

## C) Interviews

Interview with Dr. Aggarwal, Chief Medical Officer of Gas Relief Hospitals .....	27
Interview with Mr Chakrabarti, National Environmental Engineering Research Institute .....	29
Interview with Mr. Dubey, Chairman of Madhya Pradesh Pollution Control Board.....	37
Interview with Mr. Anil Gain, Engineers India Limited .....	39
Interview with Mr. Babu Lal Gaur, former Chief Minister of Madhya Pradesh .....	45
Interview with Mr. Manoj Goyal: Director of Bhopal Gas Tragedy Relief and Rehabilitation	48
Interview with Dr. Qaiser, Sambhavna Trust Clinic .....	50
Interview with Dr. Bela Shah, Indian Council of Medical Research .....	53
Interview with Dr. Shukla, Indian Council of Medical Research .....	59
Interview with Mr. Manish Singh, Comissioner of Bhopal Municipal Corporation.....	61
Interview with Dr. K. K. Singh, Indian Council of Medical Research.....	66
Interview with Mr. Yashvir Singh, Bhopal Cell, Ministry of Chemicals and Fertilizer .....	68
Interview with Dr. Sriramachari, Indian Council of Medical Research .....	75
Interview with Mr. Satish Tiwari, Local Area Monitoring Committee.....	83

## **Interview with Dr. Aggarwal, Chief Medical Officer of Gas Relief Hospitals**

**Interviewer: Matthias Stucki**

**Date: 27.12.05**

**Topic: Contamination of water and soil around the Union Carbide Factory**

.....  
The person concerning the ... Director and the Secretary, you should go and meet him.

The Director of what?

Director of... Union Carbide..... (00:15) you have to contact directly and you have to talk to Mr...

Mr. Marron?

Yes.

He is Secretary of Union Carbide?

.....  
I will talk to him, but I would still like to ask you some questions about your opinion. It is also about health problems of the people...

I am not supposed to give any kind of interview regarding all this.

So why not?

Because I am not supposed to ..... (01:19)

But I am making interviews with many different people and I would like..

You can take interview of any person, but I ..... (01:35)

No? You can tell your personal opinion about this.

No personal opinion. I can't give an interview.

Is there any other person of the Gas Relief Hospitals, who I could talk to?

I am not allowed to talk about anything.

Who says that?

I've got an order.

From who?

From the Secretary.

Okay.

All the talk and all the interviews, he will give you.

Okay. Can cou give me his contact? Phone number or adress?

255 2137

This is Mr. Marron, the Secretary? Is he from State Government?

Yes, the Secretary.

Okay, thank you. Bye.

## **Interview with Mr Chakrabarti, National Environmental Engineering Research Institute**

**Interviewer: Matthias Stucki**

**Date: 24.01.2006**

**Topic: Contamination of water and soil around the Union Carbide Factory**

We have given everything to the Pollution Control Board. If any question is there that I don't want to answer then I can tell you that. All our reports are with Madhya Pradesh Pollution Control Board and even now also we are working with them. So at this time giving any information to you, whether it is NEERI desirable or not, I always can give you a source. We can give you a source. No problem. Just tell me what kind of questions you have.

**Yes. First, what is your opinion regarding the official and unofficial reports on the contamination of groundwater and soil inside the factory site and outside in the vicinity of the area?**

Soil, we have done extensive study. Soil contamination is there. You can find it in our report. This report was submitted sometime in --- I can show you this report also. There is no problem. Regarding ground water, we did a study. We didn't find much of a contamination, but that was early. And we made a prediction using ..... that by 2000 the contaminants will come to the groundwater. So now, we have been given another project to look into that also. So we just got the money about ten days back, so our people are going over there and are going to be looking for that. Soil contamination -- I mean, without any doubt, it is there.

**Is it also outside of the factory site?**

No, these are all within the factory site. Outside we didn't get anything, didn't find any soil contamination. And it was expected also that nothing flew out of the factory except MIC. MIC is very unstable.

**And in the solar evaporation ponds?**

Solar evaporation pond, in 1991 we did some work. Yes, there is some contamination. It is a single lined pond and we were not very happy about the whole thing. Because the kind of liner etc. that was used is not going to stay for long time. So it could be a potential source for water contamination. That we do not deny. Although that was in 1991 when we did that study. We didn't find any nearby contamination. But 1991 and 2006, that is a long time -- that is 15 years. So there could be some contamination.

**So this contamination is obviously there. And then according to you, which agency is responsible for the contamination?**

No, we have to blame only UCIL. There is no other.

See, Pollution Control Boards are always slack. That is a very general observation. Because, go anywhere, they only rise up whenever there is a crisis. So if I say that they were not very .....(14:08) See the problem is that Pollution Control Board because of the – you know – very small number of staff and other problems. They cannot just go around and look into the matter in a very detailed way. They don't have the resources, either, for doing that. They are not expected to do that. It is the job of the factory, the polluter that has to look into all these

things. So obviously UCIL is responsible for that. Because they are the generator of waste and custodian of the pesticides including .....(14:40) including that experiment pesticides.....

**Is it also the responsibility of UCL to clean up the area?**

Yes. Absolutly. Polluters-Pay-Principle will be applied on that.

**But there was this agreement with the government of India and UCIL. Does this include –**

I have absolutly no idea, what kind of – you know – contract they had. But as far the international laws, and laws and everything, the polluter has to pay for it.

Okay, you don't quote me. I mean, I give you all the information, whatever I have. But while disclosing that .....(15:20) NEERI had given this information. I am not suppose to give you. So you can quote me as an anonymous person.

**Okay.**

Don't liable NEERI, don't liable. You see that person, who is having a knowledge, because we are in the passports, we have working with the ministry also. So we are not supposed to talk to anyone. I am talking to you as a student, since you are a student. So it is something like a teacher-student kind of interaction. I give you the information, which has to be discussed. Please take care of that.

**Okay.**

**What are the responsibilities of the state and central government in this issue?**

That they enforced the law. Means the land is a state subject. Water is a state subject. So it stays at State Pollution Control Board to do the ultimate – take this thing to get the ultimate job done. The ultimate job is here remediation. But then state has its own limitation, so central government will settle help them CBCD and concern ministries also. So responsibility is definitely on the state, because the state had – the whole thing was functioning in the state.

**So state government should organise the remediation and then polluter has to pay?**

Yes yes. That's how the whole thing is going on. It is not the state government alone. State government in consultation with the Ministry of Petroleum and Chemicals. You know, they have formed a task force. So the task force is looking into that, in which I am also one of the members. And we are guiding the Pollution Control Board to that thing. Ultimately State Pollution Control Board...

**And then what steps need to be taken for remediation of the ground water and soil?**

First thing is the source remediation, which they have almost done, because they have removed everything and contained in a – you know, have you gon to UCIL at any time? Have you been to there?

**Yes, I have been there.**

You might have seen that, there is a shed, where all the contaminants and pesticide contaminated soil etc. so everything has been taken.

**In this big building there?**

That is inside the building, yes. So source remediation has already been done. But we are going to look into the matter, whether really it was done or not. So maybe we will look into the matter, but as far the concern, as for the information from the State Pollution Control Board, source remediation has been done. Now, we have to do the sink remediation. So that part remains. So we can say that further pollution is not expected. Further contamination is not expected. But the question is that, how to do the remediation? So for that, they have already contacted Gujarat Pollution Control Board and Gujarat Government, because Gujarat has – you understand TSDF, right? Treatment, Storage, Disposal Facilities, that is how hazardous wastes are being treated. So they have dedicated hazardous wastes – they means Gujarat has a dedicated hazardous waste incinerator and TSD facilities. So one TSDF is coming in Indore, which is about how many kilometers away? About 150 kilometer? Something like that. So there the landfill would have been done, but this time the incineration will be carried out somewhere in Gujarat. The negotiation is taken. You can get this information from Dr. Dubey. Have you met Dr. Dubey?

**Yes, I have met him. But I didn't ask him this. But I could call him again.**

That's what I am saying. I give you the lead.

**So there is no idea like dumping in the sea or –**

No no no. Absolutly. That is all out of question.

**So there is incineration and –**

And landfill. No question of dump in the sea. That is not allowed in India and nobody does it. How to transport it to the sea? It is not – Bhopal is a landlocked area. From there to go to the sea, the nearest sea would be probably Gujarat. That is not possible.

**What is the size of the population, who's health is potentially impacted due to the ground water contamination?**

It is difficult to say. Talk to the ICMR people. Just try it now. ICMR, Indian Council of Medical Research.

**I have met them.**

There would be people, who could give this.

**They couldn't tell me.**

If they can't say, then we can't say. There be health people.

**But how many colonies or how big is the area?**

That is something, we are not handling that part at all.

**Okay. And do you think, if people have this health consequences because of drinking contaminated water, are they then entitled –**

See, the question is, first the contamination has to be established, which remains to be established. Know .....(20:35) tendency has come up with report on contamination. NEERI has been ....(20:39) around .....practical ....contamination. But we predicted, that the contamination will be there. Ok? So know, obviously, see, we have to see there is level of the chemicals, whatever is there. Pesticides. Mostly it will be formulated pesticides, which will be alphanaphthol a little bit, all those things we have to really look into. And then we come to that. Drinking contaminated water is not at all desirable. Because we have so many uncertainties. See, for example I can say compound x is certain, below .....(21:15). Compound be is also ..... But we do not know, whether they will act synergistically.....It is very difficult to go into that, unless we did some .....toxicity and genotoxicity studies. I will give you a paper on .....(21:30) on genotoxicity of the sevin and alphanaphthol. Have you seen that paper?

**No not yet. I'd be interested.**

That is a published information. That is extremely toxic. Sevin. The \_\_\_\_\_ which have been kept in drums, they are very very very toxic.

**What happens to all the chemicals, that are now in this building in the factory area?**

There are not too many chemicals. We have only wastes, okay? Because chemicals have already – that part has been taken care of. There is no make, no pollution. Whatever is there is the waste. So I told you, that disposal.. That is the only problem.

