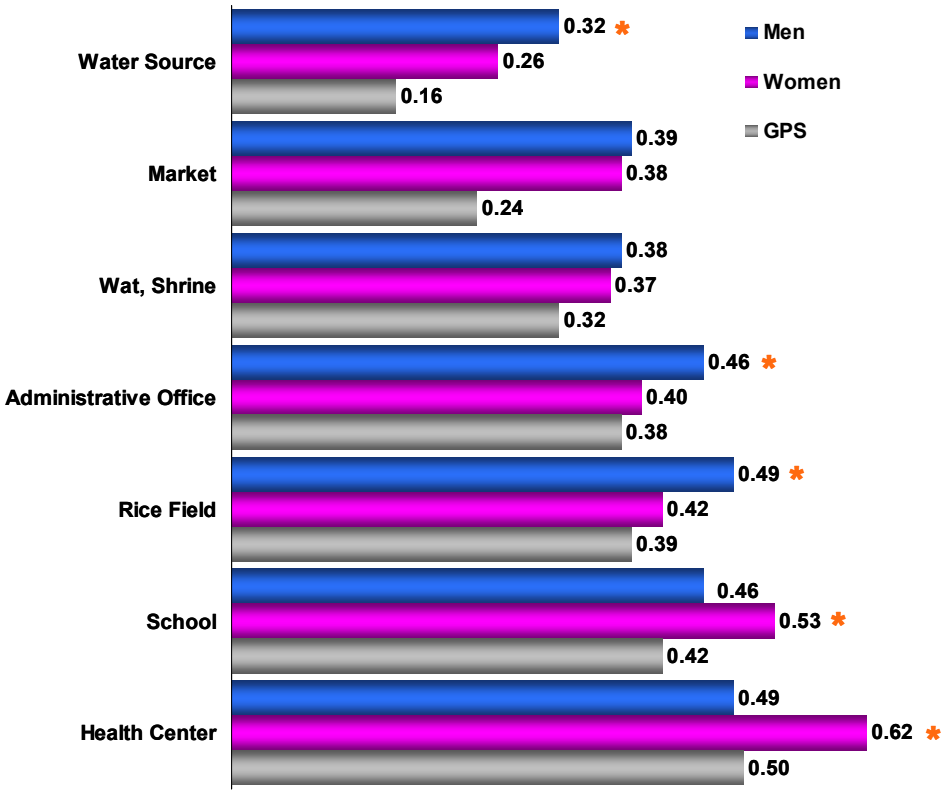


- In 2 cases (wat and school) men's distance estimates are significantly higher than women's.
- In one case (rice fields) women's estimates are (just) significantly higher.

Mondulkiri - distances

Walking (90%) FROM home TO…

GENDER vs GPS (kms)

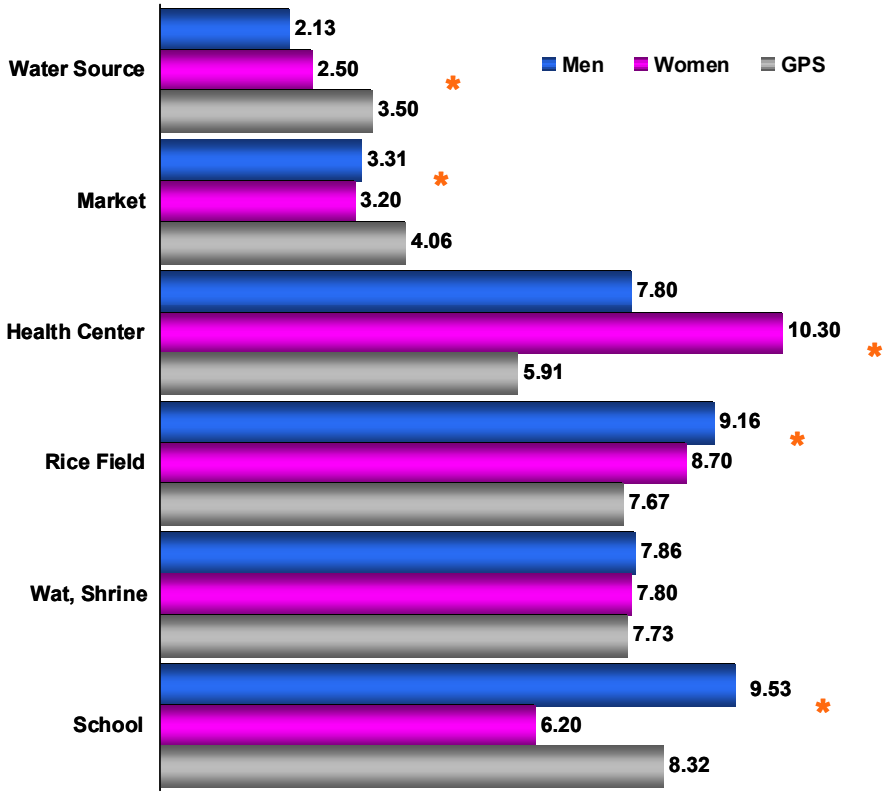


- In 3 cases (water, admin, rice) men are significantly higher.
- In 2 cases, women are.
- *On the basis of these limited data, one can advance the following hypotheses (which should be tested more extensively):*
- *Men tend to overestimate walking distances more than women.*
- *Destinations are irrelevant to gender differences.*

Kg Cham - time From

Walking (60%) FROM home TO…

GENDER vs GPS (mins)



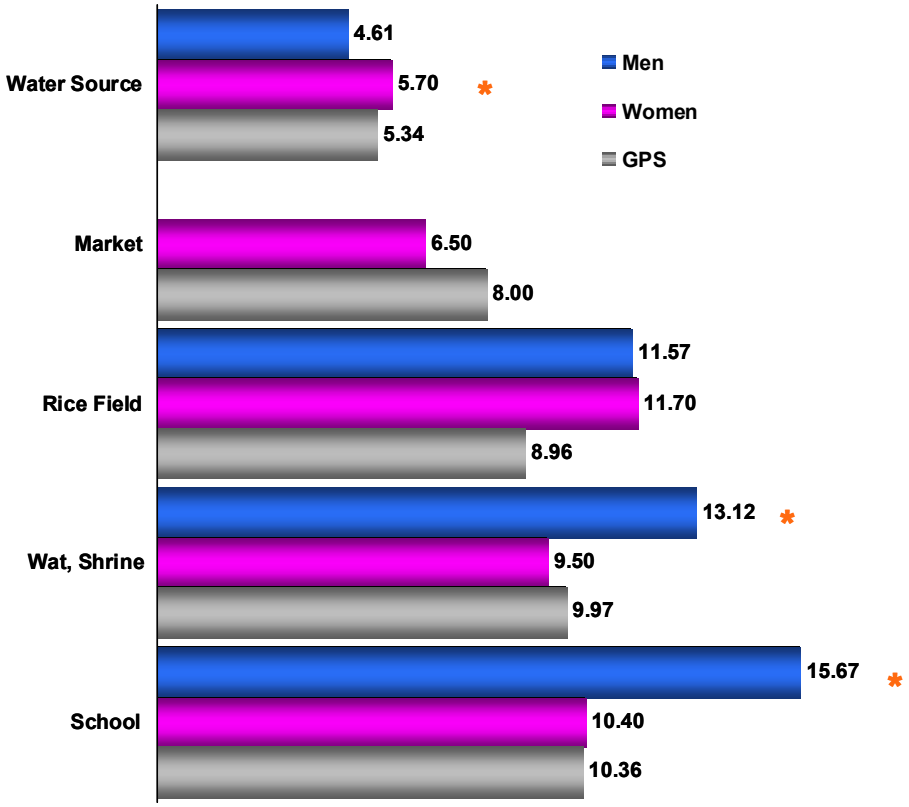
In 3 cases (rice, school, market) men are significantly higher than women.

In 2 other cases (water, HC) women are higher.

Kg Speu - time From

Walking (61%) FROM home TO…

GENDER vs GPS (mins)



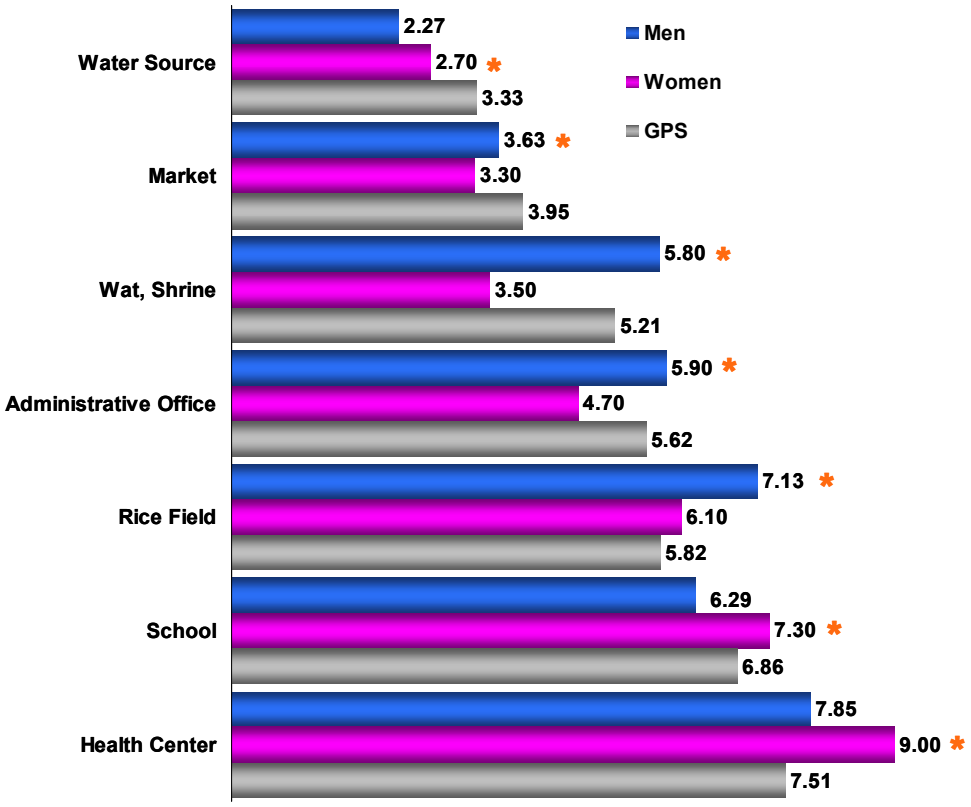
Men significantly higher: 2 cases (wat, school)

Women: 1 case (water)

Mondulkiri - time From

Walking (90%) FROM home TO…

GENDER vs GPS (mins)

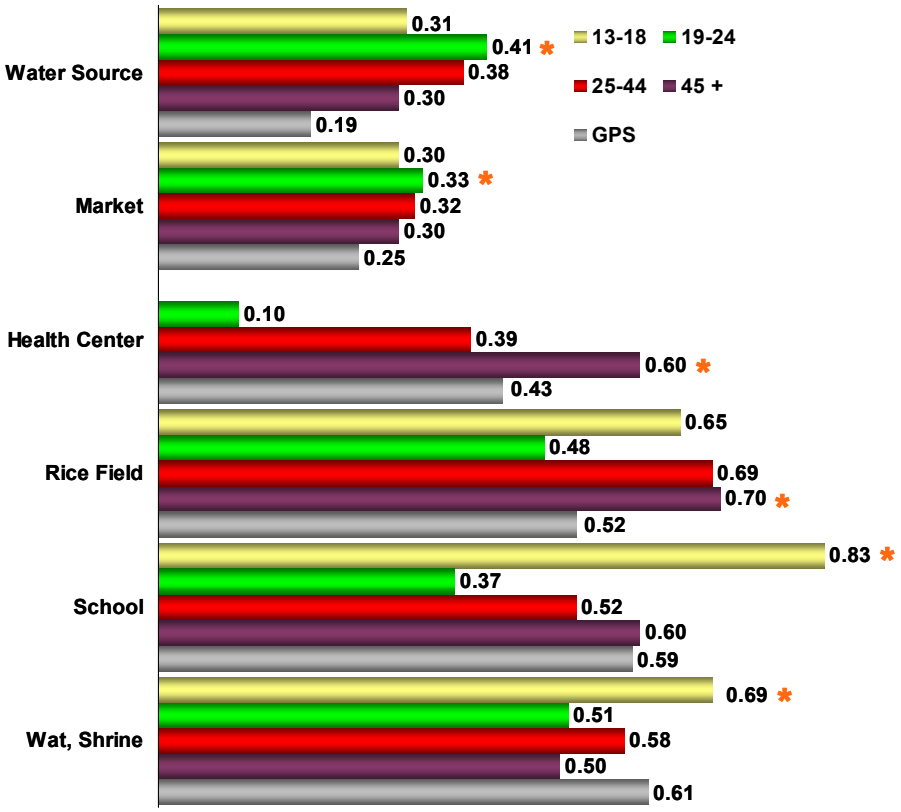


- Men are higher than women in 4 cases (market, wat, admin, rice).
- Women are significantly higher in the other three cases.
- *There are no sufficient elements to assume that gender influences time evaluations (although men overestimate more than women)*

Kg Cham - distances

Walking (60%) FROM home TO…

AGE vs GPS (kms)

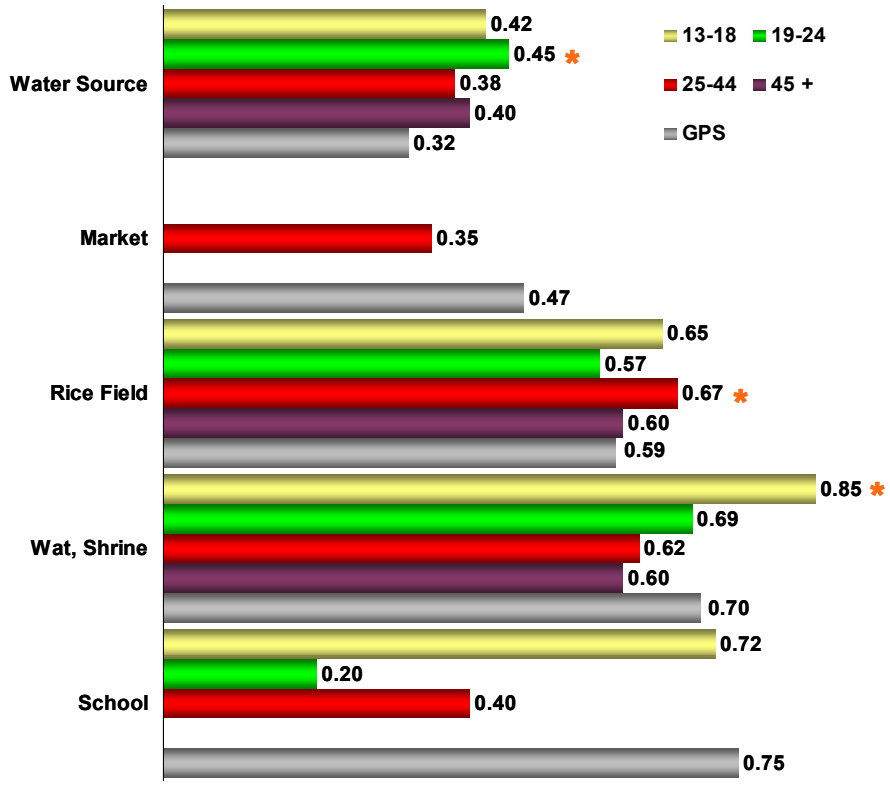


- Best approximation to GPS is by the oldest in 3 cases (water, market, school)
- By adults in 2 cases (HC, wat)
- By young in 1 case (rice)

Kg Speu - distances

Walking (61%) FROM home TO…

AGE vs GPS (kms)

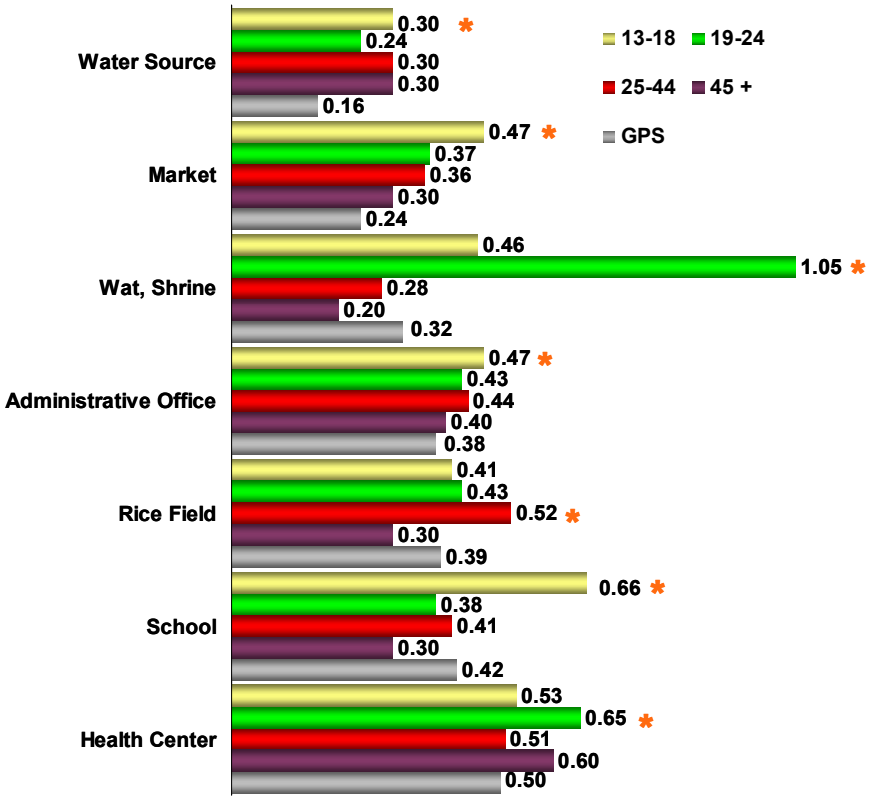


Best approximation: young 1, adults 1, oldest 1

Mondulkiri - distances

Walking (90%) FROM home TO…

AGE vs GPS (kms)



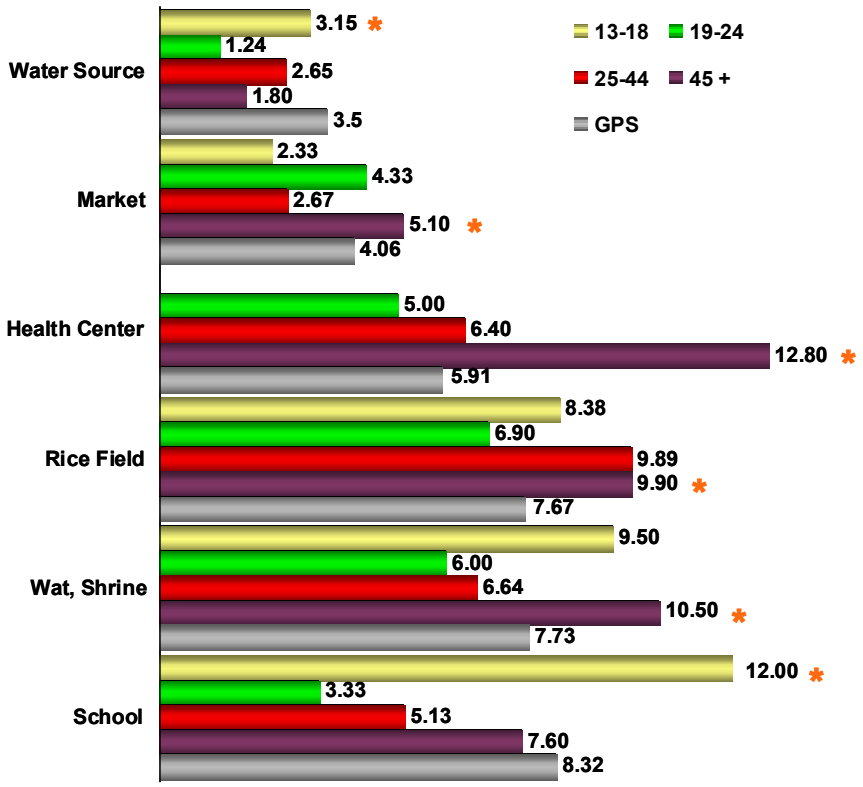
Best approximation: youngest 1, young 1, adult 3, oldest 2.

