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*CR 2015/9*

**International Court  
of Justice**

**Cour internationale  
de Justice**

**THE HAGUE**

**LA HAYE**

**YEAR 2015**

*Public sitting*

*held on Monday 20 April 2015, at 3 p.m., at the Peace Palace,*

*President Abraham presiding,*

*in the cases concerning Construction of a Road in Costa Rica along the San Juan River  
(Nicaragua v. Costa Rica); Certain Activities carried out by Nicaragua  
in the Border Area (Costa Rica v. Nicaragua)*

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**VERBATIM RECORD**

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**ANNÉE 2015**

*Audience publique*

*tenue le lundi 20 avril 2015, à 15 heures, au Palais de la Paix,*

*sous la présidence de M. Abraham, président,*

*dans les affaires relatives à Construction d'une route au Costa Rica le long du fleuve San Juan  
(Nicaragua c. Costa Rica) ; Certaines activités menées par le Nicaragua  
dans la région frontalière (Costa Rica c. Nicaragua)*

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**COMPTE RENDU**

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*Present:* President Abraham  
Vice-President Yusuf  
Judges Owada  
Tomka  
Bennouna  
Caçado Trindade  
Greenwood  
Xue  
Donoghue  
Gaja  
Sebutinde  
Bhandari  
Robinson  
Gevorgian  
Judges *ad hoc* Guillaume  
Dugard  
Registrar Couvreur

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*Présents :* M. Abraham, président  
M. Yusuf, vice-président  
MM. Owada  
Tomka  
Bennouna  
Caçado Trindade  
Greenwood  
Mmes Xue  
Donoghue  
M. Gaja  
Mme Sebutinde  
MM. Bhandari  
Robinson  
Gevorgian, juges  
MM. Guillaume  
Dugard, juges *ad hoc*  
  
M. Couvreur, greffier

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Le PRESIDENT : Veuillez vous asseoir. Monsieur le professeur Kondolf, je vous invite à reprendre place à la barre. Je me tourne vers le conseil du Nicaragua. Souhaitez-vous procéder à un interrogatoire complémentaire ? Si c'est le cas, vous avez la parole, Monsieur Reichler.

Mr. REICHLER: Thank you, very much, Mr. President, Members of the Court. In case anyone is concerned, this will be much, much, briefer than the cross-examination.

Good afternoon, Professor Kondolf, I would like to begin where Mr. Wordsworth left off. If you recall, he referred you to page 8 of your March 2015 summary report, paragraph 22, and specifically to the chart that you prepared. And then he asked you some questions about that chart. It is projected on the screen now. That is your chart, from your 2015 report?

Mr. KONDOLF: That is correct.

Le PRESIDENT : M. Wordsworth demande la parole. Monsieur Wordsworth, il faut que vous veniez au micro pour parler de telle sorte que les interprètes puissent vous entendre et traduire.

Mr. WORDSWORTH: I apologize. I do not recall asking questions about that chart on page 8. Dr. Kondolf referred to that chart; in fact, that chart does not contain the relevant figure about which I was asking questions to Dr. Kondolf.

Mr. REICHLER: Well, Mr. President, we can always consult the transcript, but unless my memory is off, this chart was referred to in the cross-examination. Dr. Kondolf was asked, on the basis of this chart, about the total area from which the eroding sediments were determined to emanate. And he was asked about the difference in the total area from which sediments were said to emanate, with the total area used in the calculation by Costa Rica's experts. I seem to recall numbers such as 600,000 and 200,000, in terms of comparing the surface areas from which the different parties had calculated the amount of erosion, the amount of sediment, that is contributed to the river by the road. And this is that calculation. May I proceed?

Le PRESIDENT : Poursuivez, Monsieur Reichler.

Mr. REICHLER: Professor Kondolf, does this chart reflect your methodology, and your calculation of the amount of sediment that enters the river as a result of Costa Rica's construction of the road?

Mr. KONDOLF: Yes, it does.

Mr. REICHLER: Would you please explain, as briefly as possible, without sacrificing accuracy, what method you followed and how you calculated the amount of sediment entering the river from the road.

Mr. KONDOLF: Well, first we began with the map of area disturbed that was reported by Mende and Astorga, the Costa Rican experts, and . . .

Le PRESIDENT : Pardon, je vous interromps, Monsieur le professeur. J'ai l'impression que M. Wordsworth veut encore faire quelques mètres jusqu'au micro. Vous avez la parole, Monsieur Wordsworth.

Mr. WORDSWORTH: I genuinely apologize, and I do not want to keep on getting up and down. But I did not ask general questions about Dr. Kondolf's methodology. As I understood the purpose of re-examination, it is to ask questions coming out of the questions put in cross-examination. Not to offer a sort of examination-in-chief, where Dr. Kondolf explains to the Court his general methodology. The Court has that by reading the summary. Thank you.

Mr. REICHLER: May I respond, Mr. President?

Le PRESIDENT : Merci. Monsieur Reichler. Oui.

Mr. REICHLER: Well, I certainly agree that Mr. Wordsworth spent 50 minutes of his 67 minutes talking about macroinvertebrates. But, at the end of his examination, he introduced the subject. He raised the question of how Dr. Kondolf had calculated the sediment entering the river from the road. Including specific questions relating to the surface area, from which his calculations were derived. And, he offered some helpful information on how Costa Rica's expert had made his calculations. Of course, the Court knows what it intended by the instructions it gave to counsel

with regard to examination and re-examination of witnesses. And we of course follow the Court's understanding of its own instruction. But, as we understand it, if the subject-matter is introduced on cross-examination, then the party that has presented the witness has the right to ask the witness about the same subject-matter. I do not believe — at least it is not our understanding — that we are limited to the same questions that were asked, but it is a matter of whether the subject-matter was introduced. And, I would suggest that, in this case, if Mr. Wordsworth did not want us to be able to ask Professor Kondolf about the chart and his calculations of the amount of sediment entering the river from the road, then he could have presented that by not asking the questions that he did. But, of course, we would be guided by the Court's Judgment, more than that, we will follow the Court's Judgment in this regard, and I would appreciate it if we can continue with this line of questioning. I do not expect this re-examination to last more than 15 minutes.

Le PRESIDENT : Poursuivez, Monsieur Reichler.

Mr. REICHLER: Professor Kondolf, the question I think that was pending, when Mr. Wordsworth made his objection, was whether this chart reflects your methodology and your calculation of the amount of sediment that enters the river as a result of Costa Rica's construction of the road. Would you answer that, please?

Mr. KONDOLF: Yes, that is correct.

Mr. REICHLER: And then, I started to ask you, would you please explain, as briefly as you can, without sacrificing accuracy, what method you followed, and how you calculated the amount of sediment entering the river from the road?

Mr. KONDOLF: OK, so the road extends about 108 km along the river's edge, the area disturbed by the road was reported by Mende and Astorga as 3.5 million sq m.

Mr. REICHLER: Can I just interrupt you for a moment?

Mr. KONDOLF: Yes.

Mr. REICHLER: Mende and Astorga, they are . . . ?

Mr. KONDOLF: They are experts for Costa Rica. And their expert reports and maps were used in multiple expert reports.

Mr. REICHLER: Please continue.

Mr. KONDOLF: So, through that we have the road itself, which we used the figure of 10 m width, which we used in a number of these reports. And we treated that separately, but on either side of that 10 m, you would have slopes, the area that was cut into the hillside and the area below, typically. And, so, for that remaining area, we looked at our 17 severely eroding sites. And, those actually totalled — I think the figure earlier was used, 612 — but I see I have 788,000 sq m as being occupied by those 17 severely eroding sites. For those areas, excluding the 10 m strip of road, based on our analysis of the aerial photographs and imagery, we determined that about 40 per cent of those areas were affected by active gullying and landsliding. So we applied a rate for that. And in this case it was 558 m per year, which was a rate actually used by the Costa Rican studies. For the rest of that, the other 60 per cent of those areas, of the severely eroding areas, we used a rate for surface erosion, which was 0.03 to 0.06 m per year, I believe. So that covers the severely eroding sites. Then, in addition, you have the road, 108 km of road, 10 m wide: to that we applied a very conservative surface erosion figure, I believe, 0.01 to 0.02 m per year, and then that covers the severely eroding sites, the entire road, but not the rest of the disturbed area. And for the rest of the disturbed area, we simply applied — if I recall correctly — the surface erosion rate of 0.01 to 0.02, or let us see: OK, actually, for the rest of the severely eroding sites we use 0.03 to 0.06 for the road, 0.01 to 0.02 m per year for the rest of the disturbed area.