**But if the people have health problems because of contaminated water, are they then entitled for compensation?**

Yes. Yes. They will give that. Again UCIL. Because polluters pay principle will be there. Nobody has stopped them from remediating the site. Nobody has stopped them for taking care of other contamination. That.....up to the accident. The accident took place in 1984. Today we are in 2006, 22 years apart, something could have been done, so since it was not done it is their responsibility.

**What steps have been done by the government to ensure, that the affected people, they get adequate compensation.**

See, for example, the Supreme Court Monitoring Committee has instructed the government to supply drinking water to all the affected areas. So that order has already been given. So, the drinking water part has been taking care of. The health and other things still – you know – ICMR and others are doing this study. And some kind of compensation got be arranged and some disbursement of compensation has already been done. Whether everybody got it or not is a different question.

**But that was for the gas affected people. Not for the water contamination.**

Contaminated one. Nothing. Nothing has been done [yet (he said "now")].

**But that should be organised by the government?**

The government should look into that. But first we should know, that whether there is contamination. And if it is there, there is contamination, whether it causes any health affects or health impact, because of that contamination. That we have to do.

**Yes. Okay. And according to you, do you think the expertise and technology for remediation of the ground water and soil exists in India?**

Yes. Absolutely. We have all the methods to do the decontamination.

**Okay, so who which institute –**

We are working on that also.

**Neeri would work on that?**

Yes. Because the project, which I told you about, that is going to look into that matter. If there is a ground water contamination, how to remediate, whatever soil – see, if I go to TSDF if I just cannot pick up the waste and put it in TSD. Because there are certain guidelines. If, suppose the halogen concentration is beyond a certain level, then we have to pre-treat it. Before we take it to the disposal. So all those things have to be done and they are locally, that expertise, we have.

**So it should also be possible to make remediation of the ground water?**

Oh yes. Absolutely.

**About how much would that cost?**

We don't know the quanta unless certain things we know – Two things that we need to know first to do the cost. First thing is, that we must know how many million cubic metres are contaminated. We are talking now big. And if so, then what is the nature of contamination. What kind of treatment will it be? Could be anything. It could be activated carbon absorption, active oxidation processes, .....(25:35)there are 101 methodologies which we can do. So normally, what we do, we do the experimentation, then do the technologically right thing. The right thing is done based on the techno-economical feasibility. So technical I can tell you, I can purify this water of this kind. How much I am spending money, that is also important. Because this water is costing say 12 Rupees or 14 Rupees. [Shows water bottle] Now if I purify a bottle of water, which is 20 Rupees, obviously that is not techno-economical things. But if it is necessary, if by doing that we decontaminate the site, then it doesn't matter -- then we do not count that 20 Rupees and all that. We have to do it. So, depending upon the nature of the contaminants, depending on the volume of the aquifer, then the cost will be... But again it will be born by the factory. Since the company is still existing in some way.

**But is it also Dow Chemical who has to pay now?**

Yes, because once you take – see dow chemical should have done a due diligence study, which I don't know if they have done or not. But whenever there is a disputed site... or even any site, suppose I sell you this site today, you have to do a due diligence audit before you take it. Because I am not telling you, what I have buried there. Due diligence doesn't mean that you will publish all the information. It has to only show, that you have taken adequate care to see, that the land is free from all contaminants. Dow Chemical should have done it, because they are an internationally famous company and they know all these things. So we need not tell them, because if it is an obscure – some national company, they could have said that they were not knowing. But not knowing doesn't mean that you are excused.

**So now Dow Chemical is responsible as a polluter?**

Yes. As a custodian of a polluted land. So Dow has do sue probably UCIL and look into that. I don't know what kind of agreement they have. They might have an agreement, that in case there is a remediation needed, UCIL would do that. We don't know. When the transaction was made, you can find that out. You could find that out, that would be very useful, what kind of agreement they made. Dow Chemical was knowing [knew] that the site is this polluted. Because by that time we had produced three reports showing that the site is contaminated. So there is no way to say that "we did not know."

**What, according to you, has been the role of NGOs with regard to the issue of groundwater and soil contamination?**

See, NGOs are good. No doubt. Because their supervision is very important. They are supervising everything at every state. But they should not over do it. That is when there is no contamination, they should not say that there is. NGOs should not use their power, good power, to get some \_\_\_\_\_ out of the pollution. Where there is no contamination, because NGOs have their own instruments it should not be like that. Secondly thing, what NGO should allow is the transportation of the waste to the disposal site. That, NGOs are not very comfortable with. They feel, that it is still so toxic and all that. It is toxic. I am telling you, we try to... Deepa-- [in Hindi] sevin, alphanaphthanol [in Hindi]. Due to Deshwande the copy, look at the copy. Because those two, husband and wife, they are on leave. I am just trying to .....(29:26) out that paper. So .....(29:45) is toxic, there is no doubt of it. But it is not, that we can't handle it. And the apprehension, that we are going to throw it somewhere – where it's going... That is going into the sea, that it is littered on the ground. Or Gujarat will be polluted with Madhya Pradesh's pollution. Those concerns are not correct.

**But you say that they are saying there is contamination, where is no contamination.**

No, if they are saying – I am not saying they are saying that. If they are saying that, that is wrong one thing. Second thing is, that they must permit the disposal. They must allow the remediation process to continue. It should not happen that late everything is like that. Now they are saying that the waste should be exported to the U.S. I told Sarangi – I have met Sarangi. I told Sarangi, if you can do that, we are behind you. You can make that arrangement, that you take the waste back to the US. Let US handle that. We have no problem. But, if you cannot do it within an estimated time, allow us to do that. We don't want the problem to remain there forever. So there the NGOs are to work like that. If I say, I will take one year to do that, we'll give you one year. Because I was talking to him as a Supreme Court Monitoring Committee, but if you say you cannot do it, allow us to do whatever we

can. Don't say that nothing will go out of Bhopal. That is the attitude of the NGO, then we don't \_\_\_\_\_.

But NGOs are superb. They have done a very good job. I have nothing to say against that. They are really .....(31:33) and their requirements are there because first, trust in government is very low in Bhopal. And there are reasons for that. I don't blame them. Because if you look into the entire thing – have you read that book written by Dominique Lapierre? – Second ... (31:51) at every stage, you know, companies are responsible, but then if factory inspectors who are visiting, then the Pollution Control Boards, all these things, then -- see in those days there was no hazardous waste ....(32:06) I don't blame them. But normally the practice is that whenever you are in some other country, then you have to follow the norms of that country. Not the countries, which are... some of them are nonexisting. So no developed country should take advantage of that situation. This, please keep in mind, while making your report. For example of French come to Swiss. ... We expressed doubt, we said, 'why are you coming here?' We don't have a facility there in France. Would you like to take the hazardous waste back? We are giving them the conditions.

Suppose UCIL or American Government does .....(33:39). In fact they should. They should take the entire thing, because - maybe it's not an American government person, but UCIL should do. The American Government should allow that material to be disposed to that area.

...

**That are all my questions. Thank you very much.**

I don't know whether I could satisfy you, because there are certain restrictions, we can't speak..... (34:58). That is why it is not ... (35:03) about you. But if you want to quote my paper, you can do that. And say that according to one of the publications, bye these these thee, this is the thing. Because I am handling it, it's in the public domain. Whatever is in the public domain you are supposed to ....(35:18). See, I tell you the whole thing. Look at the problem. It was a hazardous industry. It was taken to our country, fine. Somebody has to do it. Whether it is US or India, somebody has to do it. And we had taken that responsibility. We did it. But because of certain unfortunate ... – we are not going to into that. I read that book. That has documented almost everything. – The accident has happened. See, uncertainty is there, everywhere. Are you a student of science?

**Yes.**

So you know about also. All accidents are result of uncertainties. Sometimes these uncertainites could be reduced by human intervention, but if we take very lackadaisical attitude towards that, obviously we will not be able to reduce the uncertainty. So the uncertainty in its own magnitude remains. And then with the reason that the accident did happen, consequences also. But then somebody has to take responsibility. I thought it could be law .....(36:33), which is the British law, which we have adopted. The liability should be .....(36:39). So somebody has to be – you should ..... the famous ..... which is ..... (36:41) called the doctrine of strict liability. The doctrine of strict liability should be enforced on the ..... I'll give you an example... and I am having lots of animals. I come to your city. I take all adequate [precautions]... to take There is an earthquake. 8.5 Richter. The tiger escapes. ....[several minutes describing the problem of having a loose tiger in Switzerland]

Since you are posessing a dangerous material, the liability is yours. No court will listen to you, that my designs, I never thought, etc., .....(38:30) could not be predicted or designed,

I never thought there is .....All these arguments are no good. So you cannot say it happened and somehow you escape and the factory inspector is responsible for that. He should have seen whether the \_\_\_\_\_ system was ok. Pollution Control Board should have \_\_\_\_\_ an industrial accident. So it could become ineffective...(38:54). But then the question becomes "who is responsible?" No one is responsible.

It has happen in your premises. It has come from your premises. It has injured me. You are the custodian of that dangerous property. So you are liable. This is the doctrine of strict liability. So the doctrine of strict liability will identify who is the person who you will give compensation. No one else will be charged. Because you cannot say, that the factory inspector, because he is a government servant, state government servant, state government should be responsible. State is responsible. I am not saying that. State is responsible for implementation. State is responsible for bringing the expertise and doing the remediation. State is responsible to find out where from the money will be generated. If need to be, state will do the litigation. Central government will do the litigation and get the money out of UCIL. See, these are the responsibilities of the state. But if you say, no, you take our money and do that. If state is unable to do all this. Right? Then the state government. So this is the situation. We will not the mistake of saying that somebody else has the responsibility. The company is the possessor of the dangerous goods, which will be liable for compensation and remediation, whatever.

**Thank you very much for the interview.**

# **Interview with Mr. Dubey, Chairman of Madhya Pradesh Pollution Control Board**

**Interviewer: Matthias Stucki**

**Date: 18.11.2006**

**Topic: Contamination of water and soil around the Union Carbide Factory**

Name: Mr. Dubey: Chairman of Madhya Pradesh Pollution Control Board.