Hypothesis to test: distance estimates by people over 25 are more reliable than the younger people's.

Kg Cham - time From

Walking (60%) FROM home TO…

AGE vs GPS (mins)

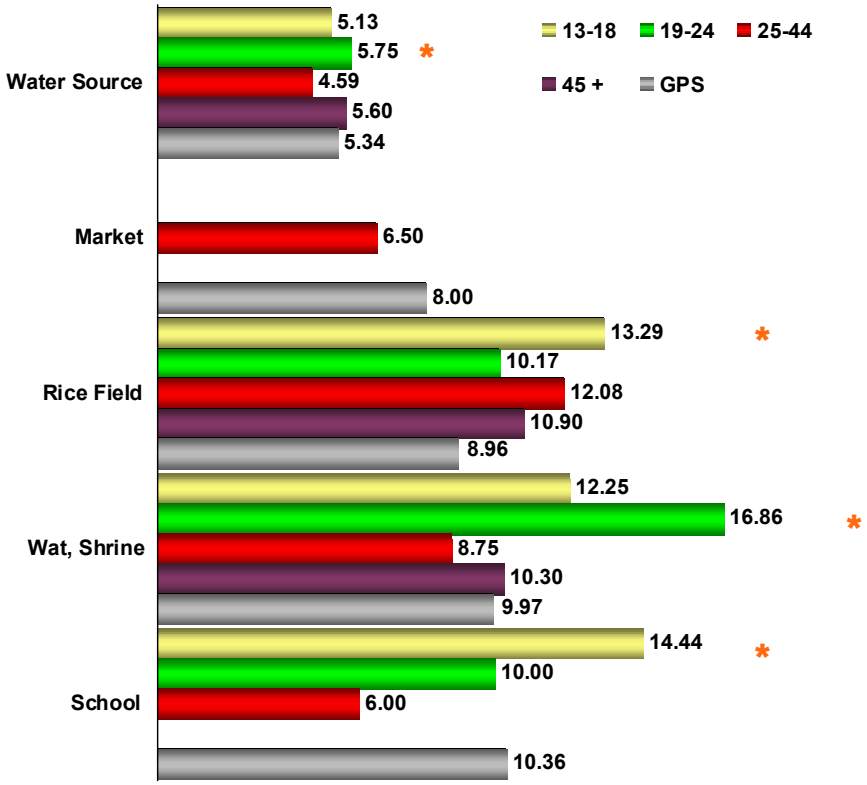


Best approximations: youngest 1, young 2, adults 2, oldest 1

Kg Speu - time From

Walking (61%) FROM home TO…

AGE vs GPS (mins)

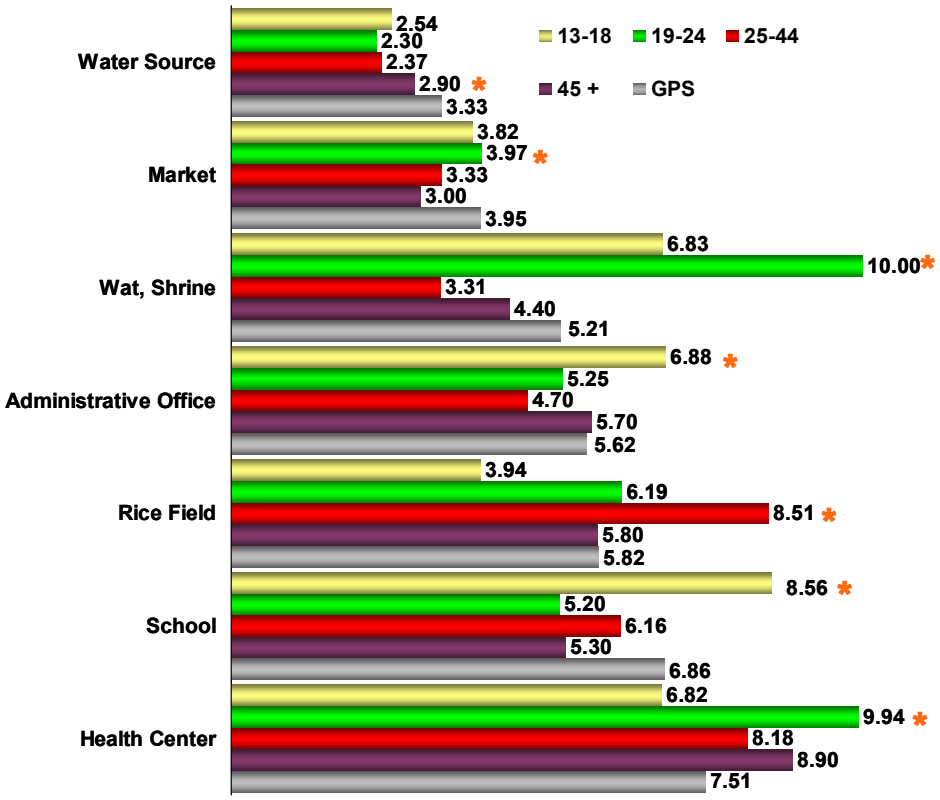


Best approximations: youngest 1, young 2, oldest 1

Mondulkiri - time From

Walking (90%) FROM home TO…

AGE vs GPS (mins)

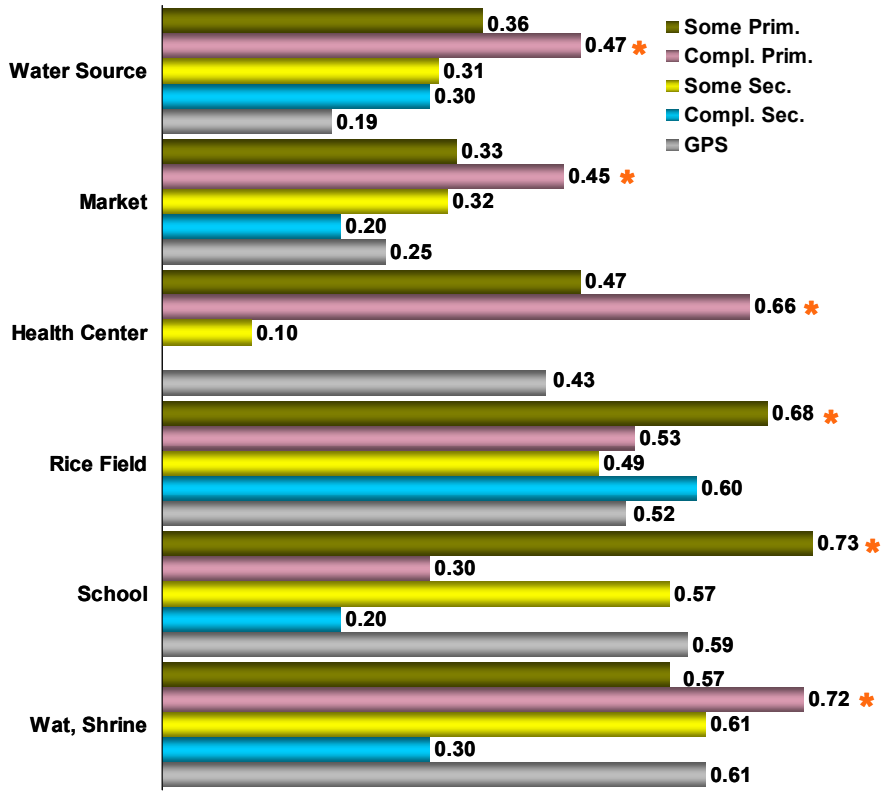


- Best approximations: young 1, adult 2, oldest 4.
- *There are no sufficient elements to assume that age influences time estimates (although the two older age groups seem slightly more reliable).*

Kg Cham - distances

Walking (60%) FROM home TO…

EDUCATION vs GPS (kms)

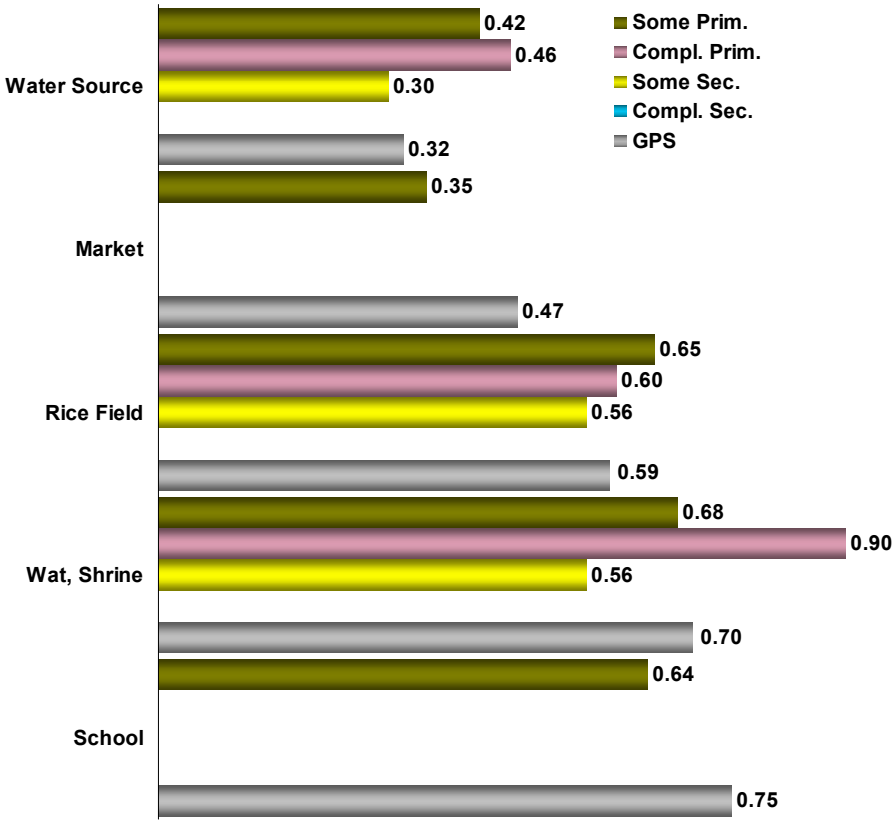


Best approximations (ignoring completed secondary school - only 2% of the sample): primary 1, some secondary 4.

Kg Speu - distances

Walking (61%) FROM home TO…

EDUCATION vs GPS (kms)

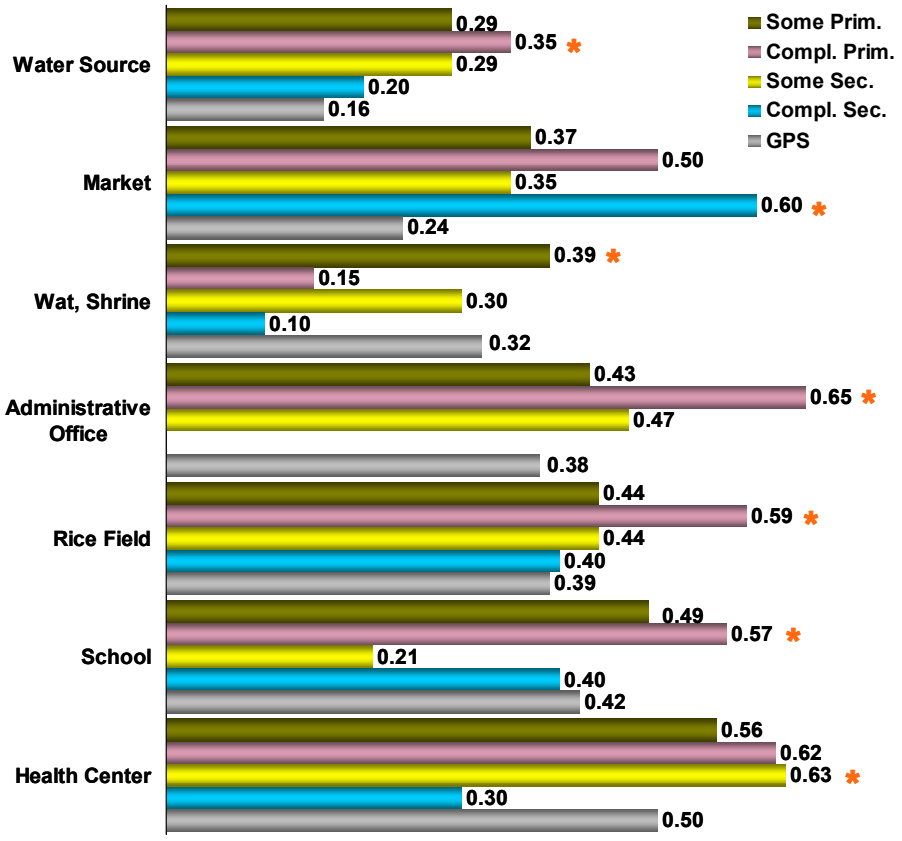


Best approximations: some primary 1, primary 1, some secondary 1.

Mondulkiri - distances

Walking (90%) FROM home TO…

EDUCATION vs GPS (kms)

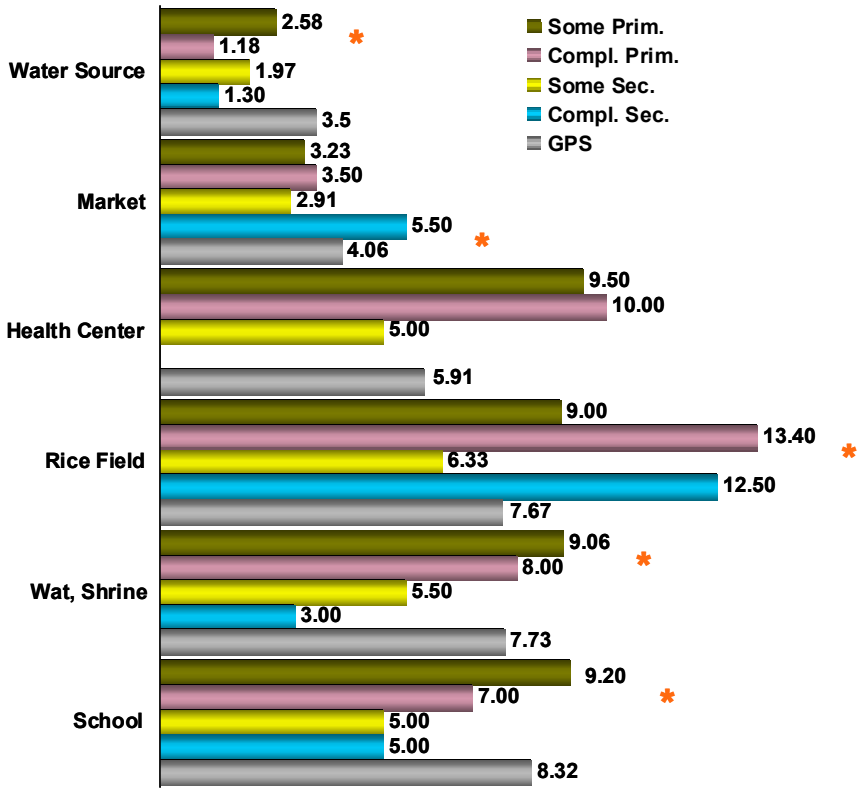


- Best approximations: some primary 4, some secondary 4.
- *There are some indications that higher education levels correlate to better approximations of distances.*

Kg Cham - time From

Walking (60%) FROM home TO…

EDUCATION vs GPS (mins)