So this gave us values for all these different components which should be eroding at different rates; we could add that up to come up with a total for the road itself. In addition, you have access roads, there are between 332 and 440 km of access roads. This has been reported differently in different places: we used the lower figure, 332 km, and for that, we assumed the average width of disturbance that prevailed along the road itself, which was 30 m, and to that we multiplied the low surface erosion rate of 0.01 to 0.02. Now that gave us an amount eroding from those roads which was very conservative. Then the sediment has to get from these places into the river. Along Route 1856, right along the river — it is very close to the road — we assigned what we call a

sediment delivery ratio of 0.6— meaning that we assume 60 per cent of that sediment is getting directly into the river which, I think, is quite conservative given what you see in the photographs.

For the access roads, we assumed a lower value, which is 0.1 or 10 per cent, which again is quite a bit lower than probably what you would mostly see in the literature, so it is very conservative. So we add those two together, and we come up with our total figure. And again, when you're looking at the figures, it is good to remember that there is a difference between cubic metres per year and tons per year. The tons per year figure is larger than the cubic metres per year.

Mr. REICHLER: The total cubic metres per year that you calculated, would you point that out on the chart?

Mr. KONDOLF: Yes, so that is on the bottom line, the right column: 116,000 to 150,000 m<sup>3</sup> per year.

Mr. REICHLER: That is sediments going into the river.

Mr. KONDOLF: Going *into* the river.

Mr. REICHLER: Can you do the calculation in your head, how many tons per year that is?

Mr. KONDOLF: As I recall, the tons per year equivalent is about 190 to 250, something like that.

Mr. REICHLER: 190 to 250 *thousand* tons per year.

Mr. KONDOLF: Thousand tons per year, right.

Mr. REICHLER: Do you consider that this a reliable method for calculating the amount of sediment entering the river from the road?

Mr. KONDOLF: Yes, I do.

Mr. REICHLER: And why?

Mr. KONDOLF: Well, we have accounted for all the eroding areas, we have applied conservative rates for how much . . .

Le PRESIDENT : Monsieur Wordsworth. Je vous interromps un instant, Monsieur le professeur. Voulez-vous venir au micro, s'il vous plaît ?

Mr. WORDSWORTH: Again, I apologize, but this has nothing at all to do my cross-examination. The questions have now strayed from very broad questions about methodology, while I asked one very specific question about surface area of slopes. You have just had a lengthy discourse on every aspect of methodology and now you have a wholly general question about the reliability of that methodology. It has nothing to do with the issues raised in cross-examination this morning.

Le PRESIDENT : Merci, Monsieur Wordsworth. Je demanderai à M. Reichler de prendre garde à ce que l'interrogatoire complémentaire ne se transforme pas en un équivalent de l'interrogatoire principal, lequel, comme vous le savez, a été remplacé par l'exposé écrit de l'expert ; et de cibler davantage ses questions sur les sujets soulevés lors du contre-interrogatoire selon la règle que j'ai rappelée aux Parties au début de ces audiences. Merci.

Mr. REICHLER: Of course, Mr. President, and thank you. Mr. Wordsworth asked you about a difference between your calculation and the calculation made by Costa Rica's expert. In what ways are your calculations different from those of Costa Rica's experts and in what ways are they similar?

Mr. KONDOLF: Well, one difference that Mr. Wordsworth highlighted was a difference in areas of disturbance, I believe that is what he was saying. And I keep mentioning the figure of 612,000 — I see in my report, I say we have got 788,000 sq m within the severely eroded areas. That would be potentially one source of difference. While we are talking about area, we have to remember that the Costa Rican experts — Mende and Astorga — reported 3.5 million sq m that was disturbed and, I believe, when you add up the total areas disturbed for what they call the slopes, cut slopes and fill slopes, and the road area that was disturbed, you come up with a much

much lower figure; I forget what that is, but somehow they are not accounting for much of what they earlier had said was disturbed. That is one difference.

Mr. REICHLER: Mr. Wordsworth suggested to you that — and I am sure he won't object to this question because he'll remember that he questioned you about it — Mr. Wordsworth suggested to you that an even better way to determine the amount of sediment entering the river from the road — that is, better than the way *you* calculated it, better than the way Costa Rica's experts calculated it — would have been to obtain samples of suspended sediment from upstream of the road and compare them with samples taken downstream from it. Do you agree with Mr. Wordsworth?

Mr. KONDOLF: No, I think it is better to stick with the direct evidence that you have, on the sites: you see the erosion, you can measure or estimate the erosion going into the river; you have evidence such as the deltas, etc. If you work with something secondary such as the sediment loads that would be measured upstream and downstream, then you get into all the issues of the very high variability in the flows, in the sediment loads, from year to year, and I mean — in a way it is a bit similar to the debates about climate change, which you know we have in the States, where people . . .

Mr. REICHLER: I don't think Mr. Wordsworth wants you to get into that, and I think I agree with him!

Mr. KONDOLF: It is a very noisy record and so, similarly, finding the signal in a very noisy record is more difficult than going with the direct evidence of seeing sediment being delivered to the river.

Mr. REICHLER: Mr. Wordsworth asked you about impacts of the sediment entering the river. Does the sediment that enters the river from the road have an impact on the Lower San Juan River?

Mr. KONDOLF: It certainly does. If you talk about the Lower San Juan River specifically, then it stands to reason that every ton of sediment that is added to the river eventually gets carried

down towards the bifurcation and could potentially contribute to the maintenance problems that Nicaragua was facing with dredging that lower part of the river.

Mr. REICHLER: Thank you, Professor Kondolf, and thank you, Mr. President. I have no further questions.

Le PRESIDENT : Merci, Monsieur Reichler. Monsieur Kondolf, restez à votre place car certains juges voudraient vous poser des questions. Je vais leur donner la parole selon l'ordre d'ancienneté et je vais vous demander de répondre à chaque question dès qu'elle vous aura été posée.

Je donne d'abord la parole au juge Greenwood.

Judge GREENWOOD: Thank you. Good afternoon, Professor Kondolf.

Mr. KONDOLF: Good afternoon.

Judge GREENWOOD: Professor, help me with two things, would you? The first — it may well be the answer is already there in the record, but I have just not been able to find it. At page 17 of your summary statement for today's testimony, you refer to at least eight huge deltas of road-derived sediment. Can you give us an idea, do you know, how many deltas there are as a whole in this stretch of the river on the Costa Rican bank?

Mr. KONDOLF: This stretch of the river being . . . ?

Judge GREENWOOD: The area that the road runs along, the 100 km or so.

Mr. KONDOLF: OK, I would just have to guess at this point. I do not know. That is an interesting question.

Judge GREENWOOD: You do not know, right, fair enough. I am just trying to get a feel for whether eight was pretty much all that there was or are these just the eight largest out of a much greater number?

Mr. KONDOLF: I would say in these severely eroding areas, these eight would probably be *the* deltas but as you get to parts of the river that were not so severely impacted, there would certainly be some natural deltas.

Judge GREENWOOD: Right, because there are 17 severely eroding sites are there not? But only eight of them have produced these deltas, is that correct?

Mr. KONDOLF: Yes, that is correct.

Judge GREENWOOD: Thank you. Quite what the significance of that is I will have to try and work out later. The second question concerned a remark made by Professor Thorne in the summary statement for his evidence last week, in the *Certain Activities* case and which I want to put to you now because it is about the relationship between the two cases.