Address: Paryawaran Parivar, E-5, Arera Colony, Bhopal-462016 (M.P.), India

Email address: [preshdubey@satyam.net.in](mailto:preshdubey@satyam.net.in)

Direct phone number: (0755)-2463143

1. What is your opinion regarding the official and unofficial reports on the contamination of ground water and soil in the vicinity of the Union Carbide factory in Bhopal?

There is contamination of pesticides in some areas. The contamination consists only of pesticides and nothing else.

2. According to you, which agency is responsible for this contamination and why?

...Union Carbide Limited India!  
And not Union Carbide America

3. According to you, what are the responsibilities of the state and central government with regard to this contamination?

My responsibility is to tell the government about the level of contamination. I cannot say what the responsibility of the government is. Fresh water should be given to the people in the contaminated area.

4. What steps need to be taken for remediation of ground water and soil?

We need technical guidance from any agency.

5. What is the size of the population, whose health is potentially impacted due to ground water contamination?

I cannot say, I cannot reply.

6. Are any of the health consequences of drinking contaminated water manifest among the residents of the communities affected by ground water contamination?

I cannot say. I am not a doctor. I don't guess.  
This should be done by the clinics.

7. According to you, are the residents of the communities affected by ground water contamination entitled to compensation? If yes, who should pay them compensation?

That is a legal question. I don't know. Union Carbide should pay.

8. What steps have been taken by the government to ensure that people affected by ground water contamination are adequately compensated?

The affected people are already getting compensation. 3'000 Krores from Union Carbide.

9. According to you, does the expertise and technology for remediation of ground water and soil exist in India?

Yes!!! Very loudly yes! If not in Bhopal, there are many building institutions in India.

10. What, according to you, has been the role of NGOs with regard to the issue of ground water and soil contaminaton?

They are only shouting, making demonstrations and nothing concrete. There are many of them.

Thank you for you assistance!

Comment by the Interviewer:

I was not allowed to use the audio recorder. So I had to take notes and write down the interview later. The words are still the same, that he used in his answers. If I have any questions I am allowed to call him again.

Date of Interview: 18.11.05

Interviewer: Matthias Stucki

## **Interview with Mr. Anil Gain, Engineers India Limited**

**Interviewer: Matthias Stucki**

**Date: 03.01.2006**

**Topic: Contamination of water and soil around the Union Carbide Factory**

What I want to tell you, just a brief introduction.

At one time the Government of Madhya Pradesh, MP -- that's where Bhopal is -- had requested EIL to do a job for them and that was to deal with the problem of hazardous waste and dismantling of the plant, which has been contaminated by the accident. At that time, we had given them some proposals and things like that. The job now came to us. However, the ground water contamination was never discussed with us. Ground water or soil, that kind of contamination was not brought to us not for any proposal for remediation and things like that. This is the brief introduction. Keep this in mind, when you are talking with me, because anything that I will say otherwise it won't be proper. Because I thought as you come such a long way and you are student, I thought I would talk to you and see, what exactly is on your mind.

**In which year was it, that the Indian Government did this request to the EIL?**

About a couple of years back. Maybe two or three years back. And we only got to know last year, that they have given this job also to somebody else.

**So is there anything happening? Or the hazardous waste is still there?**

To be very honest with you, what happens in India is nobody knows. They are doing their own thing. We don't get involved. So something has been more political than actual. We don't do public. We are doing here proposals. This is what we do for you. And if you want to give us the job, we will do. Other people don't give it that. Because there is no use. Because we earn a lot of money. We are a commercial company. We are not an NGO, who is looking on things.

**So the status at present is, that EIL has given the proposal and then nothing happened?**

Nothing? No, I think something has happened. See, there are two agencies have in this country. One is Central Government, the so called Federal Government and other is State Government. Central Government or Federal Government is the Industrial Pollution Control Board. But State Government is not.

**The proposal is about how the disposal of hazardous waste should happen?**

Yes. We would ensure, that it is implemented by international standards. And also dismantling of the affected structure, you know, pipelines, buried, or ... that they are first decontaminated and taking care. And we want to do the job with another company called RTA. We have given this proposal with them. The joined proposal was sent to them, because they are good people. They are not evil and they are kind of NGO. Not 100% NGO, but they don't profit...

**So the disposal of the hazardous, would that happen in Bhopal? Or in another place?**

Oh, it was requested that it would take place within the factory site. But recently in India, people show, that they are concerned. But actually they are not. O.K. Now, I have had lots of my education in USA. I got there for about ten years and also my training is different from what normally people can get. Anyway, so what we get, since there are a lot of people outside the factory, they would not allow to take out the hazardous waste. They don't understand it is in their interest for the waste to go out.

**So it is the people in Bhopal, who want that is stays..**

They won't let it go. The waste out. So I said best is, that land is useless, the fact is not going to come up. So best is to use that land for secure landfill and we don't have to carry the hazardous waste down and things like that. Just whatever you can do, do it. Otherwise just dump it in secure landfill, in a scientifically designed, secure landfill.

**Is this proposal available for me?**

No, because the reason is, we have given it to these people. Why don't get to Greenpeace? They probably have it. This proposal is open. It is not a secret. Vinuta Gopal. She has interacted with us. She can tell you more about this proposal and anything else. More than anybody else. We have nothing to hide. We are taking to the people.

**Have you heard about that the hazardous waste is contaminating the water in this area? There are different studies from Greenpeace and NEERI about this contamination.**

What I want to share with you is, this tragedy is more than 20 years old. Do you think anything would be left after 21 years?

**Yes, there is a lot left.**

A lot left? See, my colleague is not here. He was telling me, that they have sold this site and they have covered it with lot of things like aggregate. You must know aggregate? And things were nicely packed. And then, because it is construction material, people have removed all the top layers and things like that and used it somewhere else. So you see, how the contamination could have gone from one place to another? And so the ground water, for 21 years they have pumping out, so much rain may have gone. It may have got diluted, actually. This is my opinion, because soil contamination there may have got washed out because of rain water. It is possible.

**So you think the contamination is washed out or the chemicals are washed out into the soil?**

No, see I don't think after 21 years anything is left on ground.

**But there are thousands of tons of chemicals still there.**

But you see their report doesn't show it like that. They say there are only ..... (20:00) stored somewhere else. But the contamination that is there on the structures nobody can do anything about. Most have been washed out. And that contamination must have gone in the soil or in the water or years of rainfalls and things like that. And we don't know, there are buried pipes, how safe it is to start a remediation.

See, pipes are in the ground. Nobody knows.

**Are there no plans?**

We don't know. They don't tell anything. They don't share.

**If there is a contamination of ground water and soil, who is then the agency that is responsible for it?**

For cleaning it?

**For the contamination.**

I am sure, that is Union Carbide.

**And for the cleaning up?**

Cleaning up, first thing, what we learn is, whoever contaminates, does the cleaning. So the Union Carbide should have done the cleaning also. If they are not doing it, they should be asked to do the clean up.

**But if Union Carbide doesn't exist now, is it Dow Chemical, who should do the cleaning up?**

Somebody is there. It has not been washed out from the face of the earth. Union Carbide, if in the name of Union Carbide, doesn't exist in Indian registry, some other name, I don't know all the details, if they are a company or some other company. Dow Chemical should take care of it.

**But what are then the responsibilities of the State Government and the Central Government?**

Both, both. See, if this, there is some indication or something going on in American courts. Somebody is being compensated. Somebody is at least been, I suppose, that the government over there received some money, compensation also. If they received the money, what for they received, one must know. Whether it is for cleaning up or compensate the people, who got in the accident.

**So the government should organise everything and the polluter has to pay?**

Yes. Suppose Union Carbide or Dow they don't want to do it, but they are willing to pay for remediation, then Government should organize that.

**But so far, they are not willing to pay, so the government has to force them to pay?**

Yes. It is a big tragedy in the world. It is an international tragedy. You cannot just close your eyes and say: "Okay, forget it." ..... (23:16)

So, you cannot take two standards, one for your country and one for third world countries. That you cannot do. And if third world countries are forced, then they should be brought to criminal. See, I don't care what happened to this place, but what happened to all these people, who lost their lives, their future lives and future .....(23:45) water is gone? Somebody needs to be held responsible.

**What steps need to be taken for remediation of the ground water and soil?**

I think there is a proposal by NEERI. I understand, there is a proposal. But I don't think NEERI has got enough experience. Indian companies don't have enough experience in the pollution, the contamination of this type of area.

**So it should be an international team?**

Yes. I believe that. I believe it has to be an international team involving Indian people, because you need local people to help you out. So involve Indian people, local people. ..... you can also in the process, how the clean up is taking place.

**Many people have health problems around this area in Bhopal.....**

I have no doubt that they have, but I have not been myself visiting there, but what all I read the papers, I understand they have problems.

**And do you think they have this health problems also because of the ground water of from the gas?**

From the gas, which is all from the gas. Ground water also got contaminated, because of the accident. Before it got not contamination. So everything started with the gas. The leakage, the liquids, the gas, the gas all went up, but there are still liquids going all over the place..... (25:38). What happened to all the contaminants? ... (25:45).

**Do you think, if people have drunken this contaminated water and they have problems, because of this, should they also get compensation?**

Yes, two things as I know with the best of my knowledge. The government has tried to arrange for alternate source of clean drinking water. But the way Indians, in that area, are very poor, and not educated, sometimes the drinking water is not tell to ... the pumps out there, but they won't do that. And by doing so I am sure they are getting hurt. I am 100% sure, that they are getting hurt by drinking that water. They don't know. See in India, people don't even know which is clean water, which is not so clean water.

**But then, should they get compensation?**

Yes. Somebody should be – if they don't get compensation, the people who are not taking care, not ensuring that they have no access the polluted water, then something should be done to those people. Somebody is accountable. If you let people go without any punishment more things are go together, then they are nor serving any properly. You see, if you punish somebody for not doing their job properly, that is one thing. But the one who polluted, he is the major culprit.

**So also this compensation should be paid by Union Carbide?**

Yes. Yes. Because all these them all these problems have come. Indian Government hasn't that kind of money, they can't support normal people in the area with clean water ..... (27:48). All the ..... resources are probably not enough to keep this place..... (27:55)

**And what do you think has been the role of NGOs in this case of ground water contamination?**

They are just making sure, they are educating the people, who are there to understand their rights, what are their rights, what are the problems and that kind of things. They are not financing anything. See, money is what is important by the thing should happen. And they don't have money. Probably they are financed by some other hidden forces to fight the Government in the kinds of NGOs.