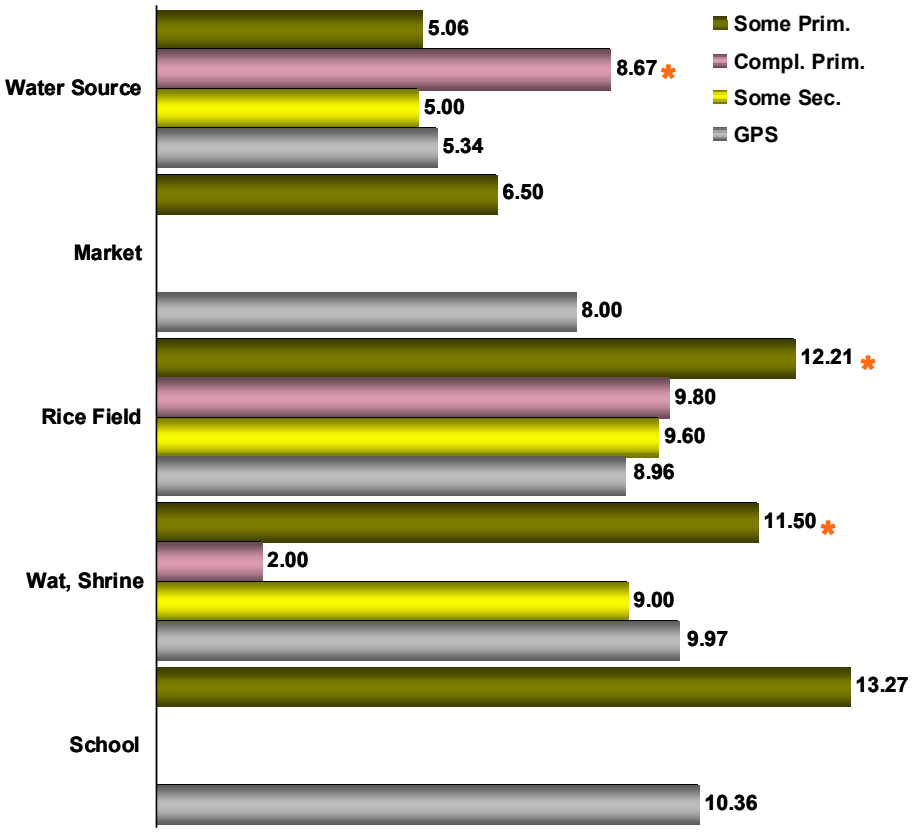


Best approximations: less educated 3, primary 2, some secondary 1

Kg Speu - time From

Walking (61%) FROM home TO…

EDUCATION vs GPS (mins)

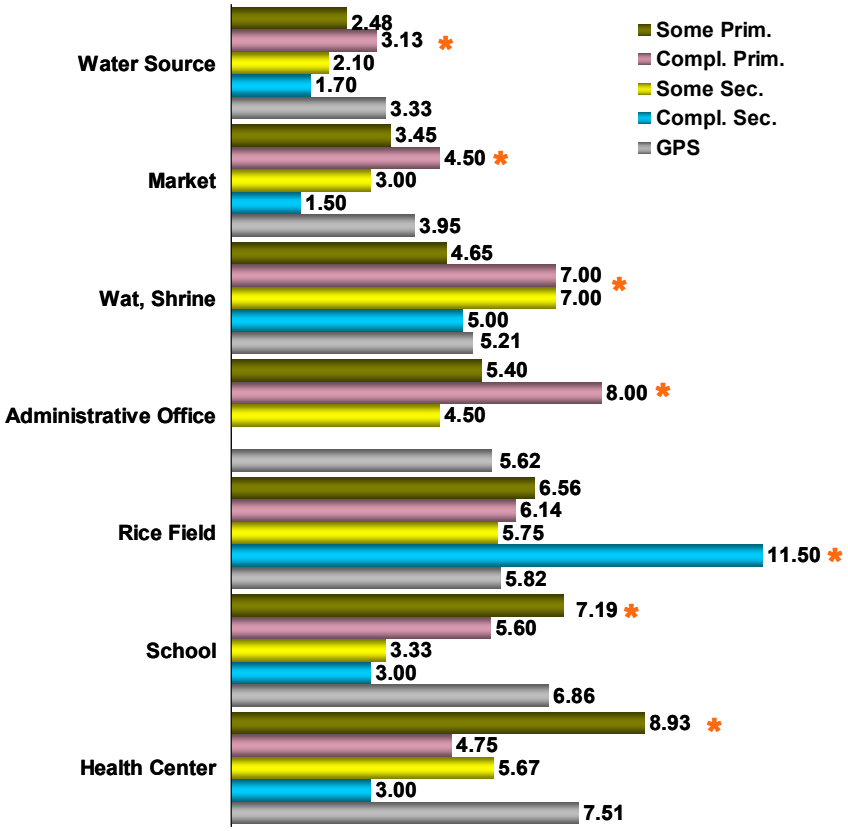


Best approximations: less educated 1, some secondary 2

Mondulkiri - time From

Walking (91%) FROM home TO…

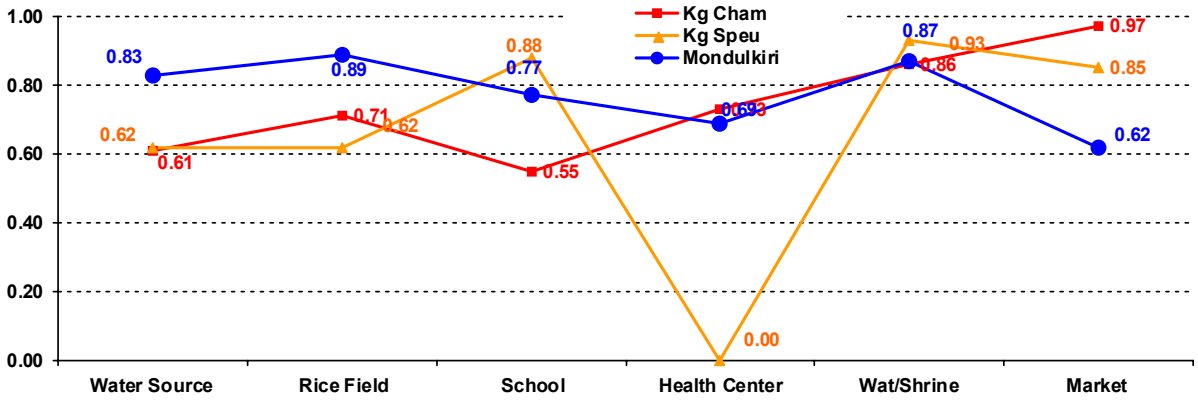
EDUCATION vs GPS (mins)



- Best approximations: some primary 5, primary 1, some secondary 1.
- *There seems to be no correlation between times' estimations and educational levels.*

Comparisons and Conclusions

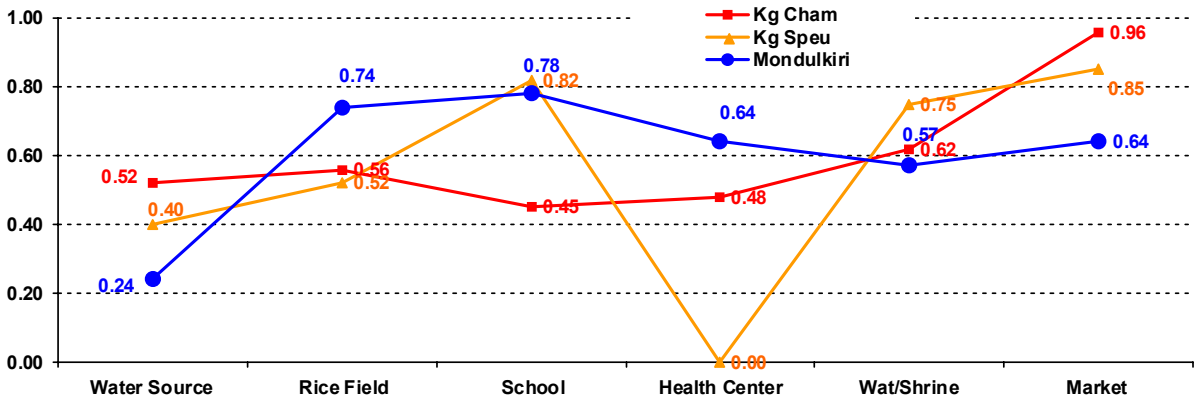
3 provinces - DISTANCES
WALKING
Respondents vs GPS



- The three provinces' profiles are fairly similar. In general there is a high or very high correlation between perceived walking distances and actual ones - i.e. they vary proportionally together.
- Thus, estimated distances are good indicators (in absolute terms, errors on walking distances rarely amount at more than 100 metres - but in all 3 provinces distances are quite short).
- Destinations don't seem to make much difference to correlation levels. The best correlations are for Wats.
- (Administrative offices are omitted because only in Mondulkiri there is a sufficient number of respondents who go there. Nobody walks to health centres in Kg Speu.)

Correlation Size	Strength of Relationship
0.8 to 1.0	Very high +ve correlation
0.6 to 0.8	High +ve correlation
0.4 to 0.6	Moderate +ve correlation
0.2 to 0.4	Low +ve correlation
0.2 to -0.2	No real correlation
-0.2 to -0.4	Low -ve correlation
-0.4 to -0.6	Moderate -ve correlation
-0.6 to -0.8	High -ve correlation
-0.8 to -1.0	Very High -ve correlation

3 provinces - TIMES
WALKING
Respondents vs GPS

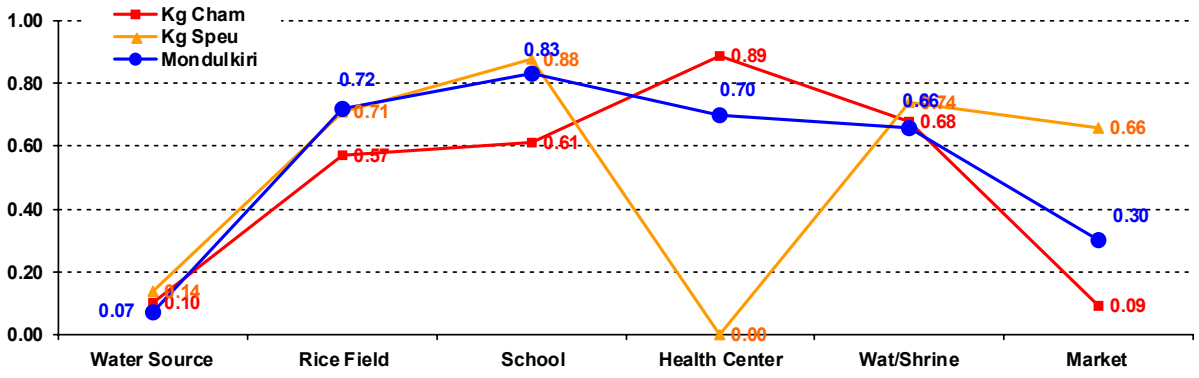


- In the case of perceived walking time vs GPS time, the three correlations profiles show weaker correlations than the distance ones: most are moderate to high.
- Provinces are in general quite close, with Mondulkiri having marginally the best profile, perhaps because they have on the whole the shortest distances (3 to 7 minutes).
- Quantitatively, respondents tended to overestimate walking times. The biggest percentage error margins were for the closest destinations (especially water, which also has the lowest correlation).
- One must remember GPS time is obtained by timing one steady walk, whereas respondents' time also accounts for encounters, chats etc…
- Perceived walking times show on the whole an acceptable level of correlation with actual times; they seem to be less reliable for short distances.

Correlation Size	Strength of Relationship
0.8 to 1.0	Very high +ve correlation
0.6 to 0.8	High +ve correlation
0.4 to 0.6	Moderate +ve correlation
0.2 to 0.4	Low +ve correlation
0.2 to -0.2	No real correlation
-0.2 to -0.4	Low -ve correlation
-0.4 to -0.6	Moderate -ve correlation
-0.6 to -0.8	High -ve correlation
-0.8 to -1.0	Very High -ve correlation

3 provinces:
DISTANCE & TIME - 1

WALKING
Respondents' distance vs respondents' time

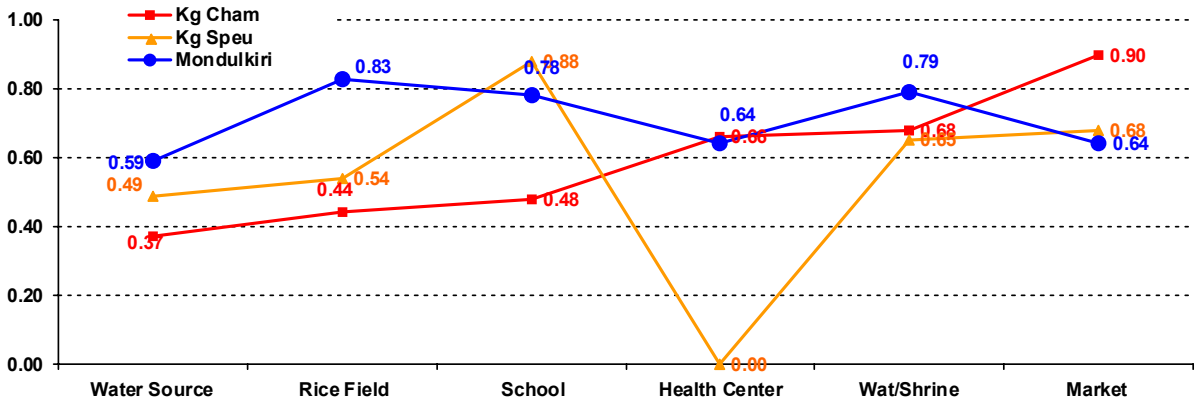


- With the exception of water and markets, where the correlation level is low or at most moderate, the other perceived distance/ perceived time correlations are high or very high in all three provinces.
- Times and distances to wats, schools and ricefields are the best correlated in all three provinces: this is probably because they are routine destinations, but not as close as water.
- Most correlations are above .6; thus one can say that perceived walking distances vary with a good relation to perceived walking times.

Correlation Size	Strength of Relationship
0.8 to 1.0	Very high +ve correlation
0.6 to 0.8	High +ve correlation
0.4 to 0.6	Moderate +ve correlation
0.2 to 0.4	Low +ve correlation
0.2 to -0.2	No real correlation
-0.2 to -0.4	Low -ve correlation
-0.4 to -0.6	Moderate -ve correlation
-0.6 to -0.8	High -ve correlation
-0.8 to -1.0	Very High -ve correlation

3 provinces:
DISTANCE & TIME - 2

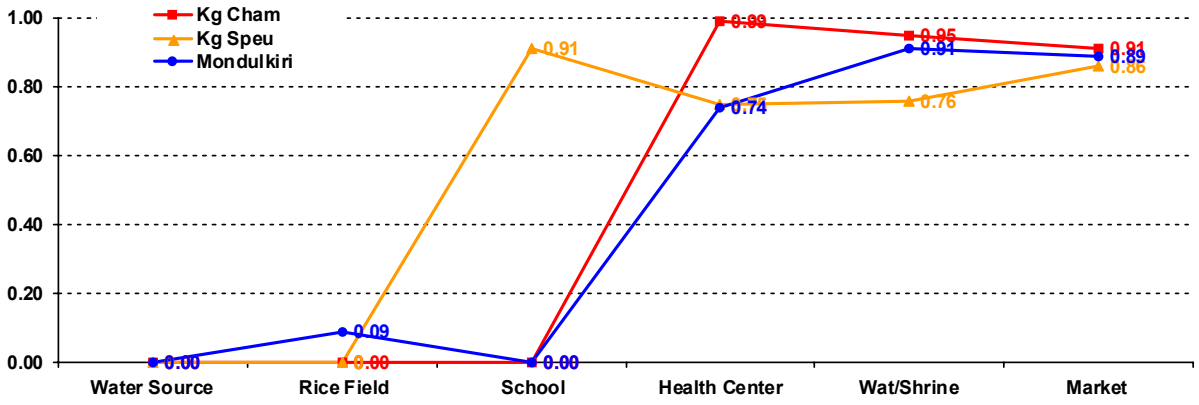
WALKING
GPS distance vs respondents' time



- In the case of correlation between GPS actual distance and respondents' time, the three provinces' profiles are again close.
- With GPS, respondents' subjectivity has been filtered out of distance, and the level of time/distance correlation increases for all destinations.
- Wats and markets, and to a lesser extent schools, show high correlation levels, for the reasons discussed previously. Water sources keep showing low or no correlation, again for the same reasons as before.

Correlation Size	Strength of Relationship
0.8 to 1.0	Very high +ve correlation
0.6 to 0.8	High +ve correlation
0.4 to 0.6	Moderate +ve correlation
0.2 to 0.4	Low +ve correlation
0.2 to -0.2	No real correlation
-0.2 to -0.4	Low -ve correlation
-0.4 to -0.6	Moderate -ve correlation
-0.6 to -0.8	High -ve correlation
-0.8 to -1.0	Very High -ve correlation

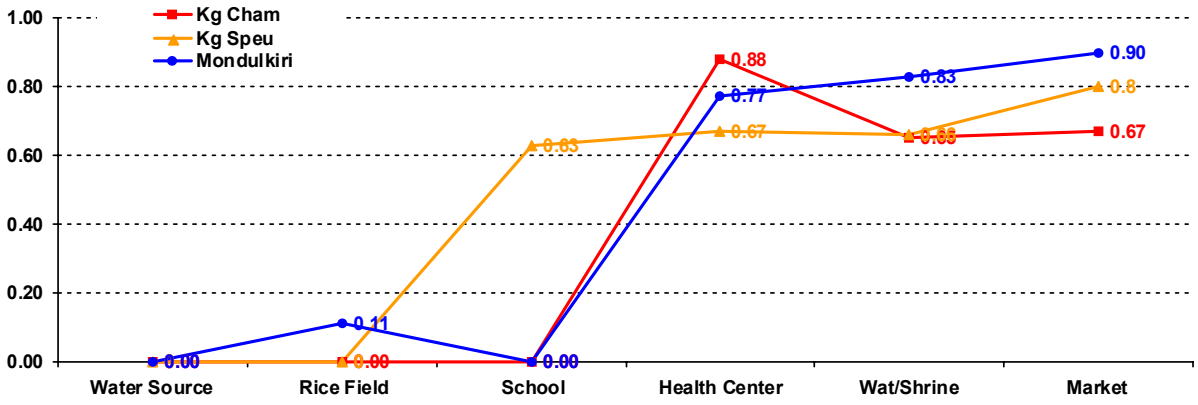
3 provinces - DISTANCES
MOTORBIKE
Respondents vs GPS



- There is a very high, or nearly very high, correlation between all motorbike perceived distances and the actual motorbike distances.
- The profile for all three provinces is very similar, and coincident in the case of markets - possibly the most common destination of motorbike trips.
- On the whole, motorbike distance estimates seem to vary in close relation with the actual distance variations; they are better correlated than walking distance estimates, in all three provinces.
- Of course, motorbike estimates cannot be used for close destinations.