At paragraph 4.7 of his statement he says this and, you may not have it with you so I will read it out to you:

“Whilst the addition of Road-derived sediment is claimed to pose serious environmental risks to the Río San Juan, this seems at odds with Professors van Rhee and de Vriend’s expert opinion that, despite removal of a much larger volume of sediment from a much smaller branch of the River, ‘any negative environmental effect of Nicaragua’s modest activities will be insignificant’.”

I would just like you to help us please to understand the relationship between what your colleague Professor van Rhee said about the environmental effect of removing sediment from the Lower Río San Juan with what is being said about the insertion of sediment into an upper stretch of the river.

Mr. KONDOLF: Well, since the reference is to impacts in the lower part of the river, in the Lower Río San Juan specifically, I think the principle is simply that there is so much sediment coming into that part of the river that, to the extent that you add to that sediment, you are adding to the impact and the burden to dredge. And I think it is useful to remember that these very high sediment loads in the rivers — 85 per cent of the drainage area is on the Costa Rican side and that area has been severely deforested, so the sediment loads are much, much higher now than they were naturally — so this very large sediment load coming into the lower part of the river is responsible for many of the problems that have been described in the previous case and so I think

one way to look at it is that as the road adds additional sediment to this, then that just makes the problem worse downstream.

Judge GREENWOOD: Thank you, Professor Kondolf, that is interesting but that is not quite what I thought Professor Thorne was getting at, and maybe I had better ask this question of him later in the week. I thought he was making perhaps a rather more simple point which is, putting it crudely, if taking 200,000 cubic metres of sediment out of the Lower Río San Juan has an insignificant environmental impact, why does putting 200,000 cubic metres of sediment *in* to the Upper Río San Juan have a serious environmental impact?

Mr. KONDOLF: Maybe I am not explaining this well but I think the perspective would be that, because there is too much sediment, that is already a problem, so you are simply adding to that. The dredging seems not to be creating a permanent change now because it keeps filling in so it is not changing significantly the character of the river there.

Judge GREENWOOD: Thank you very much, Professor Kondolf.

Le PRESIDENT : Merci. Je donne maintenant la parole à Mme la juge Xue.

Judge XUE: Thank you, Mr. President. Professor Kondolf, I would like to seek a technical clarification from you. In the Nicaragua's experts' report, not only you but your colleagues as well, it is said that the construction of the Road 1856 has caused a large quantity of sediment into the San Juan River. Given the hydrological and meteorological conditions of the San Juan River, the suspended sediment will flow into the river downstream. As the San Juan River bifurcates, branches out at the Delta Colorado into the Colorado River and the Lower San Juan, as your reports indicate, about 80-90 per cent of the water flows into the Colorado River. So my understanding or I assume that in that case most of the suspended sediment would flow into the Colorado River. Are there any factors or variables that I do not know that may render my understanding incorrect?

Mr. KONDOLF: No, I believe you are quite correct and if I could expand a little bit on that, the Costa Rican Electricity Institute, ICE, in their report, they have estimated that we have two components of the sediment. There is the coarser sediment, mostly sand that is moving along the

bed, so bed material load or they call it bed sediment load, and then there is the suspended sediment, which can include some sand but it is probably more all the mud and the silt there. So they are saying that, of the suspended part of the sediment, they are estimating that 16 per cent goes into the Lower Río San Juan.

Judge XUE: Sixteen or 60?

Mr. KONDOLF: Sixteen — 16 if I recall correctly. But they are estimating that, I believe, 20 per cent of the *bed* material load is going in there, so a slightly higher percentage of the sediment on the bed they are estimating to go into the Lower Río San Juan. But basically you are right that there is a flow split, most of the water and most of the sediment would be going down the Río Colorado.

Judge XUE: Thank you very much.

Le PRESIDENT : Merci. Je donne maintenant la parole à M. le juge Bhandari.

Judge BHANDARI : Thank you, Mr. President. Professor Kondolf, I have two questions for you. I recall both from your expert statement and your testimony this morning that there is lack of data on fish species in the San Juan River. Are you aware of the reasons for the lack of data?

Mr. KONDOLF: I believe that it is just a problem of not that many scientists working there and it is a large area. There are many parts of the world where you do not have very good data on these kinds of resources.

Judge BHANDARI: My second question is: at paragraph 59 of your expert statement, which is at page 20, you advised that large earthquakes in the region are inevitable and when they occur massive failures of the slope destabilized by Route 1856 can be expected. In the light of this statement, I would like to put these questions:

- (1) How exactly could you define the reason and what is the basis for your conclusion that large earthquakes in this region are inevitable?

(2) Is it possible to estimate the quantity of soil displacement into the river that may be caused in the event of an earthquake in the region you refer to?

Mr. KONDOLF: First, we know it is a geologically active area and there are volcanoes and usually there are earthquakes associated with this kind of active geology — tectonic activity, as we say. We also have the benefit of a report by Alan Astorga, who is a Costa Rican geologist and he reported that since 1700, if I recall correctly, I believe he said that there had been 17 major earthquakes in the Río San Juan basin; so that's about 310 years, 17 earthquakes over that period of time: roughly one every 20 years. So that gives us a sense of how often we might expect these to happen.

The question of how much sediment would be produced: Dr. Astorga also made an estimate of how much sediment would come off of the volcanoes when you have these kinds of earthquakes and he estimated between 1 and 3-4 million tons, I believe it was, that would occur in each of these incidents. However, I think your question is more about the road and the likely erosion from the road that would happen. So I have not tried to make a global estimate of all the sediment that would likely be moved during such an event, but in one of my reports, we made estimates of the volume of fills in some of these very large road crossings and you could expect that almost all of that, or a very large part of that, could be mobilized and, I am trying to remember, but I think we were looking at something like 30,000 cubic metres in one case — I might be mistaken, but they were quite large numbers.

Judge BHANDARI: Thank you very much, Dr. Kondolf.

Le PRESIDENT : Monsieur le professeur, la dernière question vous sera posée par M. le juge Robinson, à qui je donne maintenant la parole.

Judge ROBINSON: Thank you very much, Mr. President. Professor, I would like to take you to paragraph 23 of your summary statement. There you are dealing with what you call Costa Rica's underestimation of the road's sediment contribution and you make the point that the estimates are deeply flawed and significantly understate the amount of sediment being deposited into the river. And then you look at the new reports from Costa Rica, submitted in their Rejoinder,

in which you say Costa Rica concedes most of those errors. But then you go on to say that the new reports still have many new flaws and you identify four. In summary form, the first is the new UCR report and one of the flaws that you mention is that, although the new report has added four more sites, it has still ignored many of the severely eroding sites; secondly, you look at the new Mende inventory; thirdly, the dramatically lower roadbed erosion figure and, finally, you examine disturbed areas that have been excluded from Costa Rica's calculations.

The question I would like to ask is whether your position is that these flaws, either taken individually or collectively, contradict Costa Rica's estimate either totally or partially. I would imagine you would have to say the latter, but it is still a matter for you; but, if it is the latter, would you be able to tell us to what degree, to what percentage — I don't know whether that is something you can work out at this time — whether the contradiction is 40 per cent, 50 per cent, or just what percentage? Thank you.

Mr. KONDOLF: I would agree that I think these flaws seriously undermine the credibility of the results, so I would put it, rather than the total, I would say put it in the partial category. As you say, there certainly are some things that are no doubt correct about these reports, but there are enough things that are problematic and the problems are severe enough that I think they render the final conclusion to be invalid. As to assigning a percentage: this is something I could certainly do by going through each component and looking at how certain things have been underestimated or overestimated and I could probably come up with a composite figure like that but, unfortunately, off the top of my head, I cannot do that.

Judge ROBINSON: Thank you. Well, you can't do it now but I think I would profit from such an estimate from you — speaking for myself. But I appreciate that you can't do it now.