**So are the NGOs doing a good job or not?**

Oh, I would think they are doing a good job. At least educating the people and telling them this is what is wrong, this is what can happen. Definitely that is good. But I don't know how far they are involved in that compensation thing.

**Some people say, that Union Carbide and the Indian Government, they made an agreement years ago and then they paid money to the Indian Government, so now the Indian Government is responsible.**

If that is true, then I agree. If the Indian Government has already been paid....

**But people say it is not enough....**

Then the Government should ensure that it is enough. Suppose I make a deal with you today that if you give me x money and then I am responsible for it. You can go bye-bye. Then you cannot say no no no, the money you gave me is too small. Right? Once you agreed, that my penalty is so much, then that's fine.

**So this is also the fault of the Indian Government?**

Yes. Sure. Definitely.

You must meet the Principal Secretary of the State Government.

**He doesn't want to meet me.**

See, they are very clever. What they want to do? They want to send this waste to some other state in India. So they want to send this waste to Maharashtra.

**Some people also told me, the waste should be sent to a western country.**

Why would they take it? That doesn't make sense. Why not doing it here? We should do it internationally, so what we gave the proposal, that we have designed along with RTA is an international scientific proposal.

**And about how much would that cost for the whole remediation?**

I think our proposal was for... it's been so long... 16 (or 60?) lakhs of rupees? I don't know the cost. Greenpeace would know. She was with us.

**So you worked together with Greenpeace?**

No, but we are a company that doesn't mind sharing. Why should we hide?

And your proposal doesn't include the remediation of ground water and soil?

**Does this proposal also include remediation of the ground water and soil or only the dumping of the hazardous waste?**

No, they didn't want us to do the remediation. The Government strategy was, at that time, first let us get rid of this hazardous waste. See, this hazardous waste is not expensive. It is just design the land, dump everything as to the scientific norms, so that it doesn't affect the ground water any more or nothing would go in the air. This is not so expensive. But remediation of ground water and soil is very expensive.

**So this hazardous waste dump should be done very urgently, if it is not so expensive?**

This is, what Government of India wanted, but the State Government doesn't help.

**The people from State Government say, they don't have enough money, so the Central Government should pay.**

Central Government tells them, you were making money when the plant was working -- not us. Then all the benefits of the plant went to the State Government. You enjoyed the commercial thing, when the plant was running. So know you should pay.

**Thank you very much for the interview.**

## **Interview with Mr. Babu Lal Gaur, former Chief Minister of Madhya Pradesh**

**Interviewer: Matthias Stucki**

**Date: 02.12.2005**

**Topic: Contamination of water and soil around the Union Carbide Factory**

The Interview starts after 15 Minutes.

What is your opinion regarding the official and unofficial reports on the contamination of ground water and soil in the vicinity of Union Carbide factory?

So not the gas issue, but the contamination of ground water and soil.

Union Carbide was manufacturing a Gas named Sevin, MIC Sevin. They manufactured this gas for killing the creatures...

Insecticide yes...

But this is not true. The gas factory should not be constructed near city. Bhopal is capital. It should definitely must be situated out of city in a forest or any other place. Not in the populated area. Thousands of people are living there and are affected which is very hazardous. And in the night of the leakage of MIC Gas on that 2nd December 1984. People could not understand. And that time there was maybe marriages due to Hinduism, this is time, December. Today is second December and when we are ... (18:07) near the Union Carbide

So, according to you, which agency is responsible for the contamination of water?

Union Carbide. Union Carbide is fully responsible. And Government of India, also. Central Government and M.P. government. Because they had to research about this. What kind of material are made in the factory and what did they use of that material. They should have seriously consider this. But no one knows... this is first factory in India of Union Carbide. And that made very huge losses of human beings, animals, and children. All the water resources of that area of Union Carbide was badly affected.

So what do you think, when Union Carbide is responsible, but Union Carbide doesn't exist any more, so is Dow Chemical now responsible?

They have purchased. Dow Chemical purchased. They are not ....(19:30). They are only taking the parts and other materials. They are not doing ..... (19:40). And they..... taken..... (19:43) from the Union Carbide. Only the materials they have purchased from that company.

What do you think are the responsibilities of State and Central Government, now?

The Government of India is responsible to compensate all the people of Bhopal, 56 wards.

Compensate only the gas affected people or also the people who have drunk the contaminated water?

All the people, who are living in 56 wards of Bhopal and municipal corporation area. They are all affected. Some are injured, but all are affected. Because they have the water, the air,

the vegetables. So all people are affected. In 36 wards was compensated, that was affected. And in 20 are not given because they are out of area. But this is not correct. ....

Painting a picture:

This is Bhopal of 56 wards. And the time is 1984.

Number one, number two, number three, number four. Number one is affected, number two, three, four is not affected, five is affected regarding to that .And this is also. This is the Union Carbide... If the air is bad, then everybody is affected! How can be, Number one is affected and two, three, four is not affected?! Number 56 is affected, 39 is not affected. This is not regarding to certificate. If you are settling in this area and the hazard gas came, then you are affected, because you.... The lung..... This is not correct. So this is a .....(22:35) So we demand, that all of us should be compensated.

**What steeps are need for remediation of the ground water and soil?**

The Government of India should help and aid to provide all kinds of money for the support of people. In 1985 partly went positive... Central Government that they would take care. But they are not taking care. Five years they are not taking care.

**So you think, that the Central Government should make the remediation of groundwater and soil?**

Yes. Because they have huge force. And State Government not has so much huge force. They have right to print notes, currency. We have no power to print.

**And who should pay for the remediation?**

The Central Government should give the aid to the State Government. And State Government carry out the provision of water.

**So you don't think that Union Carbide should pay?**

Union Carbide paid the whole amount, according to the agreement. We cannot morally clean/claim [??].

**But paid Union Carbide only for Gas or also for water contamination?**

Central Government and Union Carbide made an agreement of thousands krores of a dollar and also the Supreme Court. So once you have agreed, then it is finished.

**What is the size of population of people who are affected by the contaminated ground water?**

Six localities near the Union Carbide factory, they are more affected.

**How many people are there?**

10'000 People. More than 10'000.

**And do you think, are any of the health consequences among the people in this area because of the ground water?**

Yes, many kind of health problem. Gas, eyesight, heart, weakness....

**Do you think the people who are only affected by the ground water, who came later to this area and now are affected by contaminated water, they should also be compensated?**

Yes. Yes.

**What steps has the government already done, that the people get compensation?**

They have found a court, claims court. By the Claims Courts within 35'000 every person of 36 wards. And there are three category; A,B,C. Injured, more injured, and dead. They have given four categories. Deadd, they will get more than three lakhs, four lakhs, Heavy injured, they will be given one lakh and less injured 50'000 and the affected 25'000.

**But this is not for people, who are affected by the ground water...**

**Do you think the expertise and technology for remediation exists in India?**

We have good technology in India. Central Government has more knowledge and power. That should be done by our own government.

**What do you think is the role of NGOs in this issue?**

Some are doing very well. But some are not doing well, according to the wishes of the people.

**Which one are doing well and which one not?**

Some are the agents of the American capitalists. And some are enemies of Union Carbide. So they are making a wrong impression. Some are taking a good place to work but not all are good.

**Can you tell an example?**

That is very very difficult.

That is all. Thank you very much for the interview.

# **Interview with Mr. Manoj Goyal: Director of Bhopal Gas Tragedy Relief and Rehabilitation**

**Interviewer: Matthias Stucki**

**Date: 18.11.2006**

**Topic: Contamination of water and soil around the Union Carbide Factory**

Name: Mr. Manoj Goyal: Director of Bhopal Gas Tragedy Relief and Rehabilitation  
Address:

Emailaddress:

Direct phone number: 942 51 91 001

1. What is your opinion regarding the official and non-official reports on the contamination of ground water and soil in the vicinity of the Union Carbide factory in Bhopal?

Investigations on soil and water contamination have been carried out several times by competent scientific bodies. Reports are available in this regard.

2. According to you, which agency is responsible for this contamination and why?

Union Carbide Limited India, may be because of improper water management at the time of operation.

3. According to you, what are the responsibilities of the state and central government with regard to this contamination?

At present State Government as well as Central Government has been taking necessary action to clean the area and waste material disposal in a scientific manner. The works are properly guided by High Court and Supreme Court India.

4. What steps need to be taken for remediation of ground water and soil?

Necessary scientific body has been working on it. Parts of remedial measures have already been taken under the supervision of scientific body.

5. What is the size of the population, whose health is potentially impacted due to ground water contamination?

Almost 15 to 20 thousand population have been settled surrounding of Union Carbide factory area on Government land.

6. Are any of the health consequences of drinking contaminated water manifest among the residents of the communities affected by ground water contamination?

Bhopal Gas Tragedy Relief and Rehabilitation Department, Government of Madhya

Predesh have started mobile health clinics in these locations. Moreover a morbidity survey is being carried out to see the pattern of morbidity in these locations. Moreover all the Gas Relief Department's hospital are also very near these areas. People are attending hospitals for treatment.

7. According to you, are the residents of the communities affected by ground water contamination entitled to compensation? If yes, who should pay them compensation?

No comment can be made in this regard..

8. What steps have been taken by the government to ensure that people affected by ground water contamination are adequately compensated?

No comment.

9. According to you, does the expertise and technology for remediation of ground water and soil exist in India?

Yes, there are many technical organizations who can definitely guide us in this regard.

10. What, according to you, has been the role of NGOs with regard to the issue of ground water and soil contaminaton?

Many NGOs working in these areas are very much concerned about such issues. I personally appreciate their concern about human kind.

**Thank you for your assistance!**

Comment by the Interviewer:

I gave the questionnaire on the 16.11.05 to Mr. Manoj Goyal and got it back on 18.11.05. So these answers are as Mr. Manoj Goyal wrote them.