Correlation Size	Strength of Relationship
0.8 to 1.0	Very high +ve correlation
0.6 to 0.8	High +ve correlation
0.4 to 0.6	Moderate +ve correlation
0.2 to 0.4	Low +ve correlation
0.2 to -0.2	No real correlation
-0.2 to -0.4	Low -ve correlation
-0.4 to -0.6	Moderate -ve correlation
-0.6 to -0.8	High -ve correlation
-0.8 to -1.0	Very High -ve correlation

3 provinces - TIMES
MOTORBIKE
Respondents vs GPS



- The correlation between perceived motorbike times and actual motorbike times is high, but not as high as for distances.
- Quantitatively, respondents' figures tended to overestimate times; however, the table shows that overestimates vary in proportion with actual times.
- There are no significant differences between provinces.

Correlation Size	Strength of Relationship
0.8 to 1.0	Very high +ve correlation
0.6 to 0.8	High +ve correlation
0.4 to 0.6	Moderate +ve correlation
0.2 to 0.4	Low +ve correlation
0.2 to -0.2	No real correlation
-0.2 to -0.4	Low -ve correlation
-0.4 to -0.6	Moderate -ve correlation
-0.6 to -0.8	High -ve correlation
-0.8 to -1.0	Very High -ve correlation

Summary Comments

Response to Key Questions

How reliable are reported distances as proxies of actual distances?

- Perceived walking distances are generally a more reliable indicator than perceived walking time. They don't show consistent over/under estimates, and have a high correlation with GPS distances.
- Perceived motorbike distances are more reliable than perceived walking distances, with a very high correlation with actual distances.
- In percentage terms, errors in perceived walking distances are highest on the shortest trips (e.g. water) - even if in absolute terms they're small.

How reliable are reported times as proxies of actual times?

- Perceived walking times tend to be overestimated by respondents
- Perceived motorbike travel time is overestimated, but to lesser extent than walking.
- Both for walking and motorbike, perceived times' correlation with GPS times is good, but not as good as its distances equivalent.
- Travel time "from home to destination" is more reliable (closer to actual GPS verification times) than travel time stated "from destination to home".
- The better state of roads, and the larger size of the road network, improve distance estimates. They improve time estimates as well, but not to the same extent.

How can travel times be explained by travel distances?

- **Respondents Perceived Walking time…**
  - Perceived walking times are well correlated with perceived walking distances – except for the closest (water) and farthest (market) destinations .
  - Perceived walking times are well correlated with actual GPS distance measurements, with moderate correlation levels for both water and market.
  - On the whole, perceived times can be a good predictor of distances - but possibly not in all cases. A wider range of cases should be examined.
- **Perceived Motorbike Travel Times**
  - Perceived motorbike times and motorbike distances are highly correlated, though not as highly as motorbike distances.

- Motorbike times are more reliable, albeit slight overestimated, predictors of travel times.
- Motorbike distances explain motorbike times better than in the case of walking
- Motorbike times can be used only for middle- and long-distance destinations.

What is the impact of personal characteristics on reported and actual travel times?

- In the majority of cases, destination frequencies are distributed by ascending distance thus: water, rice, administrative office, school, health centre, wat, market.
- Distance estimates for Rice & Admin are similar, as are School and Health Centre. However, their actual distance does not seem correlated to accuracy of estimates.
- Among all destinations, wats have the best time & distance correlations of respondent estimates and GPS verification both for distance and time; correlations for water sources were the lowest.
- This finding may be subject to some constant "external influences" – such as the ritual of going to the wat leads to a more acute consciousness of time and distance, going to water source means coming back carrying it (and thus is perceived as longer), etc.
- The data show that in most cases men tend to overestimate distance more than women; this is independent from destination.
- People over 25 tend to give better estimates of distances (and possibly of times). Education levels may be correlated to distances.
- However, the above hypotheses about gender, age and education need to be tested more extensively and with more specific research tools.

Which measure, time or distance, is recommended as probably more reliable and relevant under particular circumstances – and why?

- Distance should be preferred - they are better correlated with actual GPS data. Times however show themselves fairly reliable too.
- People seem more familiar with measures of distance than measures of time.
- Moreover, perceived time to any destination is subject to many factors (e.g. encounters, chats, weights carried etc), which cannot be adequately measured.

How should time and/or distance questions be best phrased in each survey country?

- Distances – measures of distance should be asked using a person's units, translating them in kms if needed. The best indicator of actual distance is the distance associated with their most common mode of transport.

- Time - should be asked in general terms, possibly using natural indicators (sun, etc). Asking time from destination to home is superfluous.
- Locations - Seven destinations are too many, and too subjects to local vagaries: it would be better to identify in each village, from a fixed list of destinations, the closest, the farthest and the middle one, measure their distances & times, then limit the interview to those three. That would also allow more cogent comparisons.
- Interviewees should be screened in order to gauge their familiarity with time/distance measurements. Two questionnaires should be used - the standard one, and a very simplified version.
- Re-examining the study, one comes to very similar conclusions to those of an identical study in Laos:
  - The sample size per province, and the number of provinces chosen, were too small.
  - Combined with the quantity of segmentations offered (mode of transport and destination, optionally frequency of trips, etc), this created too many subsegments that, given the sample size, could hardly have been significant.
- Thus, recommendations for future Time & Distance studies would be:
  - Sample - A larger sample size per province, so to guarantee that the theoretical sub-samples are large enough to allow for meaningful analysis
  - Locations - Instead of 3 diversified provinces, it would be better to choose pairs of provinces with similar socio-economic and infrastructural characteristics, and conduct comparative studies. That would also allow a more homogeneous sample, yielding statistically sounder results.
  - Questionnaire - should be simplified along the lines described previously and a section could be introduced, probing the interviewees' perceptions of distance, both with practical examples (and tests), and in the abstract.
  - Timing / Frequency - The study could be planned along the lines of a baseline survey, designed to be repeated at fixed intervals.

INDOCHINA RESEARCH

ANNEX I

Request for Proposal and ToR

INDOCHINA RESEARCH

ANNEX I

Our ref: SEACAP 022/003

Date: 24 February 2006

Indochina Research (Vietnam) Ltd
Vietnam
For the attention of Tim Smyth, Managing Director

Letter of Invitation

Crown Agents for Oversea Governments and Administrations Ltd (the "Contracting Agent"), acting for and on behalf of their Principal, the Department for International Development (DFID) invites you to submit proposals to provide research into "Time and Distance study in Viet Nam, Cambodia and Laos PDR" under the South East Asia Community Access Programme (SEACAP).

The following organisations have been invited to tender for the assignment in Cambodia:

- I.T Transport Limited
- Intech Cambodia
- Roughton International
- Scott Wilson
- Indochina Research (Vietnam) Ltd

With this letter is enclosed the full Request for Proposals (RFP), including the Terms of Reference (ToR) for the assignment. Requirements for proposal preparation and submission are set out in the RFP. Please note that the legally binding Request for Proposal and Contract documents are the English versions, the Vietnamese versions of the RFP and Contract are for information only.

We encourage bidder companies to cooperate/associate with local consultants to fulfill the tasks as specified in the ToR. Additionally, DFID wishes to encourage knowledge transfer to local consultants. Where appropriate, bidders should indicate how they will achieve these aims.

You are requested to confirm in writing by no later than on 2 March 2006 your intention to submit technical and financial proposals to undertake this assignment by the specified date and in accordance with the instructions contained in the enclosed Request for Proposals.

Yours sincerely,

Colin Choles
Contracting Officer
Project Management Organization

INDOCHINA RESEARCH

ANNEX I

Time and Distance study in Cambodia

Request for Proposals

Project Reference: SEACAP 022/003

24 February 2006

INDOCHINA RESEARCH

ANNEX I

Section	Contents
A	*INTRODUCTION*
B	*PROPOSAL REQUIREMENTS*
C	*FORM OF CONTRACT*
D	*EVALUATION CRITERIA*
(1)	*APPENDIX A Terms of Reference*

A INTRODUCTION

1.1 This tender process forms part of the support being provided by the United Kingdom Department for International Development (DFID) under the South East Asia Community Access Programme (SEACAP), which is a poverty targeted transport initiative centred on Vietnam, Cambodia and Laos PDR.

1.2 The Client has appointed the Crown Agents (the "Contracting Agent") to act as the Client's procurement and contracting agent with respect to research projects to be funded by the Client under SEACAP. David Salter (the "Technical Agent") has been appointed to act as the Client's agent to monitor and manage the technical aspects of each SEACAP research project.

1.3 Under SEACAP, Consultants are now sought to provide research into Time and Distance study in Viet Nam, Cambodia and Laos PDR. This RFP is to seek your proposals to provide such assistance. Full details of the assignment are provided in the Terms of Reference (ToR) at Appendix A.

1.4 If your organisation is selected as the preferred supplier of the assistance specified in the appended Terms of Reference, the contract governing such work will:

- be governed by and construed in accordance with English law and will be written in the English language;
- state the period during which the defined work is to be performed, with key milestones;
- nominate specific personnel and fee rates;
- include the original Terms of Reference, modified to incorporate any agreed revisions;
- detail reporting requirements; and
- name the Contract and Technical Officers for the assignment.

1.5 Following contract award, all reports and substantive project outputs should be prepared in English, with executive summaries also provided in English.

B PROPOSAL REQUIREMENTS

1.1 The Terms of Reference at Appendix A detail the work and outputs required from Consultants.

1.2 Consultants are required to submit proposals to undertake this assignment, as follows:
(i) Technical offer as a response to the Terms of Reference at Appendix A
(ii) Financial offer in British pounds sterling, using the format at Appendix C

1.3 These proposals should be submitted in both hard copy and electronic format by no later than 10 March 2006 to:
Crown Agents
Unit 605, North Star Building
4 Da Tuong, Hoan Kiem
Ha Noi, Viet Nam

For the attention of Le Minh Nguyet (Ms)
Please clearly mark your proposal with the reference SEACAP 022/003 (Cambodia)

1.4 Technical and financial proposals should be separately bound and should be submitted in two separate sealed envelopes, clearly marked with the project title, project reference number, name of bidding organisation and either "Technical Proposal" or "Financial Proposal". Three hard copies of each proposal are required.

1.5 All proposals should be submitted in English.

1.6 Any requests for clarification from bidders should be submitted in writing (by email or fax) in English to:

Crown Agents
Unit 605, North Star Building
4 Da Tuong, Hoan Kiem
Ha Noi, Viet Nam

For the attention of Le Minh Nguyet (Ms)
Telephone: + 84 4 9 423 509
Fax: + 84 4 9 423 506
Email seacap@crownagents.com.vn

Note: Bidders should not approach any other parties (including DFID and recipient Regional Governments) during the tender period. Only requests for clarification submitted in writing to the Contracting Agent will be responded to.

1.7 Such requests should be submitted to the Contracting Agent by no later than 5 days before the tender closing date (given under paragraph 1.3)**.** Clarifications will then be sent promptly to all confirmed bidders, revealing both the question and the response but not the name of the bidder sending the request for clarification. All requests for clarification should be submitted in English.

1.8 When preparing proposals to undertake this assignment, bidders should take note of the Evaluation Criteria set out in Section D of this Request for Proposals dossier.

The Contracting Agent reserves the right to terminate the tender procedure and not to proceed with the appointment of Consultants for the assignment.

Section C – Form of Contract
SOUTH EAST ASIA COMMUNITY ACCESS PROGRAMME (SEACAP)

CONTRACT FOR CONSULTANCY SERVICES

CONTRACT FOR: Time and Distance Study in Cambodia

CONTRACT REFERENCE: SEACAP 022/003/001

THIS CONTRACT is made

BETWEEN: Crown Agents for Oversea Governments and Administrations Ltd (the "Contracting Agent") as agent acting for and on behalf of their Principal, the Secretary of State for International Development at the Department for International Development, Abercrombie House, Eaglesham Road, East Kilbride, Glasgow G75 8EA ("the Client");

AND **:** ***[name of consultancy firm]*** (the "Consultant")

(together "the Parties").

WHEREAS:

A. The Client has committed to fund the South East Asia Community Programme (SEACAP), a poverty targeted transport initiative centred on Vietnam, Cambodia and Laos PDR, comprising a series of research projects.

B. The Client has appointed the Contracting Agent, to act as the Client's procurement and contracting agent with respect to research projects to be funded by the Client under SEACAP. David Salter (the "Technical Agent") has been appointed as the Client's agent to monitor and manage the technical aspects of each SEACAP research project.

C. Under SEACAP, the Client requires the Consultant to provide the services as defined in Appendix A ("the Services") to the Governments of Viet Nam, Cambodia and Laos PDR ("the Recipient"); and

The Consultant has agreed to provide the Services on the terms and conditions set out in this Contract.

IT IS HEREBY AGREED as follows:-

1. Documents

This Contract shall be comprised of the following documents:-

Section 1	Form of Contract
Section 2	General Conditions
Appendix A	Terms of Reference
Appendix B	Special Conditions
Appendix C	Schedule of Prices

This Contract constitutes the entire agreement between the Parties in respect of the Consultants obligations and supersedes all previous communications between the Parties, other than as expressly provided for in Appendix A and/or Appendix B.

2. Rights and Obligations

The mutual rights and obligations of the Client and the Consultant shall be as set forth in the Contract, in particular:

(a) **the Consultants shall carry out the Services in accordance with the provisions of the contract; and**

(b) **the Client shall make payments to the Consultants in accordance with the provisions of the Contract.**

3. Time of the Essence

Time shall be of the essence as regards the performance by the Consultant of its obligations under this Contract

4. Financial Limit

Payments under this Contract shall not, in any circumstances, exceed **[GBP……..]** ("the Financial Limit").

For and on behalf of	Name:	Colin Choles
The Crown Agents	**Position:**	**Contract Officer**
	Signature:	
	Date:	
For and on behalf of ***[name of firm]***	Name:	
	Position:	

Signature: Date:

SECTION 2 - GENERAL CONDITIONS

CONTENTS

DEFINITIONS AND INTERPRETATION

1. Definitions

"the Consultant" means the person(s), partnership(s) or company(ies) with whom this Contract is placed.

"the Consultant's Personnel" means any person instructed pursuant to this Contract to undertake any of the Consultant's obligations under this Contract, including the Consultant's employees, agents and sub-contractors.

"the Financial Limit" means the amount specified in Section 1 and is the maximum amount payable by the Client under this Contract.

"the Services" means the services set out in the Terms of Reference (Appendix A).

"the Technical Officer" means the person named in Appendix B who is responsible for monitoring and issuing instructions in connection with the technical aspects of the Contract.

"the Contract Officer" means the person named in Appendix B who is responsible for all contractual aspects of the Contract.

2. Interpretation

2.1 In the event of any inconsistency between these General Conditions and the Special Conditions (Appendix B), the Special Conditions shall prevail.

2.2 Except as expressly provided in Clause 14 the Consultant is not the agent of the Client or of the Contracting Agent or the Technical Agent and has no authority to represent and shall not purport to represent or enter into any commitments on behalf of the Client, the Contracting Agent or the Technical Agent in any respect.

2.3 Nothing in this Contract is intended to make nor shall it make the Client, the Contracting Agent or the Technical Agent the employer of the Consultant or any of the Consultant's Personnel.

2.4 All communications by the Consultant in relation to this contract, including, but not limited to those relating to notifications or applications for consents or instructions must be addressed to the Contract Officer.

B. OBLIGATIONS OF THE CONSULTANT

3. Obligations

3.1 The Consultant shall perform all its obligations under this Contract (including the provision of the Services) with all necessary skill, diligence, efficiency and economy to satisfy generally accepted professional standards expected from experts.

3.2 If the Consultant is a joint venture then each of the joint venture parties shall have joint and several liability in respect of the Consultant's obligations under this Contract.

4. Personnel

4.1 All members of the Consultant's Personnel shall be appropriately qualified, experienced and in a suitable physical condition so as to ensure that the Consultant complies with all the Consultant's obligations under this Contract.

4.2 No changes or substitutions may be made to members of the Consultant's Personnel identified as key personnel in Appendix B of this Contract without the Client's prior written consent.

4.3 If the Client considers any member of the Consultant's Personnel unsuitable, the Consultant shall substitute such member as quickly as reasonably possible without direct or indirect charge to the Client with a replacement acceptable to the Client

4.4 The Consultant is responsible for all acts and omissions of the Consultant's Personnel and for the health, safety and security of such persons and their property.

5. Sub contractors

5.1 The Consultant shall not sub-contract any of its obligations under this Contract without the prior written consent of the Client

5.2 If, having obtained the Client's consent, the Consultant sub-contracts any of its obligations, the sub-contract shall:-

a) provide that payments due to the sub-contractor shall be made not more than 30 days after provision to the Consultant of a valid invoice; and

b) include rights for the Consultant and obligations on the sub-contractor to ensure that the Client's rights to require replacement of personnel (as set out in Clause 4.3) and the Client's rights and the Consultant's obligations as set out in Clauses 6 to 11 (inclusive) can be enforced against the sub-contractor.

6. Disclosure of Information

6.1 The Consultant and the Consultant's Personnel shall not, without the prior written consent of the Client, disclose to any third party any confidential information obtained during or arising from this Contract (other than in the proper performance of this Contract or as may be required by authority of competent jurisdiction). In addition, no publicity is to be given to this contract without the prior written consent of the Client.

7. **Intellectual Property Rights**

7.1 All intellectual property rights in all material (including but not limited to reports, data, designs whether or not electronically stored) produced by the Consultant or the Consultant's Personnel pursuant to the performance of the Services ("the Material") shall be the property of the Consultant.

7.2 The Consultant hereby grants to the Client a world-wide, non-exclusive, irrevocable, royalty-free license to use all the Material.