Le PRESIDENT : Merci, Monsieur le professeur. Je crois qu'il y a encore une question qu'un juge souhaite vous poser. Je donne la parole à mon collègue, le juge Tomka.

Judge TOMKA: Thank you very much, Mr. President. Professor Kondolf thank you for appearing. Could you clarify for me — if I may take you back to the table on page 8 of your 16 March this year summary of your reports? You give as a total figure of sediment delivered from

Route 1856 to be within 116,000 to 150,000 cubic metres per year, that is for the length of 108 km, assuming that 60 per cent is delivered to the other river. May I ask you what is the average width of the river?

Mr. KONDOLF: It is probably in the order of 100 m or something like that.

Judge TOMKA: 100 m. So it means that if these figures are correct, for roughly 1,000 sq m the amount of sediment would be between 1.07 and 1.38 cubic metres. I have divided your total amount by the length of the river and then applied the width you have given to me. Is that correct? That means for the area which is more than twice as big as this Great Hall there would be around 1 cubic metre of sediment: an average.

Mr. KONDOLF: I am afraid I would have to — you are probably correct, but I would need to run that again. So you are potentially dividing the total cubic metres by 108 times 100 metres. Well, I will trust your arithmetic, there.

Judge TOMKA: Do you have a figure? What percentage of the sediment is at the ended flushed to the sea? Because not everything remains in the bed, I understand that a certain amount remains in the bed but some is still transported further down and at the end delivered to the sea, either through the Colorado River or through the San Juan.

Mr. KONDOLF: Yes, again these are annual figures and so each year you get the same amount. In terms of what flows out to the sea, the percentage: there has been some debate about that. Certainly the majority of the sediment will probably be deposited in the delta, that is why the delta is there — the coarser sediment is deposited near the head of the delta; much of the finer sediment is deposited as you go further downstream and the freshwater mixes with salt. Then you get flocculation of some of the clays at that point. Certainly there is some part that goes out to sea. For this delta, I do not know what the overall percentage would be that would go out to sea.

Judge TOMKA: Thank you very much. Thank you. Merci, Monsieur le président.

Le PRESIDENT : Merci, Monsieur le professeur. Ainsi s'achève votre déposition. Nous tenons à vous remercier d'avoir bien voulu comparaître devant la Cour. Vous pouvez quitter la barre. Merci.

Mr. KONDOLF: Thank you.

Le PRESIDENT : La Cour entendra maintenant Monsieur Andrews que j'invite à prendre place à la barre.

Mr. ANDREWS: Thank you.

Le PRESIDENT : Bonjour, Monsieur le professeur.

Mr. ANDREWS: Good day.

Le PRESIDENT : Je vous prie de bien vouloir faire la déclaration solennelle prévue pour les experts, figurant à l'article 64, l'alinéa *b*) du Règlement de la Cour.

Mr. ANDREWS:

“I solemnly declare upon my honour and conscience that I will speak the truth, the whole truth and nothing but the truth, and that my statement will be in accordance with my sincere belief.”

Le PRESIDENT : Merci, Monsieur Andrews. J'adresse maintenant au conseil du Nicaragua, qui va vous demander de confirmer l'exposé écrit qui se trouve devant vous. Monsieur Reichler.

Mr. REICHLER: Thank you, Mr. President. Good afternoon, Dr. Andrews. May I ask you to confirm whether the three documents in front of you — that is, your summary prepared for the purposes of this hearing and your two reports prepared in the context of this case — reflect your honest expert views?

Mr. ANDREWS: There was only one report prepared for the case for me.

Mr. REICHLER: I apologize. Then, may I ask you to confirm whether the two documents in front of you — your summary prepared for the purposes of this hearing and your other report prepared in the context of this case — reflect your honest expert views?

Mr. ANDREWS: Yes, they do.

Mr. REICHLER: Thank you.

Le PRESIDENT : Merci. Je donne maintenant la parole à Monsieur Wordsworth pour le contre-interrogatoire. Monsieur Wordsworth, c'est à vous.

Mr. WORDSWORTH: Thank you very much, Mr. President. Good afternoon, Dr. Andrews. Could I ask you kindly to turn to page 2 of your report, paragraph 4, and to read the first three sentences? Sorry, not your report, your summary. I apologize.

Mr. ANDREWS: Paragraph 4?

Mr. WORDSWORTH: Paragraph 4.

Mr. ANDREWS:

“The arguments presented by Costa Rica and its experts regarding sedimentation and the impact of the Road are flawed. Some arguments present incomplete or inapposite paradigms for assessing the impact of sediment from the Road. For example, whether or not sediment from the Road is a large or small percentage of the overall total load does not alter the fact that, because the existing load is high, any additional sediment contributed by the Road will lead to deposition and require additional dredging.”

Mr. WORDSWORTH: Thanks very much indeed. And to be clear, I just want to ask you some questions about that last sentence which has just come up, again, in the further questioning of Dr. Kondolf. Could I ask you then to turn on to page 26 of your summary?

Mr. ANDREWS: The summary . . .

Mr. WORDSWORTH: Paragraph 26 of your summary.

Mr. ANDREWS: OK.

Mr. WORDSWORTH: Where you say that “[s]ubstantially all of the relatively coarse sediment transported in to the Lower Río San Juan will be deposited on the river bed within the first three kilometers”. Yes?

Mr. ANDREWS: Yes, that is correct.

Mr. WORDSWORTH: And that is the first 3 km essentially of the bifurcation between the Lower Río San Juan and the Río Colorado.

Mr. ANDREWS: That is correct.

Mr. WORDSWORTH: We have just seen Dr. Kondolf’s overall estimate of total annual sediment, we have just seen it on the screen and that total annual sediment is, deriving from the road, is between 116,000 and 150,000 cubic metres.

Mr. ANDREWS: I believe that is correct.

Mr. WORDSWORTH: Costa Rica obviously says it is much lower, but let us use those figures for now. That is the prediction of the total additional sediment figure from the road, is it not? It is both coarse and suspended sediment?

Mr. ANDREWS: That is correct.

Mr. WORDSWORTH: In your report, *Annex 3* to Nicaragua’s Reply, you suggested the coarse load is perhaps 12 to 18 per cent of the total sediment load?

Mr. ANDREWS: Of the sand, of the suspended load, 12 to 18 per cent, I believe the bed load is additional.

Mr. WORDSWORTH: So when you are talking about what gets deposited in this first 3 km, it is 12 to 18 per cent of what has been washed down the river in the suspended sediment?

Mr. ANDREWS: Plus the bed load, there is two components: the relatively coarse sediment that is just swept along the bed, called bed load, and then there is some of the bed material, that is

sand, that gets suspended— all of that comes into the coarse fraction. And so, for example, in the ICE report, they estimate that 28 per cent of all sediment will be in this relatively coarse fraction.

Mr. WORDSWORTH: Right. So then we see what actually gets deposited down in this delta area and you accept, I think, that approximately ten per cent of the flow of the river and the sediment goes into the Lower San Juan and approximately 90 per cent goes into the Río Colorado? Is that correct?

Mr. ANDREWS: No, the ICE report suggests that 10 per cent of the water goes into the Lower San Juan, but 16 per cent of the suspended sediment and 20 per cent of the bed load go into it. So the water and sediment do not go proportionally into the two channels at the bifurcation. There is a higher proportion of sediment that goes into it, and that is based on their analysis and measurements.

Mr. WORDSWORTH: Yes, I am really relying on your expert views. What I have in mind is your report which was submitted with Nicaragua's Reply, where you say

“Applying the same assumptions, [these are the assumptions that Dr. Kondolf is making about sediment quantities coming from the road] as described above, namely that 10 percent of the sediment is carried into the Lower Río San Juan [and you will have to tell me where that assumption comes from in a moment] and that 12 to 18 percent of the total river sediment load is relatively coarse, 1270 to 2340 m<sup>3</sup> of sediment from Route 1856 alone, and 1390 to 2700 m<sup>3</sup> of sediment from route 1856 plus access roads will be deposited within the first 3 kilometers of the Lower San Juan”.