Date of Interview: 18.11.05

Interviewer: Matthias Stucki

## **Interview with Dr. Qaiser, Sambhavna Trust Clinic**

**Interviewer: Matthias Stucki**

**Date: 25.01.2006**

**Topic: Contamination of water and soil around the Union Carbide Factory**

What is your opinion regarding the official and unofficial reports on the contamination of groundwater and soil in the vicinity of Union Carbide?

See, basically, there is no report at all. The only studies are made by Sambhavna or environmental organisations from the area. They found out that there is high heavy metal contamination in the soil and water near Union Carbide. And those mothers who are... heavy metals in the contaminated water, they are also secreting this metal -- lactating mothers they are.. the milk is contaminated.....(01:47) That drinking water there .....(01:50) contaminated ..... heavy metals, that heavy metals .....

So in the milk of women?

Yes... reaches the fetus.....(02.00).

So according to you, which agency is responsible for this contamination?

Of course Union Carbide.

So you think if Union Carbide doesn't exist any more, is Dow Chemical responsible now?

Of course. They are responsible for this, because they have taken over from Union Carbide.

And what are the responsibilities of the state government and central government?

Of course they should try their best for the rehabilitation of the people, who are living in the vicinity of Union Carbide. But people are helpless. They are not helping the people of Bhopal in a proper way.

What steps not to be taken for remediation of ground water and soil?

First all the garbage should be removed. The chemicals, which are inside the soil, they should also brought somewhere else. And people should get pure water from the government. Not from there. ..... that water. So we ..... pure water .....

And where should they bring the chemicals? What should happen with the chemicals in the soil?

They should be removed.

To which place?

To a safe place, where the animals and human beings will not be affected.

Who should organise the remediation?

The government has not done anything proper so far. They don't want to .....(12:32). They are helpless about the remediation. But I think some nongovernmental organisations, these Greenpeace people, they can do it.

**What is the size of the population whose health is potentially impacted due to the groundwater contamination?**

It is around 100'000 people.

**So are there health consequences because of the water contaminations, that you see with your patients?**

Of course. The people are suffering the consequences of the water contamination. Because the complaint that ..... (14:50) at that area, are not the same among the gas victims or other side of the population. So there are many complaints in this area...

**What kind of complaints?**

It is abdominal pain, diarrhea, vomiting, skin diseases, dizziness, these are the complaints.

**And do you think that these people, who are affected by the ground water contamination, are they entitled for compensation?**

Yes. I think so. Because they are not responsible for what they have done before and what has happened to the soil. They are not responsible. .....(15:48)  
They could have been...

**And who should pay for this compensation?**

Dow Chemical, because Dow Chemical has taken over from Union Carbide.....(16:05)  
take the responsibility.

**And what has the government done to ensure that the people affected by the ground water contamination, that they get compensation?**

The government hasn't done anything, so far.

**According to you, does the expertise and technology for remediation of groundwater and soil exist in India or should it be international?**

It is not existing in India. ....(16:47). Therfore I told you, Greenpeace people, that are doing .....(16:50) they know what.

**What according to you has been the role of NGOs with in the issue of groundwater and soil contamination?**

.....NGOs? Of course NGOs are working very hard for this because government is not taking any interest..... And these are very active in the support of this .....

So Greenpeace should organise the remediation and Dow Chemical should pay for it?

Yes.

Thank you very much for the interview.

## **Interview with Dr. Bela Shah, Indian Council of Medical Research**

**Interviewer: Matthias Stucki**

**Date: 04.01.2006**

**Topic: Contamination of water and soil around the Union Carbide Factory**

Have you heard about the official and unofficial reports about the contamination of ground water and soil in Bhopal?

I mean. See, if you want me to answer this question write to me officially. I have go through.... before

Is it not possible, that you answer this question....?

No, no. I need to read you questions first. Because we are doing health. We are not doing environment.

Yes, but that has to do with health a lot, of course.

No, in our country health and environment are different institutes. Of course health and environment interact. But we have handled health research, medical research. We have not handled environmental research.

Yeah, but

Okay, I can answer the questions, which I ....

So you have heard about these official and nonofficial studies about the ground water contamination? Some are made by NEERI, some are made by Greenpeace...

We get to hear of all this of course.

And do you have an opinion on this?

We are not part of that.

But you know, that there is this contamination?

We don't have concern about the contamination.

So if there is a contamination, which agency...

We don't know if there is a contamination.

Yes, but if there was a contamination, who would be responsible?

I don't know. That is an unfair question.

Why?

You are asking me, who is responsible. I am not a agency to investigate. I am a medical researcher.

Okay.

So you cannot say, what are the responsibilities of State Government and Central Government are with regard to the contamination of ground water?

No, I can't. No, we have in India, we have a Central Pollution Control Board and a State Pollution Control Board also, which is responsible.

And if there is this ground water contamination. Do you know about how many people would be affected?

No. The State Authorities would know that.

If the people health affected by the ground water, are they then entitled for compensation according to your opinion?

I cannot say my personal opinion here. We have government laws, if people are covered for compensation and if you were working on Bhopal gas, you would know more about compensation issues than I would.

What made you come to ICMR?

ICMR did some research about the health affected people about the gas. So they had a lot to do with the gas tragedy and Union Carbide.

We don't have anything to do with Union Carbide, but we have to do with the gas tragedy.

Yes, but the gas tragedy is of course related to the contamination of ground water, because it is from the same factory.

You said that. The contamination of the ground water, the gas wasn't there, when it came.

Yes, but it came from the same factory and after the gas tragedy all the hazardous waste was left there.

Have you reports to confirm that?

Yes, I have.

Reports from?

Governmental reports, independent reports.

You can have independent reports, but India is a democratic country and everybody can say anything they want.

We have reports from international experts.

International experts, so there are teams of international experts moving around.

**So you don't trust, that there is a contamination?**

I don't know. I am asking you, because you have started your whole premise on the basis that there is. And I am questioning that premise.

**Okay. I have several studies and I trust these studies.**

I wanted to know where you picked up this issue.

**The Pollution Control Board -**

Who is funding you?

Swiss University.

Swiss Federal Institute of Technology

The Pollution Control Board of Madhya Pradesh, they admit, that there is a contamination of ground water.

Have you got a report? I would like to see that.

I have spoken to Mr. Dubey. He is the Director of the MP Pollution Control Board and he said, that there are several pesticides in the ground water.

Pesticide is totally different. You were talking about Bhopal gas.

No, I am not talking about MIC. I am talking about pesticides and heavy metals.

You said the facilities of Union Carbide. Union Carbide is not pesticides.

Union Carbide produced Sevin. And this is a pesticide.

No, but when you say pesticide, in India there are any number of pesticides...

No, I am talking about -

You are talking about a specific pesticide. You are not talking about gas.

I am talking about chemicals, that come from the Union Carbide site. About heavy metals..

No, again. You are talking about chemicals, that are found in the ground water. Whether they come from..

That is of course difficult to say.

You cannot do anything..

But if it is higher in the area, that is just beside the factory site...

The factory has been closed for 20 years.

Yes, but when the hazardous waste is still there...

What are the life time what are the normal life of those wastes?

Any waste in the environment you expect for certain number of years, right? It has its own life

Yes. But they are kept in containers and with the years, they are washed out.

They are still there?

They are still there. Because nobody is removing them.

Is that right?

Yes.

Have you seen that material?

No, I am not allowed to enter the area.

I need to check on that.

Yes, you should check that. Maybe a can give you some references.

I will work that out of my own.

What do you think has been the role of NGOs in the issue of ground water and soil contamination in Bhopal?

I think in India, I am not talking about Bhopal, because I don't know the Bhopal situation. When the Bhopal \_\_\_\_\_ happened, I was not holding this chair. But again, talking in general about the country.....(10:07) system. We have several NGOs that are very active in that country. Have done good contributions to both, health and environmental issues. I am sure some of them are doing equally in Bhopal. Personally I don't know any NGO there.

Okay. Do you think for remediation, the expertise and technology, does this exist in India or should it come from a foreign country?

It really depends on what the water contamination is. I mean, the question is, is that contamination just from heavy metals, in which case yes India has the expertise to take care of that. With pesticide remediation, I don't know. I don't know if that exists. I don't know the Pollution Board's -- I think they're confidential documents, so they are not distributed at all. I don't know, if there are reports only of contaminants of metals and pesticide or if there is some specific chemical, that came out of MIC plant, bad chemical. If it is known, what chemical it is, I don't know. So I can't answer that.

**It is a mixture of everything.**

Yes.

**So, I think that is all, that I can ask.**

..... (11:50) That was mainly focus.

**Yes. And why did the study stop in 1994?**

We followed up for ten years. And then the State Government took over. You must understand in India health is a state subject, like in the US. Federal Government and ..... (12:19) county and State. We gave over to the state. The states have to do that (12:28) center and ..... Research. The activities haven't stop. It is just that, it was transferred over because we are the research institution and manage to do research. We don't implement programme activities. We only do research and handle with the findings of the government to take of .....(12:46) That's what we did. We did the research about what is the morbidity and the mortality and we have information to act upon that.

**I will have a look on that.**

This questionnaire of your, I don't think any of this questions refer to us. Most of it is for the State Government to look at. And the gas department. You should meet somebody there. That is basically, where people should answer to these questions.

[Dr Shukla:] What is the item of the theses, which has, I don't think of the .....(13:50) collecting information is a secondary information, based on the ..... (13:54) that the ....(13:58).

[Dr. Bela Shah:] Not even secondarily, it is just opinion.

[Dr. Shukla:] It is just opinion, you are asking and you say, that the response to, the officially response to the environmental problems caused by the Union Carbide factory in Bhopal, India. This is not the correct way to estimate the ....(14:10). First thing is to estimate, that the ground water, which you have is

[Dr.Bela Shah] No that for, he has to basically talk to the Central Pollution Control Board. Your whole premise is based on the fact, that there is an environmental contamination.

**Yes.**

I am not - This agency- I am not talking for me – This agency is not the agency to be able to give you this information. We are a separate agency. Unless that agency tells me that there is something, and we would like you to respond. Not that we think of .....(14:48)

**So, if I could prove it from the Pollution Control Board, that there is a contamination from the Union Carbide site, then you would be able to give more information?**

No. I don't mean that. What I mean is, we are from the health department. You are doing the environment thing. So, I cannot comment on environment. It is not appropriate for me to comment on environment because that is not my jurisdiction.