7.3 For the purpose of Clause 7.2, "use" shall mean, without limitation, the reproduction, publication and sub-license of all the Material and the intellectual property rights therein, including the reproduction and sale of the Material and products incorporating the same for use by any person or for sale or other dealing anywhere in the world.

8. Official Secrets Acts

8.1 The Consultant shall ensure that all members of the Consultant's Personnel are aware that the Official Secrets Acts 1911 to 1989 apply to them.

9. Access and Audit

The Consultant shall keep accurate and systematic accounts, files and records ("the Records"). The Records shall clearly identify, among other things, the basis upon which invoices have been calculated and the Consultant shall keep the Records throughout the duration of this Contract and for six years following its termination.

9.1 The Consultant shall upon request provide the Client or its representatives (including the Contracting Agent and the Technical Agent) unrestricted access to the Records in order that the Records may be inspected and copied. The Consultant shall co-operate fully in providing to the Client or its representatives,

including the Contracting Agent and the Technical Agent, answers to such enquiries as may be made about the Records.

9.2 Where it is found by the Client that any overpayment has been made to the Consultant the Consultant shall reimburse the Client such amount within 28 days of the date of written demand from the Contracting Agent.

10. Corruption, Commission and Discounts

10.1 The Consultant warrants and represents to the Client that neither the Consultant nor any of the Consultant's Personnel:

(a) has given, offered or agreed to give or accepted, any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of any contract or for showing or forbearing to show favor or disfavor to any person or entity in relation to any contract; or

(b) has entered into any contract in connection with which commission has been paid or agreed to be paid by or to the Consultant or Consultant's Personnel or on their behalf or to their knowledge unless, before such contract was made, particulars of any such commission and of the terms of any agreement for the payment of such commission were disclosed in writing to the Client, whose written consent was subsequently given to such payment.

10.2 Neither the Consultant nor any of the Consultant's Personnel shall accept for or on their own benefit any trade commission, discount or similar payment or benefit in connection with this Contract.

11. Conflict of Interest

11.1 Neither the Consultant nor any of the Consultant's Personnel shall engage in any personal, business or professional activity which conflicts or could conflict with any of their obligations in relation to this Contract.

11.2 The Consultant and the Consultant's Personnel shall notify the Client immediately of any actual or potential conflict together with recommendations as to how the conflict can be avoided.

12. Insurances

12.1 The Consultant shall maintain professional indemnity insurance cover of an amount not less than the Financial Limit unless otherwise provided in Appendix B.

13. Indemnity

13.1 Except where arising from the negligence of the Client or the Client's employees, the Consultant shall indemnify the Client and each of the Contracting Agent and the Technical Agent, as applicable, in respect of any costs or damages howsoever arising out of or related to breach of warranty or representation, contract or statutory duty, or tortious acts or omissions by the Consultant or the Consultant's personnel or agents (including any claims made against the Client, the Contracting Agent or the Technical Agent) by third parties in respect thereof.

PRICE AND PAYMENT

14. Applicable Provisions and Financial Limit

14.1 Unless different provisions are substituted in Appendix B, Clauses 14 to 18 inclusive shall apply in relation to price and payment.

14.2 The components which comprise the Financial Limit are set out in the Schedule of Prices, Appendix C. No expenditure may be incurred in excess of the Financial Limit and no virements between components shown in the schedule of prices in Appendix C are permitted without the prior written authority of the Contracting Agent.

15. Remuneration

15.1 The basis for remuneration of the consultant shall be as specified in Appendix B.

15.2 Any fees payable are deemed to cover the cost of salary, overseas inducements, leave allowances, bonuses, profit, taxes, insurances, superannuation, non-working days and all other costs including, but not limited to, clothing, passports, visas and vaccinations, overheads and expenses of whatsoever nature that may be incurred except those otherwise specifically provided for in this Contract.

15.3 If the amount to be paid to the Consultant by way of remuneration for the completion of the Consultant's obligations under this Contract has been fixed at the time of signature of this Contract the amount shall be as provided for in Appendix C. Payments of the fixed remuneration shall be made on a 'Milestone Payment Basis' [unless otherwise provided in Appendix C].

15.4 Where the applicable payment mechanism is "Milestone Payment", invoices shall be submitted for the amounts indicated in Appendix C as and when the relevant milestone is achieved in its final form by the Consultant or following completion of the Services, as the case may be, indicating both the amount or amounts due at the time and cumulatively.

15.5 Payments pursuant to Clause 15.4 are subject to the satisfaction of the Technical Officer in relation to the performance by the Consultant of its obligations under the Contract and to verification by the Technical Officer that all prior payments made to the Consultant under this Contract were properly due.

16. Reimbursable Expenses

16.1 The nature and maximum amount of any reimbursable expenditure which the Consultants may claim in respect of the performance of the Services are defined at Appendix C and such expenses shall be recoverable at cost from the Client, subject to the following:

(a) All travel will be reimbursed at the cost of Economy Class unless the Client provides written approval in advance for fares in any other class.

(b) Subsistence is payable only for each night actually spent away from home where the services are being undertaken. Subsistence is not payable for leave periods other than public holidays spent near the site of work.

16.2 Unless the client provides contrary exemption to the Consultants in advance and in writing, the Consultants will be eligible to reclaim from the Client VAT in respect of reimbursable expenses. This will apply only to expenditure on items legitimately attracting VAT. Where the Consultants or their agents have paid VAT at point of sale, no additional VAT will be reclaimable from the Client by the Consultants.

17. Invoicing Instructions

17.1 Invoices should be submitted in arrears in duplicate to the Contracting Agent and in accordance with the remainder of clause 17.

17.2 In all cases, invoices shall be accompanied by a certificate signed by the Technical Officer confirming the satisfactory performance by the Consultant of the Contract and that all prior payments made to the Consultant under this Contract were properly due, in a form to be agreed between the Consultant and the Contracting Agent.

17.3 The Client shall, unless otherwise expressly provided in Appendix B, make payments due by direct credit through the UK Bank Clearing Systems (BACS) or by international bank transfer (SWIFT). All invoices must contain details of the bank account to which payments are to be made.

17.4 Invoices must bear this Contract reference, be numbered sequentially and dated, and marked "For the attention of [the Contracts Officer]". The final invoice presented in connection with this Contract should be endorsed “Final Invoice”.

17.5 Unless this Contract is on a milestone payment basis, all invoices should contain details of expenditure in accordance with Appendix C of this Contract.

17.6 The Contracting Agent may request proof of payment in respect of any item and the Client shall be entitled to refuse to meet a claim if this cannot be provided.

17.7 Any invoice not presented in accordance with the above may be rejected and in any event shall be liable to query and delay in payment. The Client reserves the right not to pay any amount due in respect of an invoice received by the Contracting Agent more than 90 days after the day of the Consultant becoming entitled to invoice for the payment to which it relates.

18. Payments

18.1 Subject to the Client being satisfied that the Consultant is or has been carrying out their duties, obligations and responsibilities under this Contract, sums duly approved shall be paid within 30 days of receipt of a valid invoice, with corresponding certificate signed by the Technical Officer.

18.2 Payment shall be made in sterling. Reimbursable expenditure (if any) arising in foreign currency shall be reimbursed at the exchange rate stated in the London

Financial Times “Guide to World Currencies” on the Friday immediately preceding the date on which the purchase was made or services acquired by the Consultant or, if this took place on a Friday, at the rate so stated on that day.

18.3 If for any reason performance of this Contract is not considered to be satisfactory, an appropriate sum may be withheld from any payment otherwise due. In such event the Client shall identify the particular Services which are not satisfactory together with the reasons for such dissatisfaction, and payment of the amount outstanding will be made upon remedy of any unsatisfactory work or resolution of outstanding queries.

18.4 Should the Client determine after paying for a particular service that the service has not been completed satisfactorily, the Client may recover, or withhold from further payments, an amount not exceeding that previously charged for that service until the unsatisfactory service is remedied to its satisfaction.

FORCE MAJEURE AND TERMINATION

19. Force Majeure

19.1 Where the performance by the Consultant of its obligations under this Contract is delayed, hindered or prevented by an event or events beyond the reasonable control of the Consultant and against which an experienced consultant could not reasonably have been expected to take precautions, the Consultant shall promptly notify the Client in writing, specifying the nature of the force majeure event and stating the anticipated delay in the performance of this Contract.

19.2 From the date of receipt of notice given in accordance with Clause 19.1, the Client may, at its sole discretion, either suspend this Contract for up to a period of 6 months ("the Suspension Period") or terminate this Contract forthwith.

19.3 If by the end of the Suspension Period the parties have not agreed a further period of suspension or re-instatement of the Contract, this Contract shall terminate automatically.

20 Suspension or Termination without Default of the Consultant

20.1 The Client may, at its sole discretion, suspend or terminate this Contract at any time by so notifying the Consultant and giving the reason(s) for such suspension or termination.

20.2 Where this Contract has been suspended or terminated pursuant to Clause 19.1, the Consultant shall:

(a) take such steps as are necessary to terminate the provision of the Services, (including suspending or terminating any Sub-Contracts) in a cost-effective, timely and orderly manner; and

(b) provide to the Client, not more than 60 days after the Client notifies the Consultant of the suspension or termination of this Contract an account in writing, stating:

(i) the fees and expenses, if any, due before the date of suspension or termination;

(ii) any costs to be expended after the date of suspension or termination which the Consultant necessarily incurred in the proper performance of this Contract and which it cannot reasonably be expected to avoid or recover.

20.3 Subject to the Client's approval the Client shall pay such amount to the Consultant within 30 days after receipt by the Contract Officer from the Consultant of an Invoice in respect of the amount due.

21. Suspension or Termination with Default of the Consultant

21.1 The Client may notify the Consultant of the suspension or termination of this Contract where the Services or any part of them are not provided to the satisfaction of the Client giving the reasons for such dissatisfaction and, in the case of suspension, the action required by the Consultant to remedy that dissatisfaction and the time within which it must be completed.

21.2 Where this Contract is suspended in accordance with Clause 21.1 and the Consultant subsequently fails to remedy the position to the Client's satisfaction the Client may terminate this Contract forthwith.

21.3 The Client may, without prejudice to its other rights, including but not limited to the right to claim for costs and losses incurred, terminate this Contract forthwith where:

(a) the Consultant or any member of the Consultant's Personnel, either directly or through their servants or agents, breaches any of their obligations under this Contract; or

(b) the Consultant or any member of the Consultant's Personnel has committed an offence under the Prevention of Corruption Acts 1889 to 1916 or the Anti-Terrorism Crime and Security Act 2001 or in breach of Clause 10 of this Contract; or

(c) the Consultant is an individual or a partnership and at any time:

(i) becomes bankrupt; or

(ii) is the subject of a receiving order or administration order; or

(iii) makes any composition or arrangement with or for the benefit of the Consultant's creditors; or

(iv) makes any conveyance or assignment for the benefit of the Consultant's creditors; or

(d) the Consultant is a company and:

(i) an order is made or a resolution is passed for the winding up of the Consultant; or

(ii) a receiver or administrator is appointed in respect of the whole or any part of the undertaking of the Consultant.

(e) the Consultant is a partnership or a company and there is a Change in Control. "Change in Control" means that the person(s) (including corporate bodies) directly or indirectly in Control of the Consultant at the time this Contract is entered into cease to be in Control. "Control" means the power of a person to secure that the affairs of the Consultant are conducted in accordance with the wishes of that person.

21.4 Where this Contract is terminated in accordance with this Clause, the Consultant shall without prejudice to the Client's other remedies, take any steps necessary to terminate the provision of the Services in a timely and orderly manner but shall not be entitled to any further payment in relation to this Contract.

21.5 Where this Contract is terminated pursuant to Clause 21.3(b) the Consultant shall pay the Client within 10 days of notification such amount as the Client shall have determined as the amount of any loss to the Client resulting from such termination together with the amount or value of any gift, consideration or commission concerned.

GENERAL PROVISIONS

22. Variations

22.1 No variation in the terms or scope of this Contract shall be effective without the Client's prior written consent and recorded in writing. The Client, the Contracting Agent and the Technical Agent shall not have any liability in respect of work performed outside the Services set out in Appendix A.

23. Assignment

23.1 The Consultant shall not, without the prior written consent of the Client, assign or transfer or cause to be assigned or transferred, whether actually or as the result of takeover, merger or other change of identity or character of the Consultants, any of its rights or obligations under this Contract or any part, share or interest therein.

24. Limit of Liability

24.1 Except where there has been misconduct, gross negligence, dishonesty or fraud on behalf of the Consultant or the Consultant's Personnel the Consultant's liability under this Contract shall be limited to the amount of the Financial Limit unless otherwise provided for in Appendix B.

25. Retention of Rights

25.1 Clauses 6, 7, 8, 9, 13, 26 and 27 of this Section 2 and any relevant clauses listed under Appendix B shall continue in force following the termination of this Contract.

26. Law and Jurisdiction

26.1 This Contract shall be governed by the laws of England and Wales.

27. Amicable Settlement

27.1 The parties will attempt in good faith to negotiate a settlement to any claim or dispute between them arising out of or in connection with this Contract. If the matter is not resolved by negotiation the parties will refer the dispute to mediation in accordance with CEDR (Centre for Dispute Resolution in London, UK) procedures. If the parties fail to agree terms of settlement within 90 days of the

initiation of the procedure the dispute may be referred to an arbitrator as agreed between the parties or failing such agreement as may be nominated by the President of the Law Society of England and Wales upon application of any party. The initiation of the procedure is defined as the written request to CEDR by any party for a mediation provided that such request is copied to the other party(ies).

27.2 The decision of the arbitrator shall be final and binding on both parties.

27.3 The place of arbitration shall be London.

Appendix A

Terms of Reference

II. 1. Brief Description

The South East Asia Community Access Programme – SEACAP, is a DFID (Department of International Development – UK based), funded programme the goals of which are

1. To help and support developing countries make the optimal decisions on providing rural access to remote poor communities
2. To improve sustainability and affordability of rural access to poor countries
3. Create opportunities for pro-poor growth and poverty alleviation.

These Terms of Reference (ToR) describe the work required to undertake data collection – on behalf of the World Bank, from household surveys in 9 individual provinces of Viet Nam, Cambodia and Laos PDR (3 in each Country) relating to the time and distance travelled.

The work will be primarily aimed at improving the quality of statistics as a priority for various international development initiatives - including the World Bank's results based agenda which is concerned with national and global data challenges and has highlighted the need for improved statistics to better measure development outcomes.

The outputs of the individual country studies are for:

- World Bank Transport Technical Paper – the results are intended to be used to develop a guidance note on the relative and absolute reliability and accuracy issue of time and distance reports (see appendix A).

The primary purpose is to improve the quality of data collected through household surveys as they relate to time and distance travelled.

2. Background

Timely and reliable information is not just a concern of the international community - it is also needed by governments, businesses, other organizations and individuals to make informed decisions.

As development strategies have focused on poverty and on the well-being of the most vulnerable segments of society, the need for household-based economic and social data has grown. Surveys of households and individuals are an effective way to obtain this information. Combined with other sources of information, household survey data can be particularly important in better tailoring transport programmes and policies to the needs of the poor by further understanding their travel behaviour and patterns in relation to choice,

location, and scheduling of daily activities. Travel time savings are a major benefit resulting from investments in transport and are of particular importance in this regard.

Establishing the headline Rural Access indicator[1], which measures access on the basis of times and distances as reported by survey respondents, has revived concern about the quality of these time and distance reports. In general, data on travel time (t) and distance (d) is collected through face-to-face interviews of members of randomly selected households. Thus what is reported is not objective, but the perceptions of the respondents based on their own awareness and experience. Usually we do not know the exact distance travelled, nor do we know the actual time taken to travel that distance. It is suspected that estimates of time and distance are likely to be distorted. The problem could be complicated by several measurement related challenges:

(1) *Recall problem*: Cognitive research indicates that, in recalling information, respondents tend to balance (perceived) effort and their likely accuracy in recalling information. Accessibility depends on the saliency of the event being studied. The concept of 'salience' relates to the fact that the more important and memorable an event is to an individual, the easier it is to remember it accurately[2]. Thus, it is highly likely that respondents might underreport the habitual event because they are harder to recall[3]. Besides, respondents who might have used a particular route or routes, less frequently or in the distant past will have recall problems.

(2) *Unfamiliarity with measurement units:* In rural communities of developing countries, where time measurement devices are not commonly used, respondents are unable to estimate time in an accurate manner. Just as with time, large portion of rural residents are not familiar with units (kilometres or miles) to measure distance. A recently conducted study on household travel in Cambodia concludes, "*respondents found it difficult to estimate time and distance. Villagers measured the length of their trips by changes in the position of the sun or by time taken to smoke a cigarette"* (Rozemuller et al. 2000, p.7).

(3) *Rounding up*: There is tendency of respondents to round up minutes to higher values, by at least 5 minutes or more so that the time taken appears longer.

[1] 'Rural Access Indicator' measures the number of rural people who live within 2 km (typically equivalent to a walk of 20 minutes) of an all-season road as a proportion of the total rural population. An "all-season road" is a road that is motorable all year round by the prevailing means of rural transport

[2] The opposite is also true – the less important and the more trivial an event is to an individual, the more likely it is to be forgotten, or inaccurately recalled.

[3] It is also likely that the salient events will override the habitual events in the respondents' memories.

(4) *Variation in terrain*: The terrain plays a considerable role as well, with more time taken to travel the same distance in hilly areas than on the plains, which is not easily captured in the estimates by respondents.

(5) *Variation in personal characteristics*: Time taken to travel the same distance can be expected to vary with the personal characteristics of respondents; such as gender and age. Perceptions of time and distance may also vary with those characteristics.

(6) *Variation by transport mode*: Time taken to travel the same distance varies by transportation mode.

A pilot household survey was undertaken between May and July 2004 in Albania. Pedometers were used to measure actual distance and time walked by respondents. Altogether 250 respondents—varying in age and gender — measured the actual distances and time required to travel from their dwellings to school and work. These measurements were then compared against the time and distance estimated by these respondents to travel the same route. Preliminary analysis of the Albanian survey results shows that estimated time and distance have high correlations with the actual time and distance measurements respectively. However, it also confirmed some of the concerns indicated above. (Refer to Appendix B for an example of the questionnaire to be completed).