Mr. ANDREWS: The ICE Report of 2013, the first one that they submitted suggested that there would be a proportional division of water and sediment; that 10 per cent of the flow would go into the Lower San Juan, and 10 per cent of the sediment. The new ICE Report that was released in 2014, in December, says 10 per cent of the water and 20 per cent of the relatively coarse sediment, 16 per cent of the suspended sediment; I've just relied upon their figures. They have actual measurements. They've done the discharge measurements there. And so I have relied upon the change in their estimate of the amount of sediment, that it is a disproportionate amount that goes into the lower river.

Mr. WORDSWORTH: When you say ICE have the actual discharge measurements, ICE is a Costa Rican entity, isn't it?

Mr. ANDREWS: That's correct. And they have made discharge measurements in the Río Colorado.

Mr. WORDSWORTH: Yes, so they don't have the relevant discharge measurements, do they? Because they cannot identify what is in the Río San Juan, what goes into the Río Colorado and what goes into the Lower San Juan. They don't have the relevant data set, do they?

Mr. ANDREWS: Well they don't a complete data set, but they have the available data that is there to do an analysis.

Mr. WORDSWORTH: They have one third of the picture, don't they? They have the data of what comes into the Río Colorado. They don't have the data as to what is going along the San Juan River. They don't have the data as to what is going into the Lower Río San Juan.

Mr. ANDREWS: I believe that is correct.

Mr. WORDSWORTH: And have you not formed your own expert view as to what the split is between water flow and sediment flow?

Mr. ANDREWS: Not at that location.

Mr. WORDSWORTH: At any location?

Mr. ANDREWS: Well, at the mouth of the river and the amount of material deposited in the upper reaches of the Lower San Juan, yes.

Mr. WORDSWORTH: You've had access to flow rates and sediment depositions, so second hand-sediment measurements there, have you?

Mr. ANDREWS: I used the available information that we had and made estimates of what proportion of the sediment would be deposited based upon my experience.

Mr. WORDSWORTH: Can I ask you about this figure? This is really what I am interested in; is you're saying here in your report attached to Nicaragua's Reply, and this is page 28 of the report if you want to go to it. I have just read that out to you and it is really what you are saying about how much is being deposited within the first 3 km of the Lower San Juan. As I understand it, you're saying that the figure, including the sediment said to be coming from the access roads is between 1,390 and 2,700 cubic metres. Is that correct?

Mr. ANDREWS: Yes it is. But I think that using the revised estimates from the 2014 ICE reports, that those would be increased somewhat.

Mr. WORDSWORTH: Yes, OK. But let's take those as the figures for the moment because they are the figures in your report. And what I would like to do is to compare those figures: 1,390 cubic metres to 2,700 cubic metres, being deposited, with what is actually being dredged there. Do you recall that Professor van Rhee confirmed on Friday that in 2012, Nicaragua was dredging 176,918 cubic metres from that delta area? Do you recall that?

Mr. ANDREWS: Yes, not the specific number, but in that order of 100,000 cubic metres.

Mr. WORDSWORTH: Do you recall that he confirmed that in 2013, the amount dredged by Nicaragua was 304,000?

Mr. ANDREWS: That sounds about right, I guess.

Mr. WORDSWORTH: Likewise 2014, it was 158,000.

Mr. ANDREWS: I don't remember for the specific years, but I remember for the four-year period, it was about 700,000.

Mr. WORDSWORTH: Exactly so, and he called this, excluding the initial 90 odd thousand, I think he called this "maintenance dredging". Now you accept that the amount that on your figures is being deposited from the road in this 3 km stretch is only a tiny fraction of what Nicaragua is in fact dredging. That's correct, isn't it?

Mr. ANDREWS: It still has to be dredged and the large amount of material that they are dredging is coming from Costa Rica and is due to poor land use practices there over the last four decades from 1950 to 1990.

Mr. WORDSWORTH: We have noticed how Nicaragua's experts like to make that point. But it is not actually a response to the question I was putting which was specifically about the road, wasn't it? And is it not correct to say it is a tiny fraction — I think it is between 0.5 per cent and 2 per cent of the amount that Nicaragua has in fact been dredging from this stretch in the past three years.

Mr. ANDREWS: That's correct, and they still have to dredge it.

Mr. WORDSWORTH: In fact it is within the margin of variability that Dr. Kondolf was referring to earlier, isn't it? Well within the margin of variability.

Mr. ANDREWS: They still have to dredge it. There is uncertainty but variability doesn't mean that it is not there. We know that it gets into the river, we know that it will be transported downstream and we know that it will be deposited at this location.

Mr. WORDSWORTH: But your case, isn't it — just so I understand it — your case is simply that some small, small fraction of what is actually dredged has come from the road, you say. And that has to be dredged, yes?

Mr. ANDREWS: Yes. And we are only talking about one location. The majority of the sediment that comes from the road is being deposited further downstream in the delta.

Mr. WORDSWORTH: Absolutely, that would be the fine sediment?

Mr. ANDREWS: I guess, that would be correct.

Mr. WORDSWORTH: And again that would be a tiny fraction, wouldn't it, of what is coming from the rest of the river?

Mr. ANDREWS: It's a larger proportion.

Mr. WORDSWORTH: But we are still talking, relatively speaking, about a very small percentage, aren't we, compared to the total percentage?

Mr. ANDREWS: It is still a large amount of material and if we could . . . I think you earlier posed the issue of this room being 400 and some sq. m. and I will accept that; the Costa Rican estimate is for 44,000 cubic metres coming from the road. And that would be 100 m: the size of the room, 100 m up, one football field above us. And the higher value, that would be the 150,000 cubic metres that Professor Kondolf has suggested, that would be the area of this room, 350 m high. That's a very substantial amount of material and you can think about dredging that.

Mr. WORDSWORTH: Yes, I don't think we should be debating the question of actual material. In a sense it is not very helpful because what this case is about is significant harm. Now if sediment filling up this Great Hall is spread out over a distance of 108 km, it gets diffused, and that's the point. The question is whether it leads to significant impact. The question that I am putting to you is: given that, on your evidence, only between 0.5 per cent to 2 per cent of the amount that is actually being dredged by Nicaragua comes from the road, can that be regarded as significant?

Mr. ANDREWS: And, the assumption in your question is that it is spread evenly, and it is not spread evenly, it is disproportionally deposited in places in the channel around bars, river bars, sandbars, that are relatively shallow and have low flow. It cannot be transported anymore, it gets deposited there, and that is exactly where the navigational obstructions occur.

Mr. WORDSWORTH: Can you point to me, to any evidence on the record, Dr. Andrews, which shows that this 0.5 to 2 per cent, that comes from the road, that is deposited in the delta area, is spread out along the sandbars, or unevenly in a way that the rest of the 99.5 or 98 per cent is not?

Mr. ANDREWS: So I would not say that the other 99 per cent is spread evenly either. It is my professional experience that the deposition in a reach is not uniformly distributed, but is concentrated in particular areas, depending upon the flow, the channel curvature, changes in

channel width, that there are preferred areas for deposition within a channel and that is where the sediment accumulates.

Mr. WORDSWORTH: Right. You are not suggesting, are you, that the extra 0.5 per cent or 2 per cent, that you say comes from the road, creates a sort of tipping point? That somehow this is the straw that breaks the camel's back, are you?

Mr. ANDREWS: No.

Mr. WORDSWORTH: Thank you. And you do agree, I presume, with Professor van Rhee, when he said, looking at the pre-road situation, he is talking about 2008, this is paragraph 6, of his summary:

“Sedimentation and consequent reduced flow impedes navigation of the river. In 2008, Nicaragua’s environmental regulatory authorities concluded that sedimentation in the Lower San Juan River ‘pose[d] serious problems for navigation.’ At least 2.2 km of the stretch of river between the Delta and the Caño San [Juan] downstream was found to be very shallow [certain depths only 0.3 m], making navigation by even small vessels impossible . . . sandbars had also developed.”