Yes, but I am also interested in the health effects of the ground water contamination.

The questions don't relate to that.

It is about that. I am asking –

The questions you are asking about that, only the state government can answer. We are a research body. And we have done research in Bhopal. Currently we are not doing any research except on the cancer...

But in the past have you done any research about the affects of ground water or just about the gas affects?

We only studied human beings.

Yes, but –

Human beings related to morbidity, mortality and clinical signs and symptoms.....(15:54). We didn't link it to anything.

You didn't link it to anything? Okay.

It was like a case control.

That is all, we basically have to say.

Okay. Thank you

## **Interview with Dr. Shukla, Indian Council of Medical Research**

**Interviewer: Matthias Stucki**

**Date: 04.01.2006**

**Topic: Contamination of water and soil around the Union Carbide Factory**

See, basically I will explain my position. I don't have expertise in contamination of water and all those things, which you are talking about and you mention in your mail. I am basically a statistician and I am coordinating the activities of Bhopal ..... which we have for MIC. So now in ICMR, we have one institute called National Institute of Occupational Health. That is at .....(09:00). And Dr. Saiyed, who is the Director .... He is the Director of that institute. And probably he has started one or two initiatives, one or two studies about the contamination of water near the MIC plant ... this one. So he would be the best person to give you any reply on any of those technical questions which you are going to ask me. But I am not technically in that particular field.

Could you give me his contact address?

Yes.

Dr. HN Saiyed, Director, ....  
Institute of Occupational Health  
Ahmedabad  
Phone: 268 61 42  
Mobile: 98 250 154 79  
Email: [Saiyedhn@yahoo.com](mailto:Saiyedhn@yahoo.com)

But is it still possible, that I ask you some questions?

Just show me the questions. If I feel comfortable and if I know the things, then I will reply on to that. If it is something... Basically for anything we have to just take the permission from the EIC..... Chief of ..... to interview and interact with any of the foreign nationals and ask for the policy for this one. Dr. Ganguly is also not here. Dr. Bela Shah is our senior ... of non-communicable diseases. This is the chief of the non-communicable diseases. She is also gone to a meeting. Because once I got your mail yesterday, I just have given to Dr. K.K. Singh to fix up an interview for you, but at that time he is not sure if he is likely to come back. Just talk to him, whether he is available today or tomorrow.

When I called to the office of Dr. Ganguly I was sent further and further to four different doctors and finally I was sent to you.

Ok, now, see, basically that is what I am saying. One more thing, you can visit Dr. S. Sriramachari. He is in the Institute of Pathology in Delhi. He is the person, who has been associated with the MIC studies at that time in Bhopal. And he is quite more in those studies, so he can give a time and you can talk to him.

...

Tell me, what questions you have.

Have you heard about the official and nonofficial reports about the contamination of ground water and soil in Bhopal?

No, we don't.

**Yes, but there is this contamination of water and soil ....**

For that, Dr. Saiyed is a person, who has been given the responsibility last year, to carry also a study. He is in touch with the MP Pollution Control Board at Bhopal. And he is carrying also some studies. He brought some samples from there. And that is what we have.

**And if there is this contamination, which agency is then responsible for it?**

The MP Pollution Control Board.

**What do you think are the responsibilities of the Central Government and the State Government?**

No, I cannot answer that question. That is what I am saying. I am not the correct person to give you such interview. It is something related to, this one I cannot talk to you. That is what I am saying.

**But the questions about health? People around this area have many health problems, and do you think some problems are because of the ground water contamination?**

I can give a copy of the report to you, which was brought by the council. This is what you can basically use for your study purpose not for any commercial purpose. That is a technical report on health affect on MIC exposure. That contains the data from 1985 to 1994.

**But I am more interested in the contamination of ground water and spoil. That is not MIC.**

So that is the best place --- Dr. Saiyed and the ICMR institute, you have to interact with him and you can get a feedback on that.

**Do you think the people, who drink the contaminated water and have health problems are they entitled for compensation?**

All this, all the research on this, which I think is still we haven't got any finding on that. We have got some reports on that, basically on that ICMR has initiated some study. But it's still, that studies Dr. Saiyed would be the best person to tell you, what is the status of that. Either you visit him in Ahmedabad or you can write a mail to him and you can find out the things from him.

So I just give a copy of the report to you. Meanwhile you talk to Dr. K.K. Singh.

## **Interview with Mr. Manish Singh, Comissioner of Bhopal Municipal Corporation**

**Interviewer:** Matthias Stucki

**Date:** 28.11.05

**Topic:** Contamination of water and soil around the Union Carbide Factory

Typewriting from the audio recorder begins after 14 min.

**What is your opinion regarding the official and unofficial reports on the contamination of ground water and soil in the vicinity of the Union Carbide factory in Bhopal?**

Look, such studies are there and then the highest court in this country – Supreme Court – has studied, what these different studies say about the water quality and the soil quality there. And the court has given a view on that and given us some direction on that. So that is a thing, we actually are concerned, about whatever these reports say. We are working to take care that, whatever the problem is been highlighted by these reports, should be actually tackled (?15.06) to this effect, that water ... if we go specifically for water contamination - people in and around the area, who were dependent on ground water there, which was found to be contaminated, should be given an alternative drinking water and water for cooking. So we are aware of that. We are working on that to come out with a permanent solution for that. And until the permanent solution, which is actually a time-taking process involves a lot of financial implications as well, awaiting that, we are taking care of potable drinking water and water for cooking through our resources -- through temporary mechanisms.

**So, I heard about there are tankers supplying water.**

Yes, I think this was my people (? 16:10). There is a specific order by the Supreme Court. The court has said that the cooperations – the State Government – has to take care of drinking water and water for cooking for all the families residing in those areas whether they are legal colonies, illegal colonies, whoever they are whatever their status be, whether they were effected by the leak in 84 or not. People who are actually staying there should be given sufficient amount of drinking water and water for cooking. And this water should be potable and should not be the ground water of that area, which was found to be contaminated. Under those directions, what we are doing is, we are supplying water through tankers. We have our own hydrants. From there – right now we have four tankers working we put stand alone tanks (17:20?) and these tanks are filled and people collect the water from these tanks for drinking and cooking.

**Yes, but I heard that people are complaining, that not all these families are getting this water.**

Yes, we have been receiving complaints from time to time. And when I was in charge there was such a complaint. Me and the mayor, who is the elected representative of the population, we met with the people directly, because when you get information through secondary resources, they have their own additions and corrections to it. So we thought we should go to that area and find out directly what was happening. There were certain problems. Definitely certain problems. The main problem was not just that the water was not reaching them. What was happening was, the area where some of these colonies have come up is actually a low lying area. And these are all illegal colonies without any development, these colonies have been settled. So they don't have that infrastructure, road network. Because if you don't have a

road, the tankers cannot come.

These were the things we are trying to take care of these problems. And you can say that the tankers don't reach. My point is, nobody else will tell me that the tanker is not reaching, but the people there, every stand hose has a small community around it, people who are dependent on that stand hose. They have a log. They certify that the tanker came and unloaded water into the tanks. And they have some kind of chart, also. So that level of monitoring, we are doing it. Some – on a particular day, there could be a problem, if there is a problem with respect to a tanker, but we also told the supplier clearly. This is through a private supply. We have auction it out to a private supplier to provide the tankers. We told them, if you have breakage or any problem with your tanker, you arrange for an alternative tanker. Otherwise we will cancel your [contract]. So that has also been done to ensure that water reaches there in time and regularly.

**So how can the water get there, where no roads are?**

There are roads. What I am saying is, you don't have .... (neckil 20:25) roads. You have (gatcha ?) roads. So during the raining season, it becomes a problem. Some roads also may be the areas which had actually didn't have any access, we have made roads there.

**According to you, which agency is responsible for the contamination?**

I'm not an expert... There are so many studies, they actually know what the problem is and they have said the leakage and the chemistry or the chemical engineering behind it, whatever it is, but I am not an expert to be able to give you an answer, who is responsible for the contamination.

**And what do you think, are the responsibilities of the State and the Central Government?**

I don't think I can say anything on that. I don't think I can answer this question.

**Why?**

Because, this thing happened in '84.....

**No, the contamination started already before....**

After '84... before '84 also something must have happened. I also have engineering background, right? I am engineer from this plant, instrumentation engineer. Some contamination must have happen before '84. Some has happened after '84. To be exactly pinpoint when it happened and what are the..... You cannot pintpoint at what particular point of time this actually happened. But your general awareness tells you, that after the leakage, the contamination could have been higher. I don't know. There must be some studies, which will prove this or whatever. Now, what were the agencies who were supposed to take care that this doesn't happen? Right, there are certain agencies. As a concerned citizen of the..... the local public representatives also have responsibilites that if this was happening, they should have brought it out to the people, brought it out through their different platforms available to them, be it corporation, be it legislature. Then the media also had a role. If this was happening, they should have gone after it and actually reported it. So to exactly pintpoint State Government, Central Government, public, public representatives, it is actually everybody's problem. Everybody is responsible. What ever happened in Bhopal, it should not have happened.

**And what do you think, what steps need to be taken for remediation of groundwater and soil in this area?**

I think that's a very technical one.

**But do you think there should be remediation?**

If it is possible, there should be, whatever it costs.

**But you cannot say, if incineration or landfill....?**

It is a very technical thing. Only technical people, people from Pollution Control Board, People from environmental sciences, environmental engineering sciences, these people can actually come to solutions. But ground water contamination, I don't think we will be able to take care of it. I actually don't have an example, come across any example, where this has happened. The thing is, that we should forget about ground water for a period of time. We should give them pipe water supply to this area. So that they are not dependent on that ground water.

**Do you know, what is the size of the population, who's health is potentially impacted by the ground water contamination?**

We have 14 colonies there.

**How many people is that?**

Last time we surveyed that, it was around 25'000. It should have gone up, because people are coming in. There is a lot of open area. So people actually – land is a problem. Bhopal is a growing city. People are moving in from rural areas.