For other forms of survey it may be more appropriate to use a measuring wheel and stopwatch, but which ever form of recording is used it is anticipated that appropriate training to respondent will need to be given.

3. Output

Encouraged by the findings of the Albanian data, it is now proposed that this survey is repeated in diverse settings before developing the technical guidance note. In doing so we are keen to carry out this survey for respondents travelling for other purposes as well as to work and school, in areas where the perception of time and distance in the 'modern' system is poorer and where there is a variation in travel routes in terms of terrains.

Verification surveys:

1) Verification household surveys will be conducted in Viet Nam, Cambodia and Laos PDR in order to collect measurements of the actual travel time and distance for

comparison with those reported by household members. At least 500 households should be surveyed in each Country.

2) Surveys will be undertaken in differing areas of terrain including mountainous, delta and plain as appropriate for each individual country and will comprise 2 different communes/villages in each Province. At least 200 household should be surveyed in each type of terrain.
3) Wherever possible households should be selected from an existing representative sampling framework.

Examples of core questions to be asked respondents are:

(a) how far do you live from facility [estimated in 'kilometres' to the nearest first decimal i.e. 100metres];
(b) how long does it take you to go to facility [estimated in 'minutes' to the nearest 5 minutes or better];
(c) How often do you go to facility [reported as x times per week, or longer].
(d) Form of transport – [reported as walking, cycle, by motorized transport etc]

In addition the time and distance will be measured with adequate precision. Respondents will require appropriate and adequate training in the measures to be adopted to record time and distance.

The Consultant will:

1. Produce an Inception Report of not more than 10 pages within two weeks of award of the Contract, which will cover **the requested Country – Cambodia**. The Inception report will include details of the measures/procedures to be adopted to verify the accuracy of respondents' answers to detailed questions.
2. The consultant should ensure that all relevant Government and donor agencies are aware and 'buy in' to the programme. Particularly close liaison with the World Bank office in each Country is of primary importance.
3. The consultant should ensure that all the relevant Government and donor agencies are aware and 'buy in' to this programme. Particularly close liaison with the WB office in each separate country is of primary importance.
4. The Consultant will produce a detailed list of questions to be asked to individual respondents prior to commencing the study.
5. The Consultant will produce a detailed report **of the requested Country – Cambodia** at the completion of the Verification studies.
6. The Consultant will include in the final report a detailed list of appropriate organizations, publications and web-sites where the results of the study may be made available to a wider audience.
7. Hold a half day seminar at the World Bank headquarters – if appropriate, in each individual Country covered by the study. The seminars will include a power point

presentation providing an overview of the technical guidance note as well as the results of the reports.

4. Dissemination

The Consultant shall be responsible for producing the reports in English and the National language of the Country in which the study took place.

Electronic copies of the reports shall be placed on the World Bank's Transport intranet and internet websites (under the topic "results measurement"). Hard copies or other formats may be distributed widely within and outside the World Bank and DFID.

Electronic copies of the reports shall also be placed on the Transport Knowledge Partnership web-site.

A half day seminar shall be held in each Country covered by the study and key stakeholders invited from national governments and development agencies – including ADB, EU and bilateral organisations.

5. Expertise and Timing

The Consultants team is expected to have experience in the following areas:

1. Good working Knowledge of South East Asia, especially in Cambodia
2. Experience in conducting similar household based studies.
3. Experience of the rural transport sector.
4. Experience in synthesizing the knowledge gained into concise reports and presentations.

The Consultant's team shall include members who have good national and international experience of each individual country covered by the study. The Client welcomes the use of local sub-consultants.

Anticipated Time schedule

Tender Invite	24 February 2006
Tender Return	10 February 2006
Contract Award	17 March 2006
Project start	24 March 2006

6. Proposals

The Proposals should address the following issues and be as concise as possible:

1. A detailed work programme and plan and activities including the proposed start date, which should ensure completion by the end of 24 June 2006.
2. A detailed budget including daily rates, number of Days and reimbursable costs. These should be based on existing DFID rates and for National Consultants EU cost norms.
3. A detailed budget for each individual seminar.
4. Provide details of stakeholders, donors and National Government Departments to be approached to gain permission to undertake surveys.
5. Joint proposals which combine skills and organizations and disciplines are encouraged.
6. CV's of all proposed team members should be included as part of the proposal
7. Details of any proposed sub-consultants should be provided for approval by DFID/WB/ relevant government agency in each country.
8. The overall team make up and management arrangements. Please note that DFID will expect the lead Consultants to be responsible for the financial and administrative arrangements for the whole team.

7. Milestones

1. Payment will be made on the completion of the individual studies and acceptance of the final report.

Holding of individual seminars.

Annex A1

TECHNICAL GUIDANCE NOTE

The results from the individual studies are intended to be used by the World Bank to develop a guidance note on the relative and absolute reliability and accuracy issue of *time* and *distance* reports. The note will be a practical tool for designing surveys which are to include relevant and effective questions on travel time and distance. The guidance note will help to answer the important concerns about the time and distance estimates made by respondents:

1. How reliable are reported distances as proxies of actual distances?
2. How reliable are reported times as proxies of actual times?
3. How can travel times be explained by travel distances?
4. What impacts do personal characteristics of commuters have an on reported and actual travel times?

5. Which measure, time or distance, is recommended as probably more reliable and relevant under particular circumstances – and why?
6. How should time and/or distance questions be best phrased in each of the survey Countries?

Appendix B

SPECIAL CONDITIONS

1. Officials

1.1 The Contract Agent is:

Crown Agents
St Nicholas House
St Nicholas Road
Sutton
Surrey SM1 1EL
United Kingdom
Telephone: + 44 (0) 20 8643 3311
Fax: + 44 (0) 20 8643 4502
Email oscar.cardozo@crownagents.co.uk

Contracting Officer: Oscar Cardozo

For any information relating to the contract including invoicing, please contact:

Crown Agents
Unit 605
North Star Building
4 Da Tuong
Hoan Kiem
Viet Nam
Telephone: + 84 4 9 423 509
Fax: + 84 4 9 423 506
Email seacap@crownagents.com.vn

Project Manager: Ms Le Minh Nguyet

1.2 The Technical Agent is:

Mr David Salter
C/o Ministry of Rural Development
Corner of St. 169 and Russian Blvd.,
Phnom Penh, Cambodia
Telephone: + 855 012 188 6474
Email davidsalter@online.com.kh

1. Reports

1.1 The Consultant is required to submit project reports to the Contracting Agent **[TBC]** at the address shown in Clause 1.1 of Appendix B in accordance with the Terms of Reference at Appendix A.

1.2 The Consultant is required to submit Milestone reports to the Technical Agent **[TBC]** at the address shown in Clause 1.1 of Appendix B in accordance with the Terms of Reference at Appendix A.

2. Key Personnel

3. Sub-Contractors

4. Medical Insurance

The Consultant is responsible for ensuring adequate and appropriate medical insurance cover before beginning work overseas under the Contract. The Consultant's fee is deemed to include an element to cover the cost of medical insurance.

Appendix C

SCHEDULE OF PRICES

Fixed Payments

The amount to be paid for the completion of the services is fixed at GBP].

Payment will be made on satisfactory performance of the services, at the payment points defined below (schedule of payments):

Schedule of Payments**:**

Criteria for Payment	Amount of Payment	VAT if applicable
25% of fees payable on acceptance of Inception Report.	£[ ]	
25% of fees payable on submission of reports for each country upon completion of verification studies.	£[ ]	
25% of fees payable on acceptance of final Report	£[ ]	
25% of fees payable on holding of individual seminars	£[ ]	
TOTAL:		

D EVALUATION CRITERIA

1.1 Selection of Consultants by the Contracting Agent will be on the basis of a combination of the technical and financial scores achieved, calculated as follows:

Technical Points Score: maximum 80 points (pass mark 60 points)

I	Understanding of the requirement	10
II	Approach, methodology and work programme	35
III	Qualifications and experience of proposed Consultants	35

Note that a technical score of 60 points will be required to ensure further consideration of the proposal.

INDOCHINA RESEARCH

ANNEX I

1.	Understanding of requirement		10
2.	Approach, methodology and work programme		35
	2.1	Approach and methodology	20
	2.2	Work programme	10
	2.3	Knowledge Transfer	5
3.	Qualification and experience of proposed Consultants		35
	3.1	Relevant qualifications (Team Leader)	5
	3.2	Relevant qualifications (Team)	5
	3.3	Experience of similar assignments (Team Leader)	10
	3.4	Experience of similar assignments (Team)	10
	3.5	Local Participation	5

Technical Points Score (S_T)

Financial Points Score: maximum 20 points

Lowest Price (P_L) = 20 points

Bid Price (P_B) = $\frac{P_L \times 20 \text{ points}}{P_B}$

Financial Points Score (S_P)

Total Score = $S_T + S_P$

INDOCHINA RESEARCH

ANNEX II

Inception Report

INDOCHINA RESEARCH

ANNEX II

SEACAP 022-003 (Cambodia)
Inception Report

Table of Contents

a)

1. Introduction to SEACAP 022-003 Cambodia

Background & Objectives

The South East Asia Community Access Programme – SEACAP - primarily aims at improving the quality of statistical data collected for travel indicators and the results will be used to develop a technical guidance note on the relative and absolute reliability and accuracy issue of time and distance reports.

Travel time and distance data collected can be influenced by factors, such as:

- Recall problems (importance of trip tends to impact on saliency of recall)
- Unfamiliarity with measurement units (type & consistency of unit of measurement)
- Rounding up of time & Distance estimates tend to exaggerate time/distance taken
- Variation in terrain (hilly .v. plain) and impact of time of year (dry / wet season)
- Variation in personal characteristics (age, gender etc..)
- Variation by transport mode (on foot, motorbike etc..)

However, previous surveys have indicated that there is a high correlation between time and distance estimated by respondents and actual time and distance covered for typical daily travel routes.

As such, SEACAP this survey will be conducted in diverse settings in Cambodia to develop technical guidance note for future use by the World Bank & SEACAP in designing surveys which are to include relevant and effective questions on travel time and distance.

As such, this survey will address the distance estimates made by respondents in terms of:

- How reliable are reported distances as proxies of actual distances?
- How reliable are reported times as proxies of actual times?
- How can travel times be explained by travel distances?
- What is the impact of personal characteristics on reported and actual travel times?
- Which measure, time or distance, is recommended as probably more reliable and relevant under particular circumstances – and why
- How should time and/or distance questions be best phrased in each survey country?

2. Description of Scope of Work & Methodologies

IRL approach to the specific tasks & scope of work required to implement and undertake this project are outlined as follows

2.1 Pre Survey Stage

2.1.1 Survey Design, Sampling Frame and Methodology

a) *Survey Province Selection*: 3 provinces are selected in order to offer coverage of the different terrain conditions of Cambodia are as follows.(See Also Annex I Sampling maps)

- Kampong Cham - Mostly flat rural province. Population 1,892,977, Households 312,841
- Kampong Speu - Agricultural/hilly terrain. Population 704,618, Households 115,728
- Mondulkiri - Mountainous, heavily wooded terrain mostly inhabited by minorities. Population 38,129, Households 5,657

b) *Survey Districts Selection*: A total sample of N=600 across all three provinces with N=200 interviews per province and N=100 per district. In order to offer the widest possible range of travelling conditions two different districts in each province are selected. These 2 types of districts will be 1 rural district near the provincial capital and 1 remote district. The profile of districts in each province is as follows:

- Kampong Cham (N=200):
  - - N=100 Kampong Siem - Near Capital (3 km) - Population 116,545, Households 18,884
  - - N=100 Memot - Remote (88 km) – Population 130,946, Households 21,775

- Kampong Speu (N=200)
  - – N=100 Samraong Tong - Near Capital (6 km) – Population 139,001, Households 22,464
  - – N=100 Aoral - Remote (52 km) – Population 18,434, Households 3,362

- Mondulkiri (N=200):
  - – N=100 Pech Chenda - Nearby Capital (30 km) – Population 6,035, Households 823
  - – N=100 Kaoh Nheaek – Remote (85 km) - Population 10,494, Household 1,525

c) *Survey Village Selection*: to ensure a comprehensive cover of different travel environments 10 villages will be selected in each of the districts specified above. Each village will be selected on the basis of the following criteria:

- 2 villages within 5 km from district center
- 2 villages within 10 km from district center
- 2 villages within 15 km from district center
- 2 villages within 20 km from district center
- 2 villages within more than 25 km from district center

d) *Survey Household Selection* – 10 households in each village will be subject to survey. To select the household a sampling interval of 5 per road segment is applied with interviewers alternating from one side of the road to another. Once the household is located, respondent selection will be based on screening criteria (see below).

e) Survey Respondent Selection: Once the respondent is selected, and passes the screening process, a face-to-face interview will be conducted. To ensure that survey results are as representative of the Cambodian population as possible and to examine the impact of personal characteristics on reported and actual travel times, respondents will be selected on the basis of the following criteria:

- Age – Aged over 13 – in the age groups 13-18,19-24,25-34,35-44, 45 +
- Gender – Both Males and Females (proportional to population)
- 1 person only per household is selected

2.1.2 Develop survey questionnaire, with detailed list of questions and translate the questionnaires and survey materials into Khmer

IRL has developed the questionnaires to be used for this study. See Annex III attached for scope & coverage of Respondent & Validation Questionnaires.

2.1.3 Train project staff (interviewers, supervisors, data entry personnel) and undertake the pre-testing of the questionnaires in pilot surveys carrying out respondent interviews and verifications surveys

a) *Survey Mobilisation & Training* – IRL will conduct a project briefing to ensure that the survey objectives, and methodologies and quality standards are fully understood by the research teams, supervisors, data processors etc who are to implement this project. All staff will undergo specific training and briefing sessions on measurement issues required.

b) Pilot Interviews – The content and form of the Respondent & Validation questionnaires will be tested by way of a "pilot" survey using the interviewing team to conduct face-to-face interviews with at least 20 randomly chosen subjects. This pilot survey ensures that the final questionnaires used in the actual survey will be as accurate and efficient as possible.

c) GPS Training – the interviewers and supervisors will be trained in semi-rural areas around Phnom Penh over three days in early June. The training will be led by 1 international GPS specialist and 1 international survey specialist and will be supported by local GPS specialists. Training will involve a combination of workshop-style presentation and discussion and as well as the practical element of pilot interviews to ensure that all interviewers are able to operate the GPS' efficiently and are able to gather the required data. Supervisors will be given additional technical training so that they are able to conduct GPS specific QA checks on the data and data downloading of GPS's data. The training schedule and contents is outlined below.

	Day 1	Day 2	Day 3
Morning	• Project background, objectives • Explain survey forms and Methodologies • Discussion	• View & Record GPS data • Maintenance, backup of GPS • Discussion	• Discuss pilot results • Supervisors training on GPS data download, Survey QA
	Lunch break	**Lunch break**	**Lunch break**
Afternoo	• Introduction to GPS • Lecture on operation • Practice GPS operation	• Conduct Pilot interviews in field (local area)	• Fine-tune procedures • Final instruction of survey procedure and review of GPS usage procedures

2.2 Survey Implementation Stage

2.2.1 Fieldwork supervision and Quality Control during fieldwork and data collection

a) Permissions – IRL will co-ordinate with commune/village chiefs to help facilitate the survey implementation, IRL requests that **SEACAP provides a letter o**f support (explaining the project in brief) to IRL so that is can be used to help this process.

b) Survey Content & Scope - Randomly selected respondent from a household will complete both the "main" interview as well as a validation survey in order to complete all information requirements of the study. Only when respondents complete both survey elements will the survey be considered as successful and it's data used in analysis & reporting. Details of each survey element are shown below:

- Time & Distance Respondent Survey – in information scope will include a list of facilities for which time & distance will be measured are those typically used by the populations and are also the focus of most development projects. These are
  - School
  - Health Center (usual one they attend)
  - Market (usual one they attend)
  - Water source (non-backyard (usual one they attend)
  - Rice cultivation area
  - Administration office (usual one they attend)

- The facilities / locations places they go to will be "regular" places of travel which is defined as a facility they travel to at least once per month as it is assumed that responses will be more reliable the more frequently they travel to those locations. The exception to this will be Administrative Offices as frequency of visit is likely to be less regular than for other facilities listed above.
- In the case of gathering time & distance data for travel to schools, either the child or the parent who regularly accompanying the child to school may respond.
- Distance will be estimated in kilometres to nearest 100metres
- Time will be estimated in hours & minutes to the nearest 5 minutes;
- Frequency of travel to each facility [x times per day, week, month].
- Forms of transport used to go to each facility and the main form of transport used to travel to each facility (walking, cycle, motorbike, tuk tuk, boat, ox cart etc..]

- Verification Survey - the actual time and distance will be measured by interviewers accompanying the respondent using GPS units to measure the actual time and distance for travel journeys described in respondent surveys. The verification survey will be implemented using the following principles:
  - Validation Survey conducted on the same day or following day as respondent survey - whatever is most convenient for respondent.
  - GPS measurement of time and distance will be conducted for each of the usual journey mentioned in the respondents survey
  - During the pilot & initial surveys the most common form of transport will be defined for each of the usual journey AND only the most common form of transport used for each of the usual journeys mentioned by respondents will be verified by GPS.
  - GPS verification of time and distance for each journey will be conducted both TO and FROM the destination – as times / distance may vary given certain terrain (ie mountainous travel is likely to be uphill and downhill) in and /or respondents estimates may vary for TO and FROM the facility.

c) Fieldwork Quality Control & Reporting – experienced supervisors traveling with survey teams will manage fieldwork activities and will carry out quality control of the survey results and will work closely with IRL management to monitor the performance of interviewers. The specific roles of the supervisors are to

- Collect the incoming completed survey forms and conduct 100% check for incomplete, omitted or otherwise erroneous data recording practices.
- Conduct random post-checking of 30% of completed respondent surveys.
- Delivery of weekly fieldwork progress reports to IRL for compilation and delivery to Crown Agents each week.

d) Technical GPS Field Support & QC Contingencies – several support and quality control elements will be implemented during the survey to ensure the most efficient data collection processes. The key steps taken will be as follows

- Data Security - GPS battery life is approximately 12 hours and team will be supplied with enough alkaline batteries to last the survey duration with some to spare. GPS units have internal memory, so no data will be lost if the batteries should go flat during a trip. The operator will simply need to change the batteries and carry on.