The municipal authorities are saying it is predicted to get worse. Now that is all pre-road, is it not?

Mr. ANDREWS: That is what it says, yes.

Mr. WORDSWORTH: So, the point to you<sup>r</sup> is that: what is happening, this tiny fraction from the road, is not making any material difference?

Mr. ANDREWS: I think we are talking pre-road. The example you read was pre-road.

Mr. WORDSWORTH: Correct.

Mr. ANDREWS: And . . .

Mr. WORDSWORTH: That is my point . . .

Mr. ANDREWS: In talking about, or considering, obstructions to navigation, it does not mean that through a reach of a few kilometres and such that every metre would be, you would be unable to navigate your boat. All you need is an obstruction every few hundred yards, or so, and it

makes it, or you would only need one, in the entire 2 or 3 km reach. If you cannot get your boat through that one stretch, you cannot get it through. So you do not have to fill up, or we should not think of it as filling up, the entire segment. All you need is one place where there is an obstruction to navigation.

Mr. WORDSWORTH: Thank you. I am just trying to explore with you whether you can pinpoint anything that comes from the road, that is creating that particular obstruction. And so far as I understand your answer, you can say generally sediment creates sandbars. You cannot say anything specifically generated from the road.

Mr. ANDREWS: I think that the road sediment gets mixed with all the other sediment and contributes to the problem, the obstructions to navigation, and the additional dredging that is required.

Mr. WORDSWORTH: Thank you very much, Dr. Andrews.

Le PRESIDENT : Merci, Monsieur Wordsworth. Monsieur Reichler, conseil pour le Nicaragua, souhaitez-vous procéder à un interrogatoire complémentaire ? Si ce n'est pas le cas, ne vous déplacez pas. Si c'est le cas, je vous donne la parole.

Mr. REICHLER: Thank you very much, Mr. President. I am sorry to be slow to the podium. I appreciate the offer, but we do not see any re-examination as being necessary.

Le PRESIDENT : Merci, Monsieur Reichler. Je vais donner la parole au juge Bhandari qui souhaite poser une question au professeur Andrews. Monsieur le Juge Bhandari, vous avez la parole.

Judge BHANDARI: Thank you, Mr. President. Dr. Andrews, I have a question for you.

Mr. ANDREWS: Thank you.

Judge BHANDARI: In the introduction of your expert statement, at paragraph 3, you stated that "any additional input of sediment from the road will necessarily add to the already excessive

supply of sediment, accelerate deposition, and thus require further dredging by Nicaragua”. However, in the conclusion of your statement, at paragraph 39, you write that “without frequent pre-construction sediment sampling for several years, it would not be possible to determine whether the river’s sediment load had increased and if so, by how much”. In light of these remarks and considering your expert evidence as a whole, is it fair to say that you have drawn no conclusion on the following two issues: (1) whether the construction of Route 1856 has caused any additional sediment to be deposited into the San Juan River; (2) the amount of additional dredging, if any, in the River San Juan that Nicaragua must undertake as a result of the construction of Route 1856? This is my question, please.

Mr. ANDREWS: Yes, there are two paragraphs so there is going to be two parts to the answer. The first part is — and you have seen all the photographs of the erosion and we are seeing sediment go directly into the river and we have the Costa Rican estimate about how much it is and the Nicaraguan estimate, they differ somewhat understandably — that sediment is getting into the river, a portion of it is going to go into the Lower San Juan and it is going to have to be dredged even if we cannot say specifically how much it is, it is not going to disappear or go evaporate or dissolve into the water. Once it gets into the river it will be transported down and it will eventually need to be dredged. So that is that part of the question about whether the material is getting in there. Paragraph 39 really goes to this question of saying, well you could have measured it. And this becomes somewhat technical, but let me pose it this way and it kind of follows that paragraph.

It would not have been feasible to put a gauge there in 2011 before the road had been built and measured the increase, because you would not know what to compare it to. So, if Costa Rica had said in 2000, “we are going to build a road in ten years and we are not going to do anything else in the drainage basin that will complicate the situation. Nicaragua, please put in a gauge and you can measure the effect of that road.” OK, then there would have been a baseline condition that would be well defined and not complicated by other activities within the basin. Then you could have continued that gauge and measured the post-road inputs and compared them. That is what this paragraph is addressing. By the way, this is a standard hydrological experimental approach. If they are going to build a road, or do logging or any kind of a thing, you have a period, a

pre-measurement to establish the baseline and then you do the activity, whether it's agricultural fields or logging or such, whatever, and then you can measure the post-treatment — is the usual term — impact. But without having that pre-baseline condition, and the baseline means not only you have to measure it but there cannot be other complicating factors going on; that is what this paragraph is addressing.

Judge BHANDARI: Thank you, Dr. Andrews.

Le PRESIDENT : Merci, Monsieur le professeur Andrews. Ainsi s'achève votre déposition. Je vous remercie d'avoir bien voulu comparaître devant la Cour. Vous pouvez quitter la barre. Merci.

Mr. ANDREWS: Thank you very much. It has been my privilege to appear before you.

Le PRESIDENT : La Cour va maintenant se retirer pour une pause de 15 minutes et elle procédera ensuite à l'audition du quatrième expert cité par le Nicaragua. L'audience est suspendue.

*L'audience est suspendue de 16 h 10 à 16 h 30.*

Le PRESIDENT : Veuillez vous asseoir. La Cour va maintenant procéder à l'audition du quatrième expert cité par le Nicaragua, M. William Sheate, que j'invite à prendre place à la barre.

Bonjour, Monsieur. Je vous prie de bien vouloir faire la déclaration solennelle prévue pour les experts, conformément à l'alinéa *b*) de l'article 64 du Règlement de la Cour.

Mr. SHEATE: I am sorry, I have a problem with this . . .

Le PRESIDENT : On va certainement vous aider à régler vos écouteurs.

Mr. SHEATE:

“I solemnly declare upon my honour and conscience that I will speak the truth, the whole truth and nothing but the truth, and that my statement will be in accordance with my sincere belief.”

Le PRESIDENT : Merci, Monsieur Sheate. J'appelle maintenant le conseil du Nicaragua qui va vous demander de confirmer l'exposé écrit qui se trouve devant vous.

Mr. LOEWENSTEIN: Good afternoon, Dr. Sheate. Could I ask you to confirm whether the two documents in front of you — that is, your summary prepared for the purposes of this hearing and the report prepared in the context of this case — reflect your honest expert views?

Mr. SHEATE: They do.

Mr. LOEWENSTEIN: I believe that counsel for Costa Rica will now have some questions for you.

Le PRESIDENT : Merci. Je me tourne vers le conseil du Costa Rica pour procéder au contre-interrogatoire pour lequel il vous reste environ un quart d'heure, compte tenu du temps qui a été consacré au contre-interrogatoire pour les experts qui ont précédé. Monsieur le professeur, vous avez la parole.

M. KOHEN : Merci beaucoup. I will turn to English with your permission, Mr. President. Good afternoon, Dr. Sheate.

Mr. SHEATE: Good afternoon.

Mr. KOHEN: You accept that there are some situations where it may not be possible to carry out an environmental impact assessment before works commence, don't you?

Mr. SHEATE: Indeed, there are situations where it may not be possible, given the nature of gathering the data necessary for the EIA, to be able to compile that data at the same time as having to undertake urgent activities.

Mr. KOHEN: Yes, indeed. At pages 11 and 12, paragraph 32, of your written statement you admit that “there are inevitably occasions when it is simply impossible to undertake EIA because of the need to put in place action or infrastructure *to save* lives” and, later on, according to you, next page, paragraph 35 (b), “emergency exceptions are largely limited to responses to urgent situations”. You give the example of natural disasters as an emergency exception. Another rather obvious example of an urgent situation is when a State is invaded by another State. Yes, you agree?