So people are coming in and settling there. This is where we don't actually have this piped water supply. Other areas, ground water contamination could be there, but there you have piped water supply. So that takes care of that. So again exactly you cannot pinpoint.

**And the other thing is, there are several health problems of the people in this area. Do you think they are because of the ground water contamination or because of other reasons?**

Water does affect your health. There could be a relation between this. But this can be told exactly to you by a doctor or medical practitioners, who are working with those people. What kind of ailments will come up.

**And you think, that people who are affected by the ground water, are they entitled to compensation?**

Compensation payment in the time that their health has been affected, should be taken care of. Because of loss of jobs and we should try and give them an alternative self-employment kind of schemes and train them in some matter so they can actually earn their [own living].

**And who should pay this?**

Government should be paying for it. We should be paying for it. Government is actually

doing all this. Its not that we are not doing it. We are not focused to these people itself, we have lot of schemes which actually take care of this things.

**You don't think that Union Carbide or DOW Chemical should pay compensation payment for the people there?**

They have the primary responsibility. When we go to that other area, where compensation was paid by Union Carbide – whether that package includes this or not – as far as I can remember it, it is not a part of that.

**I think this was only for the gas affected people.**

Yes, who were affected then, not the people who were affected of the after-effects of the gas. So, this is a good point. They should also be compensated.

**What steps have been taken by the government to ensure, that the people affected by the ground water contamination, are adequately compensated?**

We have a separate Department looking after that, which is the Gas-Affected-People-Department, to look after gas affected people. I refer you to him for this matter. That Department is taking care of lot of things. We are just like Municipal Corporation is into this drinking water and other services in these areas, we are doing it. But all the health related, compensation related things or other things -- a separate department has been taking ...by the Government, which is looking after that. They could be able to give you more details and all this.

**Do you think that the expertise and technology for remediation of the area exists within India?**

If it is available in India, we can do it. And sure there must be certain things that we should be able to do in India. We have a lot of good institutes and we have people, who have worked in such areas. But if something is required to be brought from outside the country, then sure -- it should.

**What according to you has been the role of NGOs in this case?**

I have been in Bhopal only for the last three, three and a half months, and have been working in different areas, but I have been following what has been happening there. It is a mixed thing. Some NGOs have done good work and some have done not good work.

**What did they do right, what did they do wrong?**

Look, there are certain NGOs, who actually have taken a big [role] and trained these people and some NGOs have given these people a voice in different fora. It is a good thing. There are certain NGOs, who have been trying to please this people also. There is a lot of compensation money, we get to know, that other people are trying to form these things. Such things also keep on coming.

**And which NGOs are these?**

That, the police should tell you. Actually I am not going to.....

**Or can you tell me what NGOs have done good things?**

I told you, I have worked for three and a half months. I don't have much interaction with these people, I am not the person, who has been here for long. But that is what my general impression from whatever I have been reading, whatever I have been finding by talking to people. So that is a very general observation, not a very specific one.

**Thank you very much for the interview.**

## **Interview with Dr. K. K. Singh, Indian Council of Medical Research**

**Interviewer: Matthias Stucki**

**Date: 04.01.2006**

**Topic: Contamination of water and soil around the Union Carbide Factory**

As Mr. Ganguly is not here, is it possible that I can ask some questions to you?

No. I am very unauthorized person. So I know, where the things are. You know Dr. Saiyed? They are doing something. That is one of our institutes.

I know.

So I cannot ask you some questions?

No. I am not expert in this field.

But nobody seems to be an expert here.

You don't need to be an expert, you can just tell me what you think. And if you don't know you can just tell me that you don't know and it's ok.

I do not know. It is not ethical, if I do not know anything.

You must know something about Bhopal. Everyone in India knows about Bhopal.

What is the purpose of doing this? Do you have Government of India clearance for this? When someone is coming and doing some study here, one is required to have some Government of India clearance?

Why?

Can I go in your country and do the same thing?

Everything is open. But I am asking you something, whether you have done it or not?

No.

That is a crime. You are doing this study without clearance.

I can do in my free time whatever I want. If I am not publishing it.

You have to go to your own country to get clearance. If I want to go to your country they will ask me many questions. Tourist permit means not doing a study.

Well, I am leaving soon.

\*\*\*\*\*



## **Interview with Mr. Yashvir Singh, Bhopal Cell, Ministry of Chemicals and Fertilizer**

**Interviewer: Matthias Stucki**

**Date: 05.01.2006**

**Topic: Contamination of water and soil around the Union Carbide Factory**

There are several official and unofficial reports on the contamination of ground water and soil in Bhopal. What is your opinion on that?

Yes, there are certain reports, which have been prepared by various governmental institutes and certain other private institutes also. You are in ..... with the geophysical research and environmental concerns..... So they have undertaken some studies and at different points of time different levels of contamination has been reported by that. Some of the chemicals and other material, which was supposed to be dumped in one of those solar ponds over there and the Union Carbide Corporation was in operation – you know - ..... the plant in Bhopal

But is this not still in there?

I don't know the latest studies, what is on finding on the latest studies. As far as we are concerned, this department is concerned, we are not directly looking on these aspects, because that is a concern of the Ministry of Environment of the Government of India.

So, obviously, there is a contamination?

Yes, the reports, they suggest, that there has been a contamination.

According to you, which agency is responsible for this contamination?

Responsible for the contamination is Union Carbide, the company which was at that point of time operating the plant. They are responsible for the contamination.

But if Union Carbide doesn't exist any more, is now Dow Chemical responsible?

Technically, if you say, maybe. But there are certain things, which have to be looked into the proper perspective. This settlement, which was arrived at with the Union Carbide at that point of time in 1989, when it was finalized. At that time, the Supreme Court had directed that all future liabilities and responsibilities of Union Carbide are taken care of -- in this judgement passed by the Supreme Court in 1989.

**And then what do you think are the responsibilities of the State Government and the Central Government?**

As far as the environmental laws of India are concerned, there is a Hazardous Waste Management Act and it has certain clause also under which these contaminated things are to be \_\_\_\_\_ by the State Agencies. So regarding to that, hazardous waste management goes the State Pollution Control Board is the agency which has to remediate the contamination -- all kinds of environmental contaminations.

**So the Central Government has no responsibility at all?**

There is a Central Pollution Control Board and of Central Government. But it monitors and advice guidance to these State Pollution Control Boards.

**What steps need to be taken for remediation of the ground water and soil?**

As far as soil is concerned, the High Court of Madhya Pradesh State has set up a task force for the purpose of remediation of the contaminated waste. So the task force has been assigned the job of monitoring the removal of the toxic material land over there and disposing of it safety. So that task force is looking into these things and since the court has set up the constitutive [?] of the task force itself, with experts of the Central Pollution Control Board, State Pollution Control Board and certain institutes, which have a spezialisation in these kind of activities, they have been cooperating in the task force and they are looking into this aspect. And they have submitted a road map into the the High Court of Madhya Pradesh, in which they have listed the activities that they will be undertaking over a period of one year.. What activities they are going to undertake for the removal and the disposal of the toxic waste.

As far as ground water is concerned, another study has been assigned too. One of the institutes is called the National Geophysical Research Institute, NGRI. This institute will study the contamination of the ground water and give a report and will also suggest measures for the identification of the contamination.

**When will this happen?**

They have collected samples from the plant site and the nearby areas also and they are also making news of the earlier reports, which are available on the ground water. Reports and they are also making their own testing and samples.

**What is the size of the population whose health might be affected by the contaminated ground water?**

There are no official as such figures I would say, of the exact number of people, who are

affected. What we got to know is, that the people who are staying in the nearby areas surrounding the abandoned plant site, they are being affected. But the State Government has made provision of safe drinking water for them, to supply of safe drinking water trough tankers and also may pipelines for supply of drinking water. So the actual number of the persons affected, I do not know what it is.

**But just about....?**

There is a lot of floating population in that area. They are not such authorized colonies, some of them are also unauthorized colonies. People have come and they have constructed small huts and basically slum kind of a thing. So the exact number we do not know. I can't say.

**If the people are affected by the ground water contamination, are they entitled to compensation?**

Compensation issue is something, which relates to ----- compensation as such it as far as ground water is concerned it's not been given in monetary terms, not in money terms. Instead the State Government, which is responsible for supplying safe drinking water to all the citizens, has made arrangements for supply of safe drinking water through these tankers and new pipelines.

**So there should not be any other compensation like as with the gas victims?**

Apart from what they are already getting?

**Yes, but some people might not be affected by the gas, they might be affected only by the ground water. These people would get no compensation?**

No, but the State Government has strictly told them not to use the ground water for drinking purpose. And some of those wells and hand pumps, which have been installed over there, they have been earmarked not to be used for drinking purpose.

**But I think, the water supply of the State Government started one year ago? Or at least only recently. There were many years, when there was no water supply. In these years all the people drunk the poisoned water.**

Yes.

**So they should not get any compensation, if their health is affected?**

If there is a relation between the consumption of the contaminated water and related diseases or some kind of physical deformity they have had, they can.

**Then who should pay for this compensation?**

That's a very good question. The responsibility for the contamination also lies with the Union Carbide. This contamination is not due to any other factor apart from the toxic waste which was left behind at the plant. .... (16:38) because rains come every year. And in that part of India, when the monsoon arrives, it forces it again. So all those chemicals and other toxic materials they all got released into the soil. So this contamination of water has taken place. If you say, that who is responsible, then the responsible agency is very clearly the Union Carbide.

**So now in these days it would be Dow Chemical?**

Yes.

**According to you, does the expertise and technology for remediation of the ground water and soil exist in India or should it be from a foreign country?**

In fact, the institutes which are engaged in the studies and who have been assigned this work of testing and all, they are institutes of the theory and they are affiliated to the Central Council of Scientific and Industrial Research, CSIR, which is the ..... (18:02) agency as far as Government of India is concerned. All scientific research and .... (18:12) These institutes, they are related to CSIR, which is a well known body to all the world as far as expertise is concerned. And they have a very good association with a lot of international agencies.