- Data Back Up - The most critical GPS data will also be transcribed to the paper GPS survey form (see Annex III) as the survey is conducted. Data will also be stored in the internal memory of the GPS unit and will also be subjected to the normal data security and backup procedures. Data will be downloaded to project laptops every week or at end of each fieldwork trip which ever is the most frequent. The GPS model in use (eTrex Vista) can store 1,000 points and 10,000 track points. This will be allow up to 500 individual trips to be stored on each unit, which is more than enough for each fieldwork trip.

- Operation Supervision - Supervisors traveling with the teams will monitor the operation of the GPS units, particularly to ensure that altimeter is calibrating correctly. While the units have automatic calibration, should an error be apparent, a simple manual calibration procedure will be applied. Supervisors will be trained in manual calibration during the three day training course. As if required, technical staff can be contacted by supervisors.

- Data Quality Control - Supervisors will monitor the GPS data being recorded at the end of each day. A simple checklist will be developed for the equipment and the data in each unit. Each unit is numbered so that the data source can be traced.

e) Data Collation & Analysis – the input and QC processes to be implemented will be:

- Respondent Survey Database – an SPSS database will be used for data entry and tabulation of the respondent survey. This database will contain several quality controls (logic checks, cross tabulations etc..) and 100% of data will be entered twice for each survey to ensure the most accurate data set possible is provided for analysis & reporting. All data entry for this survey will be centrally input and managed at IRL's Phnom Penh office by experienced data entry staff.

- Post-trip GPS Data download & QC - At the end of each fieldwork trip, the GPS units data will be downloaded. Each journey (e.g. house -> health clinic) will be extracted and the distance calculated from the X,Y,Z points making up the journey. The data in the GPS will be more detailed than the paper record and will be used as the primary data source. If for some reason the GPS data did not get recorded, the paper record will be referred to.

- Data Validation - GPS data transcribed to the paper GPS survey form (see Annex III) will be checked against GPS memory for each journey to ensure that all journeys were recorded and that all required data is present. This would require checking of the following specific QC elements:

    1. Paper
        a. Odometer, altitude at start
        b. Odometer, altitude at end
        c. Odometer, altitude of major terrain breaks
    2. GPS memory
        a. Number of records matches paper records
        b. Start and end of each journey recorded
        c. Track of journey recorded

- Data Follow Up - Any missing data, whether electronic or paper can be traced to the individual interviewer and corrective instruction given for the remainder of the survey. Note: there are not expected to be many errors in the paper records at this stage, since they are checked by the supervisors in the field.

2.2.2 Project Analysis Report Processes

The reporting elements to be delivered as part of this project are outlined below and the core stages of this reporting will encompass

- Data Analysis - collate respondent survey data & validation survey data and analyze of the 2 data sets to assess the correlation of time & distance estimates to actual distances measured and the impact of personal characteristics on results.
- Reporting – 2 main reporting elements will be delivered as follows:

- Provide a "Project Analysis Report" that is an analysis of survey implementation including lessons learned and methodological recommendations for future time & distance studies
- Produce a Technical Guidance Note in accordance with requirements of TOR and discussed with Crown Agents.

o Dissemination Activities – three main activities will be undertaken
- Translation of all presentations and reports into Khmer
- Conduct a half day seminar and deliver a presentation providing an overview of the technical guidance note and surveys key findings
- Work with project partners to identify a detailed list of appropriate organizations, publications and web-sites where the survey results may be disseminated to a wider audience in Cambodia.

3. Fieldwork Documentation & Reports

A range of documentation will be used by IRL during this survey to assist in the implement of fieldwork activities and quality control. Details of these documents

1. Daily Contact Sheet

Description

- This document is used daily by each interviewers conducting the fieldwork and is checked and signed off on by their supervisor / QC staff to ensure they have completed all details correctly. Thus many copies will need to be printed for use by fieldwork teams and completed contact sheets need are retained by IRL to allow completion of weekly reports.
- These documents are used to tabulate summaries to be included in "Summary of Call" Documents – thus are the vital first step to maintaining accurate records of fieldwork progress and will form the basis of detailed incidence calculations.
- It is a summary of all contacts made during a particular day and whether or not they were "successful" or "unsuccessful".
- "Successful" this context means that the contact made resulted in a full interview being conducted. A successful contacts is coded SI in the "result" column on the table.
- For "unsuccessful" contacts the reason why it was unsuccessful is recorded according to the list of codes shown in the "contact results table" – these codes need to be recorded in the "result" column on the table.
- Regardless of success or unsuccessful interview the business name, address, and respondent age, gender & occupation is recorded for all contacts.
- For successful interviews the Qairre # will also be added to the contact sheet for reference

Completion Instructions

- *Survey location*: circle the correct location code
- *Interviewer Name:* write in your name
- *Date:* write in the date of phone arrangements
- *Qairre Number:* write in the questionnaire number
- *Respondent Address:* write in the address of the relevant company
- *Respondent Name:* write in the name of the selected respondent
- *Respondent Profile:* write in the Gender, Age and Position of the selected respondent

III. 2. Fieldwork Report

Description

- This is an overall summary of successful and unsuccessful interviews from contact sheet.
- For unsuccessful contacts the reason why as obtained from Daily Contact Sheets.
- For successful interviews we need profile total successful interviews in each location form information contained in Daily Contact Sheets.
- Successful interviews are profile them in terms of age, gender & occupation and this information is gained from tabulations of Daily Contact Sheets.
- This part of the file needs to be sent on a weekly basis to Client by IRL office.

3. Consistency Check Sheet (Quality Control)

Description

- This document is used firstly to brief interview staff – in conjunction with the actual questionnaire and instructions contain therein - so that they can be come familiar with the flow of the interview
- Also used by Internal QC staff to validate the content of the completed interviews returned to IRL office.

- Any errors / inconsistencies are raised with project supervisor/manager to determine steps for resolution.

4. Sampling Maps

Description

- Document is produced by IRL office for used by interview staff

- This document is used daily by each interview conducting the fieldwork to mark the most precise location possible of the interview location
- Also used by QC staff to return to place of interview to validate location and set of responses as required.
- Once interview is complete and validated then the interview location is plotted on IRL digital map database and location details (address, company name, contacts etc…) are attached to the points and save d a part of project documents.

5. Sampling Frame

Description

- This document is produced by IRL project supervisor / managers
- Interviewers are full briefed on the required number of interview types required in a certain location.
- Interviewer are allocated a certain quota of interviews for each project – and quota records are maintained for each interviewer by IRL project supervisor / managers

4. General Notes For Fieldwork Staff

Apart from the detailed project & survey questionnaire briefings given to interview team that are several areas of standard IRL instructions given to interviewing teams as outlined below:

General Interviewing Instructions

- **You will be given an introduction letter from IRL/Client. Present it to the respondents before the interview while you are explaining the survey objectives**
- **Ask the questions as they are written on the questionnaire.**
- **Precisely follow the instructions as they are written on the questionnaire. DO NOT read the instructions to the respondents. Instructions are for you.**
- **Speak slowly and loud enough to be comprehensible.**
- Hide the questions from the respondents do not put the questionnaire on a table but keep it in your hand. If respondents can see the content of the questionnaire, they will focus on it and not on your questions.

General Interview Reporting

- All interviewers to use the ***Daily Contact Sheets.***
- All interviewers to report to the field supervisors every day.

General Behavior and Manner Instructions

- People you are going to interview are senior managers or decision makers. Inappropriate behavior like bringing a pet is absolutely forbidden.
- Practice good hygiene, comb or brush your hair, and dress appropriately. Even if you know that the company dress is business-casual, dress up anyway. It shows professionalism and respect.
- Arrive five to ten minutes early for the interview. But don't arrive more than ten minutes early, as it might be inconvenient for your interviewers. Definitely don't be late!
- Don't bring uninvited guests like pets, children or significant others.
- Turn off your cell phone and other devices that might interrupt your interview.
- Don't eat, drink, chew gum or smoke, or even ask if it's okay. But if the respondent offers coffee or other beverages, it's okay to accept.

5. Questionnaire Briefing Document

This section is completed once the survey questionnaire is approved and contains question by question explanations that are used for fieldwork team.

6. Other Background Information

6.1 Additional Information for GPS Units

Hand-held GPS will be the primary means of measuring distance during the survey. The units are light and portable and can be utilized on any means of transport from foot to bicycle to vehicle. Although trip data can be recorded electronically, it will be transcribed to the paper questionnaire for backup. The essential information to be recorded are;

- Distance (read from the unit's odometer)
- Elevation (read at the start and end of each trip and major breaks in the terrain)

The distance reported by the unit is a 2-dimensional distance, so in mountainous terrain the elevation will need to be taken into account to calculate the true distance. The GPS units are fitted with a barometric altimeter which will accurately record changes in elevation for this purpose. The calculation of true distance will be conducted post-survey.

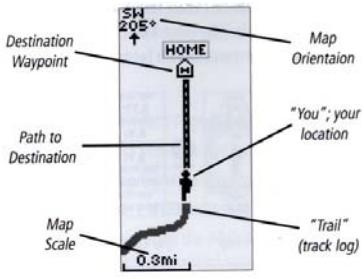
A survey manual will be developed to suit the specific requirements of this project and staff will be trained in the survey procedures. The survey procedure will be tested during the pilot phase and any improvements made before the main survey commences. The manual will be as concise as possible for ease of reference during the main survey. Staff will be familiarized with GPS and be given ample opportunity to practice using them during the training. The manual will be provided in English and Cambodian language.

Additional data such as average speed can be programmed for display, but requires more operator input. Depending on other demands placed on the survey personnel, we may train them to collect this information or alternatively, certain routes will be sampled to give representative measures of speed by terrain type and mode of transport.

Furthermore, the GPS units have an internal log capable of continuously recording the routes traveled. This information can be mapped is useful for visualizing the spatial aspects of travel. For example, it could be shown on a map whether destinations are clustered or distributed and whether they are separated by natural obstacles such as rivers. The GPS units have a limited memory which means that it is likely that the data would need to be periodically downloaded to a PC. Since this data is useful but not critical to the project, it's utilization will depend on the availability of electricity and computers in the field. The task of downloading data from the GPS units will be the responsibility of the team supervisors.

Garmin GPS eTREX SUMMIT Fact Sheet

Instead of pedometers, it is proposed that hand-held GPS receivers will be used to calculate and measure the variables of time and distance. The primary reasons for this suggested use of instrument are:



The Map Page

- **Versatility** - Pedometers can only measure journeys traversed by walking; GPS can be used with a moving vehicle – i.e. cart, bicycle, motorbike or car. *Thus can cover all the travel types required by this study.*

- **Modelling Capabilities** – not only can T&D surveys be conducted faster using a hand-held GPS, it is also relatively simple matter once the survey is completed to construct a matrix that determines units of time undertaken for a standard journey length (eg. 100 metres) in different types of terrain and by different means of transportation. GPS measurements of total distance traversed are then used with this matrix to calculate time elapsed – saving time and improving reliability of verification studies. This technique would enables the establishment of different matrices for the different regions / terrain where the surveys would be conducted *and thus addresses a primary aim of the survey to improve the reliability and accuracy of T&D reports.*

Track Log Options

The 'BEGIN' point is the starting point of a saved a track log. 'END' is the last point that was saved. The 'BEGIN-END' pair imply the direction of the saved track. If you want to retrace the track, navigate to 'END'. If you want to track back to the starting point, navigate to 'BEGIN'.

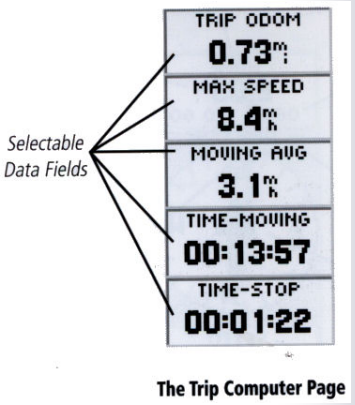
Track Log Elevation Profile

- **Future Use** - the tracks / travel paths traversed can be simply mapped in both 2D and 3D using

handheld GPS. The coordinates of each traversed journey (i.e. 'tracks') can be downloaded and used in any mapping or GIS application – either for purposes of storage, visual display or further analysis. The value of storing such data in a digital environment also means that it can be retrieved at any other future time to perform new analysis on.

- **Accuracy -** The GPS units that are recommended for use in this application are Garmin eTrex Summits. These units have the added feature of containing a barometric altimeter to accurately measure the elevation of terrain traversed. This functionality is useful in that is takes into account the variations and fluctuations of elevation in 3D thus providing even more precise calculations of distance travelled on variable terrain. The standard "Trip Page" displays vital information about travels undertaken such as an odometer for displaying distance traversed, Maximum speed, Average moving speed, Time spent moving, Time spent stopped. *These summary statistics for each journey can be used for answering some of the concerns that this survey seeks to address. Namely, how travel times can be explained by travel distances* ***and*** *which measurement, time or distance, is more reliable and relevant.*

- **Additional Data** - A GPS 'track' can also be used for identifying certain types of 'way points', often useful for indicator assessment. For example, if respondents refer to a common event indicator (such as a rest area or tea house) that breaks a journey up, it might be useful to identify where that is in relation to the overall journey.



The Trip Computer Page

- **Simplicity** - despite the range of functionality offered in these devices, they remain quite simple and easy to use. The interface of these GPS units are very straightforward to understand and, for the purposes of this survey IRL has experience using such units for other project and the project teams have experience will undergo specific training that addresses the needs of this study. Clear instructions will be supplied the chosen methodology will honour the "KISS" principle.

6.2 Sampling Locations

See Annex I – Sampling Maps

6.3 Project Schedule

See Annex II – Project Schedule

INDOCHINA RESEARCH

ANNEX III

Fieldwork Report

Crown Agents
Project Seacap

Phnom Penh
July 06

Project SEACAP – Quantitative survey

Part I

Organization of Fieldwork

1.1 – Fieldwork Team

The fieldwork team was composed of the following staff:

- 1 Project Manager
- 1 Fieldwork Manager
- 3 Fieldwork Supervisors
- 3 Quality Control (QC) staff
- 15 Interviewers (X males and X females)

See for a more detailed profile of all team members.

1.2 - Fieldwork Profile

Fieldwork was completed in 29 days including mobilization, travel time to survey locations, fieldwork supervision and Quality Control:

- Briefing: 03-04/07/06 (including Pilot test)
- Fieldwork starting date: 06/07/2006
- Fieldwork completion date: 29/07/2006
- Total sample achieved was: 600

Below is the breakdown of fieldwork duration by survey locations:

Survey locations	Area	N	No. days
A. Kompong Cham		200	20
Kompong Siem District	Rural	100	10
Memot District	Remote	100	10
B. Kompong Spoeu		200	20
Somrong Tong District	Rural	100	10
Aural District	Remote	100	10
C. Mondulkri		200	20
Piech Chenda District	Rural	100	10
Koh Nhek - Keo Seima and Orange District	Remote	100	10
TOTAL		**600**	20days

1.3 - Sampling

General:

In Rural/Remote areas:

- ◊ *Random sampling**, quota for age and sex.***
  - Survey team: 5 interviewers and 1 supervisor for each location.
  - Delivered a letter of collaboration with Ministry of Rural Development to the local authorities.
  - Selected a starting point in the village. Starting point was on the main road in the village and the supervisors checked number of household before starting the interviews.
  - Selection of 10 HH per village
  - The survey procedure used was *proportional random sampling* of residential households-3 HH interval.
  - Sampling interval of 5 per road segment was applied with interviewing alternating from one side of the road to another.
  - Used contact sheet for HH random (see attached Summary of Calls)
  - Used the questionnaire for qualified respondents and then GPS machines.
  - A qualified respondent is defined: in the age groups 13-18, 19-24, 25-34, 35-44, 45+; gender – both M and F (proportional to pop.) and 1 person only per selected HH.

Kompong Cham:

Two districts in Kompong Cham:

1- Kompong Siem Rural District, 6 Commence and 10 Villages.
2- Memot Remote District, 10 Commence and 10 Villages.

Kampong Siem (Rural)	Ampil	Krala	Village with 5 km from center	10 Hholds
	Krala	Trakuon	Village with 5 km from center	10 Hholds
		Sdach Non	Village with 10 km from center	10 Hholds
	Vihear Thum	Pongro	Village with 10 km from center	10 Hholds
	Ou Svay	Prey Chakkrei	Village with 15 km from center	10 Hholds
		Ou Svay	Village with 15 km from center	10 Hholds
	Han Cheay	Krouch Saeuch	Village with 20 km from center	10 Hholds
		Lvea Ter	Village with 20 km from center	10 Hholds
		Hanchey	Village with > 25 km from center	10 Hholds
	Srak	Srak	Village with > 25 km from center	10 Hholds
Memot (Remote)	Memong	Peuk	Village with 5 km from center	10 Hholds
	Memot	Chi Peh	Village with 5 km from center	10 Hholds
	Dar	Dar Kandaol	Village with 10 km from center	10 Hholds
	Rung	Soutey	Village with 10 km from center	10 Hholds
	Choam Kravien	Banghaeur Huos	Village with 15 km from center	10 Hholds
	Tonlung	Sla	Village with 15 km from center	10 Hholds
	Choam	Ngiev	Village with 20 km from center	10 Hholds
	Tonlung	Kaoh Thmar	Village with 20 km from center	10 Hholds
	Choam Ta Mau	Koun Krapeu	Village with > 25 km from center	10 Hholds
	Tonlung	Spean Changkum	Village with > 25 km from center	10 Hholds

Kompong Spoeu:

Two district in Kompong Spoeu:

1- Somrong Tong Rural District, 9 Commence and 10 Villages.
2- Oral Remote District, 4 Commence and 10 Villages.