Mr. SHEATE: I accept that that could quite possibly be a situation where there is an emergency; I think the question in terms of an emergency exemption, in terms of EIA, is the extent to which that is a proportionate exemption given either the nature of the emergency or indeed of the particular situation.

Mr. KOHEN: And a situation of a foreign military threat would also be an urgent situation? Do you agree?

Mr. SHEATE: Quite possibly, it could be.

Mr. KOHEN: OK, thank you. So, you also accept that EIA régimes have exception clauses in relation to projects associated with national defence, don't you?

Mr. SHEATE: Indeed, yes, some EIA régimes around the world do have exemptions for projects relating to national defence.

Mr. KOHEN: OK, thank you. Please turn to Professor Craik's report contained in the folder you have in front of you, at tab 1.

Mr. SHEATE: Tab 1?

Mr. KOHEN: Yes, at pages 17 to 19 Professor Craik cites legislations from around the world including an emergency exception in Nicaraguan legislation, doesn't he?

Mr. SHEATE: Yes, he does.

Mr. KOHEN: So, even under Nicaraguan law, an EIA may not be required to be undertaken in urgent situations. Do you agree?

Mr. SHEATE: Sorry, can you repeat the question?

Mr. KOHEN: Even under Nicaraguan law, an EIA may not be required to be undertaken in urgent situations.

Mr. SHEATE: Nicaragua do indeed have an exemption provision within their EIA law as indeed do many other countries, although interestingly Costa Rica does not have an exemption provision within its own EIA legislation.

Mr. KOHEN: But you acknowledge in your report, page 27, that “Costa Rica’s exercise of an emergency exception per se is not particularly unusual”, don’t you?

Mr. SHEATE: I do. *Yes.*

Mr. KOHEN: OK, thank you. You provided an expert report for Uruguay in the *Pulp Mills* case before this Court?

Mr. SHEATE: Yes.

Mr. KOHEN: The report you produced in that case is a public document. It is at tab 2 of the folder in front of you. In that report, you stated, at page 3, at the top, that “EIA is a process not an event”, didn’t you?

Mr. SHEATE: Yes, indeed.

Mr. KOHEN: Then, in paragraph 2.4, you said: “It is important to recognize that an EIA process is just that — a process. It is not just about the production of a single report entitled ‘environmental impact statement’.” Do you still maintain this position?

Mr. SHEATE: Yes. It is important to recognize that there is a whole process to EIA, not simply the production of an environmental impact statement, or environmental impact report. Typically, an environmental impact assessment process includes a number of different stages, from screening, through scoping, through to the identification and assessment of impacts. The production of a report is a common component part of environmental assessment process, public consultation and very often, in some cases at least, monitoring the follow-up on the impacts that have been identified.

Mr. KOHEN: In that report at paragraph 2.9 you discussed various forms of EIA processes. You said one form of an EIA process may be subject to some sort of overview assessment, followed by separate EIAs or other forms of assessment, in particular you refer to transport infrastructure as an example of projects where sections come forward for consent over a very long period of time. That is the type of project at issue in this case, is it not?

Mr. SHEATE: No, it is not, because it is not a *programme de travaux*, for example — the example I used here in the *Pulp Mills* case. The distinction I think is an important one because under a *programme de travaux* then you have an overview assessment and you have separate assessments for individual sections of the road. My understanding of this particular project is that it is considered to be one project, one particular road; there has not been, as far as I am aware, any overarching plan or assessment of the whole road.

Mr. KOHEN: Is the road transport infrastructure?

Mr. SHEATE: It would appear to be transport infrastructure, I certainly would accept that, yes.

Mr. KOHEN: If I understand you well, whatever problems there may be with one document, such as an environmental impact statement, this does not *taint* a whole EIA process. Am I right?

Mr. SHEATE: Well, an environmental impact statement will reflect — or should, if it is a good environmental impact statement — the process that has gone before. So, if there has been a scoping process, for example, to identify the likely priority areas, identify the parameters that need to be considered, the impact assessment by identification and evaluation of significance, all of those elements, as well as the results of public consultation processes should be reported within the environmental impact statement. So, the environmental impact statement is a reflection — or should be a reflection — of the process that has gone before the production of that statement.

Mr. KOHEN: Only before?

Mr. SHEATE: Well, not entirely before. It will also identify as part of the environmental impact statement, it will have looked at alternatives, looked at mitigation measures that should be put in place when you come to implementing the road scheme or whatever the project is, and then it would make recommendations for monitoring the mitigation measures that are put in place in order to understand whether or not those impacts come to fruition or, indeed, whether there are additional adverse impacts.

Mr. KOHEN: So, if I understand you well, mitigation and monitoring should be integral parts of an EIA process.

Mr. SHEATE: Well, it varies according to the EIA régime.

Mr. KOHEN: Not always.

Mr. SHEATE: I am sorry?

Mr. KOHEN: Not always.

Mr. SHEATE: One might expect a monitoring programme to be included within an EIA under a generic EIA process but if you look at particular régimes, the European Union régime, for example under the current directive, or at least the one prior to the recent amendments, that has not had any monitoring requirements within the EIA directive.

Mr. KOHEN: Let me remind you what was your opinion in the context of the *Pulp Mills* case. You said, paragraph 2.14, at page 9. "Mitigation and monitoring should be integral parts of an EIA process."

Mr. SHEATE: No, I would stand by that comment. I said that mitigation and monitoring should be, my previous answer simply said that it often is not necessarily the case under different régimes.

Mr. KOHEN: Well, you went further. You say that the EIA process also requires monitoring before and after the operation begins and mitigation of any unacceptable inputs. In

your report also provided in the *Pulp Mills* case, you rejected an argument advanced by Argentina, which you described as follows: paragraph 3.8. “Argentina concludes that because they consider the original EIS [that is an Environmental Impact Statement] to be inadequate, the whole EIA process is flawed.” You rejected this argument so whatever problems with one document in that case, you argue that did not undermine the EIA process as a whole. Am I correct?

Mr. SHEATE: Well, that case is a very long time ago but if I recall correctly, there were a number of different stages to the process and a number of different stages within the Uruguayan EIA process and as prescribed by the legislation, which means that for example, in terms of consenting, where consenting and licensing for processes take place, it is not all wrapped up in one particular process. So, the environmental statement was a part of that process and then there was a separate licensing process as far as I can recall.

Mr. KOHEN: OK. So the Costa Rican mitigation works and monitoring of the road infrastructure works and all the reports produced in relation to them are part of Costa Rica’s EIA process, are they not?

Mr. SHEATE: No, it would not appear to be the case.

Mr. KOHEN: Why?

Mr. SHEATE: Because, if you are referring to the EDA document, for example, the EDA is not part of the Costa Rican EIA law, it is not defined within the Costa Rican EIA law, as I understand that environmental diagnostic assessment is a form of environmental assessment.

Mr. KOHEN: Are we talking about international law obligations or domestic obligations?

Mr. SHEATE: You were asking me in terms of whether or not the environmental diagnostic assessment, for example, was part of an EIA process.

Mr. KOHEN: In the sense of international law?

Mr. SHEATE: I would not say it was, because it does not appear to be part of a national process for environmental assessment so I do not really see how it could be seen as being part of . . . In a sense it is a stand-alone assessment. I think the clue in a way is in the term of environmental diagnostic assessment. It is simply trying to diagnose what the problems are and then prescribing remedies. It is not doing what an EIA would do, which is actually to try to prevent those impacts from occurring in the first place.

Mr. KOHEN: You wrote that mitigation and monitoring is part of an EIA?

Mr. SHEATE: Yes, but as part of an EIA, not mitigation and monitoring on its own. Mitigation and monitoring on its own, remediation on its own, is very simply trying to put a sticking plaster on a very large gaping wound. An EIA process is about trying to anticipate, predict what the likely significant effects are going to be and to take those into account in making a decision about the planning and design of the project and so what you are then looking at with the EIA is that it would be iterating with the design of the project in order to try to design out any potential adverse impacts or at least as many as possible. Quite clearly the EDA does none of that, it is quite simply seeking to remediate damage that has already been created because the road was designed without an environmental impact assessment.

Mr. KOHEN: Well, these are international law elements of the discussion that we will refer to later on. Mr. Sheate, may I ask you to turn to tab 3 of the folder in front of you. You should see a list of 22 scientific studies produced by or for Costa Rica, relating to their road. Have you read all of these studies?

Mr. SHEATE: No, I did not. I have not reviewed all of those studies.

Mr. KOHEN: So you do not have a complete picture of the EIA *components* in relation to the road? Do you?

Mr. SHEATE: No, but my remit in terms of reviewing this particular situation was to look at the extent to which the screening process for EIA had been carried out and the extent to which that was consistent with what one might expect in terms of international best practice.

Mr. KOHEN: Have you ever seen a similar road project — about 150 km — subject to this amount of scientific assessment?

Mr. SHEATE: I think most road projects would be able . . .

Mr. KOHEN: Such as ?

Mr. SHEATE: . . . I would think in terms of transport projects that I am familiar with, which would be motorway projects in the United Kingdom for example, or high-speed rail lines, many of those would have many many more documents than this in relation to scientific studies and technical annexes on environmental impact studies.

Mr. KOHEN: Can you just mention one?

Mr. SHEATE: Widening of the M25 motorway around London. The widening of the M25 around London, for example, the high-speed rail scheme.

Le PRESIDENT : Monsieur le professeur, je crois que le temps qui vous était alloué est maintenant expiré. Par conséquent, je suis obligé de mettre fin à ce contre-interrogatoire. Je vous remercie.

Je me tourne vers les conseils du Nicaragua. Souhaitez-vous procéder à un interrogatoire complémentaire ? Si oui, vous avez la parole pour la même durée.

Mr. *LOEWENSTEIN*: Mr. President, Nicaragua sees no need for re-examination.

Le PRESIDENT : Merci beaucoup. Je demande à l'expert de rester encore quelques instants à la barre car un juge souhaite lui poser une ou des questions. Je vais donner la parole au juge Bhandari.

Judge BHANDARI: Thank you, Mr. President. Dr. William Sheate, I have a question for you. Throughout your written statement you provide a number of examples of what you call international practice, whereby both the circumstances giving rise to an environmental impact assessment are described, as well as the contents of what such an assessment should include. It

would appear that your examples of international practice rely heavily on regional practice from the United States and European Union. Consequently I would like to ask you two questions based on expert professional experience:

- (1) Are you able to provide examples of international practice applicable in other regions of the world, including, but not necessarily limited to, Central and South America and/or other tropical regions?
- (2) If so, could you please indicate whether the countries that follow such practice are motivated by the belief that they are legally bound to do so?.

Mr. SHEATE: In terms of other examples, it is correct that I do rely quite heavily on the experience from both the US and the European Union and also UNECE, of course, in terms of Espoo Convention, but both the US and the European Union have been very influential in terms of informing and being used as templates for other régimes around the world. So, in terms of the way in which environmental impact assessment has been adopted around the world, many countries have adopted an approach that is more similar to, for example, the US *under the* National Environmental Policy Act. Australia, for example, Australia's Commonwealth *legislation* is very much modelled on the US, although interestingly, it also has an exemption provision but it is very narrow, a restricted exemption provision.

In terms of experience within other régimes, in terms of tropical areas, most of my professional experience is not in tropical areas and, in this context, I was asked to consider that there is a wider international perspective and not the specific local circumstances.

Judge BHANDARI: Thank you, Dr. Sheate.

Le PRESIDENT : Merci. Je donne maintenant la parole à M. le juge Bennouna.

M. le juge BENNOUNA : je vous remercie, Monsieur le président. Bonjour, Monsieur Sheate. Vous avez abordé la question de l'évaluation de l'impact sur l'environnement. Je voudrais vous poser deux questions qui sont générales, mais je vous demanderai d'être précis parce que vous êtes l'expert — donc un expert se doit d'être précis et bref.

- 1) Ma première question est la suivante : est-ce que vous pouvez concevoir cette évaluation de l'impact sur l'environnement pour cette route, étant donné sa situation, le long du fleuve, sans une consultation préalable avec le Nicaragua, avec l'autre Partie ?

Ça c'est ma première question.

- 2) Ma deuxième question : vous, en tant qu'expert, sur quoi auriez-vous concentré une telle évaluation, sur quel aspect vous paraît-il le plus important pour une évaluation dans ce type de situation ?

Je vous remercie.

Mr. SHEATE: Thank you. If I may take the first question: in terms of the environmental impact assessment for this road, could it have taken place without prior consultation with Nicaragua? I think my opinion, my professional opinion and also in terms of the experience and best practice in terms of international practice, one would expect consultation with a neighbouring country where there was likely to be a project that could have a potential impact upon the neighbouring country. So I would certainly have expected an environmental impact assessment for a road of this nature, particularly in the location that it is, within a Ramsar-designated area, and with such close proximity to a national boundary, to have involved a transboundary consultation. Certainly.

As far as the second part of the question: the focus for such an assessment in this case. The focus for an environmental impact assessment for a road of this kind would, I believe, have a scope and focus that would be not be dissimilar to many other road schemes. Road schemes will have a range of different types of impacts, both as a result of construction, but also operation. The construction obviously involves cutting forest, the creation of the highway, and the potential for pollution, for sediment, for run-offs, certainly, for spills, and so on, to get into the river, because of its proximity to the river;. But also the impact upon, given the Ramsar designation, wildlife, upon the wetlands, in particular. So the scope, in terms of the boundaries for an EIA of this nature, would not just be along the road itself, but also the areas that could be affected by the road — so those could be areas that are downstream of the road, or “downriver” if you like from the road. Also, it should focus upon operation, and I think certainly a concern in relation to the

environmental diagnostic: one of the things the environmental diagnostic assessment does not do is to consider, in any way, the operation of the road into the future. And an EIA should be looking at the project projecting into the future, and the potential consequences of the operation of the road and consequential development, and so on, that might come alongside that road.

M. le juge BENNOUNA : Je vous remercie. Ça m'éclaire. J'espère que vous éclairez la Cour de cette façon. Est-ce que, étant donné que cette route, comme vous l'avez dit, n'est pas n'importe quel projet, est *très* proche du bord du fleuve, est-ce que pour prendre les mesures préventives contre des impacts négatifs sur l'environnement, il ne faut pas qu'un certain nombre de travaux soient menés en coopération entre les deux pays ? Etant donné qu'il y a une Partie qui a la souveraineté sur l'eau, et l'autre sur terre, mais comme en l'espèce nous avons un fleuve qui est très proche, et des travaux sur terre, mais très proches de l'eau, certaines mesures préventives de conséquences négatives sur l'environnement ne nécessitent-elles pas une coopération entre les deux Parties ? Je vous remercie.

Mr. SHEATE: Thank you. Yes, I would certainly expect there to be co-operation to try to avoid negative impacts. As importantly, I think, the consideration of alternatives and the design of the project, if it had been subject to EIA, could have avoided many of the problems, the remediation that is now having to be undertaken could have been avoided by better design of the project in the first place. It could have been routed differently, for example, to try to avoid the most sensitive environments where there might be particular problems around run-off, for example. So, I think, yes, co-operation with the neighbouring country clearly is good practice in terms of transboundary environmental impact assessment.

M. le juge BENNOUNA : Merci, Monsieur Sheate.

Le PRESIDENT : Merci, Monsieur Sheate. Ainsi s'achève votre déposition. Je vous remercie d'avoir bien voulu comparaître devant la Cour et, à présent, vous pouvez quitter la barre. Merci.

Mr. SHEATE: Thank you, Mr. President.

Le PRESIDENT : Voilà qui met fin à l'audience de cet après-midi. La Cour se réunira de nouveau demain à 10 heures. L'audience est levée.

*L'audience est levée à 17 heures.*

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