Samraong Tong (Rural)	Trapeang Kong	Trakiet	Village with 5 km from center	10 Hholds
	Voa Sa	Dak Por	Village with 5 km from center	10 Hholds
	Trapeang Kong	Banh Kangkaeb	Village with 10 km from center	10 Hholds
		Trapeang Ampil	Village with 10 km from center	10 Hholds
	Pneay	Krang Ta Roatn	Village with 15 km from center	10 Hholds
	Sambour	Trapeang Noan	Village with 15 km from center	10 Hholds
	Khtum Krang	Chrak Ban Sokh	Village with 20 km from center	10 Hholds
	Saen Dei	Svay Ta Vong	Village with 20 km from center	10 Hholds
	Krang Ampil	Roluos	Village with > 25 km from center	10 Hholds
	Tumpoar Meas	Prachiev Bat	Village with > 25 km from center	10 Hholds
Aoral (Remote)	Sangkae Satob	Yang Pis	Village with 5 km from center	10 Hholds
	Ta Sal	Ta Sal	Village with 5 km from center	10 Hholds
	Reaksmei Sameakki	Reaksmei	Village with 10 km from center	10 Hholds
		Sameakki	Village with 10 km from center	10 Hholds
		Ou Phdau	Village with 15 km from center	10 Hholds
		Peam Ros	Village with 15 km from center	10 Hholds
	Haong Samnam	Tang Robang	Village with 20 km from center	10 Hholds
		Prey Totueng	Village with 20 km from center	10 Hholds
		Krang Ta Va	Village with > 25 km from center	10 Hholds
		Krang Kokir	Village with > 25 km from center	10 Hholds

INDOCHINA RESEARCH

ANNEX III

Mondulikiri Province

Four district in Mondulkiri:

1- Pech Chenda Rural District, 4 Commence and 10 Villages.
2- Koh Nheak Remote District, 1 Commence and 1 Villages.
3- Keo Seima Remote District, 2 Commence and 7 Villages.
4- Orange Remote District, 1 Commence and 2 Villages.

Pechr Chenda (Rural)	Bu Sra	Pu Lu	Village with 5 km from center	10 Hholds
		Ti Mouy	Village with 5 km from center	10 Hholds
	Srae Ampum	Pu Krouch	Village with 10 km from center	10 Hholds
		Pu Radet	Village with 10 km from center	10 Hholds
		Pu Kraeng	Village with 15 km from center	10 Hholds
		Phum Cham	Village with 15 km from center	10 Hholds
	Krang Teh	Krang Teh	Village with 20 km from center	10 Hholds
		Pou Ropet	Village with 20 km from center	10 Hholds
	Pou Chri	Pou Chri Chang	Village with > 25 km from center	10 Hholds
		Mae Pai	Village with > 25 km from center	10 Hholds
Kaoh Nheaek (Remote)	Srae Huy	Srae Huy	Village with 5 km from center	10 Hholds
Keo Seima	Srae Khtum	Srae Khtum	Village with 5 km from center	10 Hholds
		O ronar	Village with 5 km from center	10 Hholds
		Om Am	Village with 10 km from center	10 Hholds
		Chhnaing	Village with > 25 km from center	10 Hholds
	Srae Phreh	Srae Phreh	Village with 5 km from center	10 Hholds
		Pou Cha	Village with 10 km from center	10 Hholds
		Ka Ti	Village with 20 km from center	10 Hholds
Orange	Dak Dam	Pour Treng	Village with > 25 km from center	10 Hholds
		Pour Leh	Village with > 25 km from center	10 Hholds

- The weather threatens to our fieldwork. Storm from Viet Name
- Most of Village at Koh Nheak cannot go there because a lot of mud and if we want to go there we use only Elephant and boat.
- For remote Koh Nheak district we have did only one village and other change to Keo Seima district and Orang 2 village.
- Most of respondent's he always gone another place near his house not much so far.
- Difficult to explain to commence or Village event we paid to him.

1.4 - Project Implementation Issues

Prior Fieldwork:

- **Interviewers:**
◊ Spent much time for understanding the GPS machine

- **Supervisors:**
◊ Spent much time for understanding the GPS machine

During Fieldwork:

- **Liaison with local authorities**
◊ Good cooperation with local authorities (village/commune level to district level)
◊ Support from local authorities for running the fieldwork
◊ Some local authorities in the remote areas requested for approval from provincial governor rather than single approval from the ministry
◊ The incentive was prepared for the village/commune chief for his assistance
◊ A number of village chief was drunk and this required extra time to get assistance from the commune chief in the fieldwork.

- **Communications (phone, transportation….)**
◊ Access to most of survey locations except some villages in Mondolkiri province
◊ Communication through mobile service was out of coverage areas in the remote areas. Instead, ICOM was the best way for communication and this still took time for the team as the ICOM location is far from target villages.
◊ Some villages; especially in Mondolkiri province could not be accessed due to lack of infrastructure
◊ Different means of transportation were used such as Motor taxi, X-cart, eKaynþ or taxi……
◊ Lack of electricity and access to computer also an issue as the team is to download information from GPS to computer at least 1 time per 2 or 3 days

- **Respondent**
◊ Respondent's shyness that make it difficult to conduct the interview (lots of answers like "Ï do not know", "no idea", etc.) and obliged enumerators to probe more.
◊ Land dispute is a major issue that respondents confused that our team investigated for confiscating their land and this took time for the team to explain the project objectives.
◊ Many respondents felt unhappy as they went to many places for our GPS and sometimes the team paid extra money for them.
◊ Many respondents requested for school, road, well…as they thought our team are from NGOs
◊ Spent half day in the morning waiting for respondents coming back from rice fields.
◊ One interviewer met accident in the field.

- **Weather (GPS)**
◊ Spent much time for GPS as this required to re-do the work
◊ Rainy seasons: problems with GPS and road condition that made the team difficult to conduct the survey

Post Fieldwork:

◊ Supervisor spent time for checking the questionnaire
◊ Supervisor spent time for preparing transportation payment (respondents)

Quality Control Procedures
Part III
Fieldwork Results

3.1 – Fieldwork Flow

INDOCHINA RESEARCH

Project: SEACAP
Contacts Summary

	Sample
Mondulkiri	200
Kompong Chm	200
Kompong Speu	200
TOTAL	600

Country:	Cambodia
Report Date:	29-Jul-06

Province	Kg.Ch		Kg.Spoeu		Mondulkri			
Age group	Date: 05-27-July-2006		Date: 05-27-July-2006		Date: 05-27-July-2006		Total Male	Total Female
	Male	Female	Male	Female	Male	Female		
13-18	21	19	18	22	20	20	59	61
19-24	18	20	20	20	21	20	59	60
25-34	19	21	19	21	19	20	57	62
35-44	21	20	19	20	20	20	60	60
45+	19	22	21	20	20	20	60	62
TotaL: Successful	**98**	**102**	**97**	**103**	**100**	**100**	**295**	**305**
Total Sample size	**200**		**200**		**200**		**600**	

UNSUCCESSFUL INTERVIEWS	Date:	Date:	Date:	Total
Make Appointment	0	0	0	0
Available only at late night	30	9	8	47
Door Locked	42	20	30	92
Nobody answering the interviewing	11	0	0	11
Non-Living Quarter	0	0	2	2
Out of town	27	1	7	35
Partial Interview	0	0	1	1
Have participated in market research	0	0	0	0
Refused	2	6	40	48
Related field	0	0	0	0
No definite time of arrival	9	0	1	10
Wrong Age	65	103	21	189
Wrong Sex	44	12	26	82
Cancelled	0	0	0	0
Total Unsuccessful	**230**	**151**	**136**	**517**
Total successful	**200**	**200**	**200**	**600**
Total Contacts	**430**	**351**	**336**	**1117**

3.2 – Quality Control Results

- ◊ No particular QC problems encountered as the questionnaire was kept short and simple. In addition, GPS handsets greatly reduced potential erroneous practices.
- ◊ As interviewers were asked to redo GPS verification trip in case any GPS data missing, therefore, all data was recorded properly.

PROJECT: TIME & DISTANCE STUDY - Cambodia 2006

INDOCHINA RESEARCH
Indochina Research (Cambodia) Ltd
9 Mao Tse Tung Boulevard, PO Box: 629
Tel: (855) 23 215 184, 023 362 392
Fax: (855) 23 215 190
Phnom Penh, Cambodia

Job No.	MS 462						CH:
	(1)	(2)	(3)	(4)	(5)	(6)	CO:
Interview No.	1						DC:
Interviewer Name							
Interviewer No							

S 3 What is the highest grade you completed?

(16)

Some primary school	1
Completed primary school	2
Some secondary school	3
Completed secondary school	4
Some/completed vocational school	5
Some/completed collage	6
Some/completed university	7

S 4 What is your occupation? Position :_____ (17) Industry: _____

INTERVIEW ANSWER GRID

Tick to ask	Location (multiple answer)	Q1a Do you go to…? Yes	Q1a No	Q1b Name and type of the place?	Q1c Frequency? per week	per month	per year	Q2a Transport modes use? (MA Possible)	Q2b Use most mode? (SA)	Q3a Distance from house?	Q3b Time spend from house?	Q3c Times go and back is different Yes	Q3c No	Q3d Time spend back to house?
	(5) - (12)	(13)		(14)-(16)	(17)			(18) (32)	(33)	(34)	(35)	(36)		(37)
□	School	1	2					Walking 1 ..... 1 Bike/bycicle (Kong) 2 ..... 2 Motorbike 3 ..... 3 Tuk Tuk 4 ..... 4 Ox Cart (Rotes Kor) 5 ..... 5 Motorised boat 6 ..... 6 Boat 7 ..... 7 Car 8 ..... 8 Tok Tok 9 9 Motorbike-pulled-cart 10 10 Other 11 11		km m	h min	1	2	h min
		(38)		(39)-(41)	(42)			(43) (57)	(58)	(59)	(60)	(61)		(62)
□								Walking 1 1						

INDOCHINA RESEARCH

ANNEX III

INDOCHINA RESEARCH

ANNEX III

GPS SURVEY RECORD SHEET

Location (multiple answer) (5) - (12)	Go to...? (from Q1a) Yes (13)	No	By transport modes? (from Q2b) (14)	GPS RecordFrom HOME to PLACE	GPS RecordFrom HOME to PLACE	Supervisor Check
School	1	2	Walking 1 Bike/bycicle (Kong) 2 Motorbike 3 Tuk Tuk 4 Ox Cart (Rotes Kor) 5 Motorized boat 6 Boat 7 Car 8 Tok Tok 9 Motorbike-pulled-cart 10 Other 11	GPS Unit ID (15) STAR / END / TOTAL Waypoint No. (16) (17) (18) Elevation (19) (20) (21) Trip Odom Km m (22) Km m (23) Km m (24) Time : (25) : (26) : (27) Time taking break1 : (28) : (29) : (30) Time taking break2 : (31) : (32) : (33) Time taking break3 : (34) : (35) : (36)	GPS Unit ID (37) STAR / END / TOTAL Waypoint No. (38) (39) (40) Elevation (41) (42) (43) Trip Odom Km m (44) Km m (45) Km m (46) Time : (47) : (48) : (49) Time taking break1 : (50) : (51) : (52) Time taking break2 : (53) : (54) : (55) Time taking break3 : (56) : (57) : (58)	Waypoint no. ....OK Track on map ....OK Distance ....OK
Health Center	1	2	Walking 1 Bike/bycicle (Kong) 2 Motorbike 3 Tuk Tuk 4 Ox Cart (Rotes Kor) 5 Motorized boat 6 Boat 7 Car 8 Tok Tok 9 Motorbike-pulled-cart 10 Other 11	GPS Unit ID (59) STAR / END / TOTAL Waypoint No. (60) (61) (62) Elevation (63) (64) (65) Trip Odom Km m (66) Km m (67) Km m (68) Time : (69) : (70) : (71) Time taking break1 : (72) : (73) : (74) Time taking break2 : (75) : (76) : (77) Time taking break3 : (78) : (79) : (80)	GPS Unit ID (81) STAR / END / TOTAL Waypoint No. (82) (83) (84) Elevation (85) (86) (87) Trip Odom Km m (88) Km m (89) Km m (90) Time : (91) : (92) : (93) Time taking break1 : (94) : (95) : (96) Time taking break2 : (97) : (98) : (99) Time taking break3 : (100) : (101) : (102)	Waypoint no. ....OK Track on map ....OK Distance ....OK
Water Source	1	2	Walking 1 Bike/bycicle (Kong) 2 Motorbike 3 Tuk Tuk 4 Ox Cart (Rotes Kor) 5 Motorized boat 6 Boat 7 Car 8 Tok Tok 9 Motorbike-pulled-cart 10 Other 11	GPS Unit ID (103) STAR / END / TOTAL Waypoint No. (104) (105) (106) Elevation (107) (108) (109) Trip Odom Km m (110) Km m (111) Km m (112) Time : (113) : (114) : (115) Time taking break1 : (116) : (117) : (118) Time taking break2 : (119) : (120) : (121) Time taking break3 : (122) : (123) : (124)	GPS Unit ID (125) STAR / END / TOTAL Waypoint No. (126) (127) (128) Elevation (129) (130) (131) Trip Odom Km m (132) Km m (133) Km m (134) Time : (135) : (136) : (137) Time taking break1 : (138) : (139) : (140) Time taking break2 : (141) : (142) : (143) Time taking break3 : (144) : (145) : (146)	Waypoint no. ....OK Track on map ....OK Distance ....OK
Administration Office	1	2	Walking 1 Bike/bycicle (Kong) 2 Motorbike 3 Tuk Tuk 4 Ox Cart (Rotes Kor) 5 Motorized boat 6 Boat 7 Car 8 Tok Tok 9 Motorbike-pulled-cart 10 Other 11	GPS Unit ID (147) STAR / END / TOTAL Waypoint No. (148) (149) (150) Elevation (151) (152) (153) Trip Odom Km m (154) Km m (155) Km m (156) Time : (157) : (158) : (159) Time taking break1 : (160) : (161) : (162) Time taking break2 : (163) : (164) : (165) Time taking break3 : (166) : (167) : (168)	GPS Unit ID (169) STAR / END / TOTAL Waypoint No. (170) (171) (172) Elevation (173) (174) (175) Trip Odom Km m (176) Km m (177) Km m (178) Time : (179) : (180) : (181) Time taking break1 : (182) : (183) : (184) Time taking break2 : (185) : (186) : (187) Time taking break3 : (188) : (189) : (190)	Waypoint no. ....OK Track on map ....OK Distance ....OK
Market	1	2	Walking 1 Bike/bycicle (Kong) 2 Motorbike 3 Tuk Tuk 4 Ox Cart (Rotes Kor) 5 Motorized boat 6 Boat 7 Car 8 Tok Tok 9 Motorbike-pulled-cart 10 Other 11	GPS Unit ID (191) STAR / END / TOTAL Waypoint No. (192) (193) (194) Elevation (195) (196) (197) Trip Odom Km m (198) Km m (199) Km m (200) Time : (201) : (202) : (203) Time taking break1 : (204) : (205) : (206) Time taking break2 : (207) : (208) : (209) Time taking break3 : (210) : (211) : (212)	GPS Unit ID (213) STAR / END / TOTAL Waypoint No. (214) (215) (216) Elevation (217) (218) (219) Trip Odom Km m (220) Km m (221) Km m (222) Time : (223) : (224) : (225) Time taking break1 : (226) : (227) : (228) Time taking break2 : (229) : (230) : (231) Time taking break3 : (232) : (233) : (234)	Waypoint no. ....OK Track on map ....OK Distance ....OK

INDOCHINA RESEARCH

ANNEX III

GPS SURVEY RECORD SHEET

Location (multiple answer) (5) - (12)	Go to...? (from Q1a) Yes	No	By transport modes? (from Q2b)	GPS RecordFrom HOME to PLACE	GPS RecordFrom HOME to PLACE	Supervisor Check
Rice Cultivation Place	1	2	Walking 1 Bike/bycicle (Kong) 2 Motorbike 3 Tuk Tuk 4 Ox Cart (Rotes Kor) 5 Motorized boat 6 Boat 7 Car 8 Tok Tok 9 Motorbike-pulled-cart 10 Other 11	GPS Unit ID (235) STAR / END / TOTAL Waypoint No. (236) (237) ---------- (238) Elevation (239) (240) (241) Trip Odom Km m (242) Km m (243) Km m (244) Time : (245) : (246) : (247) Time taking break1 : (248) : (249) : (250) Time taking break2 : (251) : (252) : (253) Time taking break3 : (254) : (255) : (256)	GPS Unit ID (257) STAR / END / TOTAL Waypoint No. (258) (259) ---------- (260) Elevation (261) (262) (263) Trip Odom Km m (264) Km m (265) Km m (266) Time : (267) : (268) : (269) Time taking break1 : (270) : (271) : (272) Time taking break2 : (273) : (274) : (275) Time taking break3 : (276) : (277) : (278)	Waypoint no. ....OK Track on map ....OK Distance ....OK
Wat, Shrine, etc	1	2	Walking 1 Bike/bycicle (Kong) 2 Motorbike 3 Tuk Tuk 4 Ox Cart (Rotes Kor) 5 Motorized boat 6 Boat 7 Car 8 Tok Tok 9 Motorbike-pulled-cart 10 Other 11	GPS Unit ID (279) STAR / END / TOTAL Waypoint No. (280) (281) ---------- (282) Elevation (283) (284) (285) Trip Odom Km m (286) Km m (287) Km m (288) Time : (289) : (290) : (291) Time taking break1 : (292) : (293) : (294) Time taking break2 : (295) : (296) : (297) Time taking break3 : (298) : (299) : (300)	GPS Unit ID (301) STAR / END / TOTAL Waypoint No. (302) (303) ---------- (304) Elevation (305) (306) (307) Trip Odom Km m (308) Km m (309) Km m (310) Time : (311) : (312) : (313) Time taking break1 : (314) : (315) : (316) Time taking break2 : (317) : (318) : (319) Time taking break3 : (320) : (321) : (322)	Waypoint no. ....OK Track on map ....OK Distance ....OK

VIETNAM ● CAMBODIA ● LAO PDR