**So these institutions could work out a plan for the remediation together with other institutions from other countries?**

If required they can, if required, but we can't decide on that.

**And according to you, what has been the role of NGOs in the issue of ground water and soil contamination?**

Those NGOs have been raising this issue time and again. And they have been very vocal and they have been very, I would say, active in this sphere. They have been raising this issue not only with us, but also with the State Government. But as far as the Central Government is concerned these subjects, which are decided as far as the constitutions of India is concerned, the subject of providing safe drinking water to the citizens is under the domain of the State Government. So the State Government has to ensure, that safe drinking water is available to the people residing in those localities. But I must give credit to the NGOs for the role they are

playing. In raising this issue time again and the Supreme Court of India has also intervened in this matter, it has set up a monitoring committee, which has, in fact as you are mentioning, just one year ago it has all started. So the orders of the Supreme Court and the State Government has been forced to make arrangements for supply of safe drinking water.

**So you think the NGOs have done a good job?**

They have, yes.

Yes, and one question, that is a bit beside of this. I have heard about the strike, that happen with the doctors in a hospital in Bhopal and that several people there died. And I wondered why the Central Government didn't do anything?

But this thing was brought to the notice of the Central Government by the victims and these NGOs also. And we had told them at that very state, that the Central Government may not be able to directly intervene in affairs of this hospital. That particular hospital has been run under the control of the trust. The trust has been settled by the Supreme Court of India. And its activities are not I would not say monitored by the Supreme Court. But, whatever major policy decisions this trust makes, it always brings these things to the notice of the Supreme Court. So if anything wrong has taken place or if there has been a deadlock between the representatives of the striking doctors and technicians and other staff and the management of the hospital, then that issue can be only looked into by the Supreme Court. The Government of India directly cannot intervene in the occasion of the trust.

**If people are dying, is it not....**

If it had been any of the hospital, which is run by the State Government or the Central Government, then people have directly intervened. We could even direct the State Government to take necessary action and make all these facilities available. If the doctors of one hospital are on strike, they can transfer those patients, who can be transferred to another hospital. Otherwise, they can send some surplus doctors from other hospitals to the patients, who cannot be shifted out to other hospitals. But in this case, the situation is such, that it has become a matter of I would say procedure, the trust, the powers of the trust, they cannot be taken over by the Central Government.

Only the Supreme Court can issue certain directions to the trust.

**And the Central Government cannot do anything to the Supreme Court? Force the Supreme Court?**

I will tell you the structure of this Indian system. We have three arms described in the constitution of India. One is the legislation, judicial, and the third is executive

**Yes I know, that is how it is everywhere.**

So they are having very water type compartments, I would say, as far as their area of control and what it means is concerned. So the constitution defined certain powers and these things, duties of all these three arms of the politics. Directly we cannot go into confrontation with the Supreme Court, because if the Government of India told its Supreme Court, it means the executive or the legislation has to somehow make some kind of a ... (23:48) or sometime a petition or something of that sort to ask the Supreme Court to do something. But the Supreme Court has given powers to all citizens to approach, whenever there is a infringement of their rights. And this issue of contamination of water or this issue of I would say neglect of the patients by the hospital management, it can be looked into by the Supreme Court as far as the rights available to the citizens are concerned.

**Thank you very much for answering the questions.**

I thought that would be a very long interview.

**So, one more question: What do you think, how the remediation should be? Some people are talking about incineration of the soil or the hazardous waste, which is left over.**

There are two types of waste. One, which can be treated and then dumped in secure landfill and the level of contamination or the kind of chemicals or toxic waste is such, that if it is, like all the industrial waste. It is the practice, that the governments or the industry construct landfills and dump all industrial waste there.

**But is is very hazardous waste...**

It is, no doubt. But they are treated, all those toxic waste, all industrial waste, it is first treated for contamination, then it is dumped. This is what I have been given to understand, what it is the practice there as far as industrial waste is concerned.

**And the second part?**

The second type of waste is those ... (26:00), which are there, which contains an element of tar [?] which are still lying in the Union Carbide plant also. They are having also secure stored in those containers. And they are taken for incineration. They are the ones which cannot be taken in secure landfill, they will be taken for incineration.

**So there is no idea of dumping in the sea?**

No, there is nothing as far as the Government of India is concerned. There is no such proposal

to dump anything into the sea.

**And where would be the dump in landfill?**

The State Government has identified a site for that, in fact that is not specific to the waste, that is lying in the Union Carbide Plant in Bhopal. It's a very big secure landfill site, which has been constructed for the industrial waste of the entire state.

**Thank you very much.**

## **Interview with Dr. Sriramachari, Indian Council of Medical Research**

**Interviewer: Matthias Stucki**

**Date: 04.01.2006**

**Topic: Contamination of water and soil around the Union Carbide Factory**

I tell you. My interest has been, I am a pathologist by profession and a toxicologist because of the situation. My friend was doing toxicology work. He passed away. I joined him. I was additional ..... (03:25) of ICMR at that time. I am now 80 years of age.

And then, at the time in '84, I happened to go there along with my team and help my friend. He was doing postmortems. I joined in the postmortem work. And then developed theories of toxicology. And then made some hypotheses. Together we have done a lot of work. Theses etc. Some of these things are there. Two PhDs are help in the production of the scientific work. An enormous amount of work was done. So I am concerned with the pathology and toxicology of it. Pathology, xxxxxxxx, electromicroscopy and immediate postmortem, late postmortem, we did 150 postmortems. Quite a big work. And we examined the urine of based on my hypotheses for toxic breakdown products. Therefore, must have seen about 80'000 patients, urine examinations etc. And a few hundred patients, I also postulated that MIC does bind to haemoglobin, and later on to other tissue proteins. It's a big work. Many people don't give - Science today has become more and more impersonal and indifference and apathy happening. But this original concept that Union Carbide said MIC, if it comes in contact with water it is broken down to harmless compounds, that was their hypotheses. And then, I said, no, it cannot be. Let us find out. And then responsible for the .....(05:21) of tracking the finding of methylisocyanate. I have done a lot of work, library work.

Based on a totally unrelated event, I found, that methylisocyanate can bind with haemoglobin. That was in 1977. That is a disease called .....(05:46) and this drug was used at that time for treating of that condition. So I thought, if that is used for that treatment, let me demonstrating you. That is what I postulated. That is number one.

And then secondly, there is hydrocyanide toxicity, then that cyanide must be excreted in the urine. That is my second hypotheses.

And both my hypotheses, here were done in .....(06:14) and very .... manner. And I published many papers, last year, 2004, I published it in Current Science. An important publication of the country. And in 2004 Current Sciences, major publication of mine. Now, based on that, there have been a lot of criticism , how the design.... And fights. And the .... have done The work and the urine samples and the blood samples, I am not ....about my observation. .... ... they were now... in that studies.... That is a different story. Now, with all these things, I am aware of so many other committees, I've been member of so many ICMR committees and non-ICMR committees, Supreme Court committees. So many things were part of my duties and you say it is me. I am not an activist. I am not an NGO. And therefore, I am only a scientist. And my scientific work is a – very often it gets discredited and occasionally they are the only credits. I don't know, what your ....is. I will come to that. I am aware of other things. Like the dispersal of chemicals in the campus. Chemicals, that are in the factory, they have been left open in the campus. And that is stupidity. It is foolishness. And each other are trying to blame others rather than removing it and then talk afterwards. That is my hypotheses. Ask your question. What are the chemicals there? How many are there? Are there dumps? 20 years is long enough time for rain washing down and then contamination in the ground water. I always believe, that, why are we bothered about all this fact? Suppose you put yourself in the body of the victim, the survivors there, how much would you worry. You fortunately coming there. You are coming today. You were probably

not born at that time at the time of the Bhopal disaster.

#### I was born in 1984, in the same year.

That is what I am saying. So in other words, still you are interested. ... So even then, at that time, what happened, nobody bothered. The Union Carbide is not interested somehow..... for the whole matter. And then the NGOs, activists, they are called. They are also called activists, they are also called NGO. NGO is a condemned word. It is a respectable word. .... Since .... Therefor, my approach has been, if I were a victim and if I were survivor, I myself, what am I afraid of? What should I worry about? My lung - I am also a victim of my equipment.

Because of the postmortem exposition, I got lung problems and all that. My friend died of course. I am not dead, but ....some kinds of sick man..... It is also concentrate ..... equipment, very big equipment. No, my argument has been, if I have done postmortems, I am sick from the equipment. How many more people would be directly exposed, must be idiot? That is one thing. Second, thirdly, the question is, if water is there contaminated, how to we know, ..... (10:03) Now, for that point. If the chemicals dumps are there, they should have removed from Bhopal. Before removing, they should test the water at different geographical points radiating from the factory. From the, what is called, Union Carbide..... (10:24). And then must anually, whatever be the rate and how it is going. Everything cannot go to be there.

Everything will soak into the water. If water is soak, then how to remove it. That is one thing. How to prove it is still present is one issue. But what to do with the material, that is there? I have some radical views about it. Pick up the whole thing, put it down to a lorry and then take it to all the sea ports. And then far remove it in the Indian Ocean. Far away from any habitations, dump it.

#### In the ocean?

In the ocean! That is one of my ideas. I am not saying it is the correct one. We have to see, what chemicals are there. And therefor, from that point of view, actual remove the whole thing. Or if not, incinerate, burn it. Burn so many times. It is not an easy matter. What will be the chemicals that will be liberated(11.30) what are the risks of that, that is another issue. You can't just dump it.....

#### Which agency is the responsible to remove it? Who should remove it?

That is, the fight is still going on. It should not be like that. According to me, the government must decide, whoever pays for it, whoever compensates for it later on, first inform must the government, the lokal authority – according to me – has got any right to say, this is all dangerous material, therefore we should remove it.

#### So the State Government, not the Central Government?

No, State Government. State Government is local .....It has got the local thing and their responsibility. They may keep everybody informed. They may keep the Central Government informed. They must also take the Ministry of Chemicals. I was also associated with those naturally committees in those days. Now you can say yes, it is matter gentlemen, how should we remove it? Can we put it in water? No, it is dangerous. Can we burn it? It may be dangerous. Can we dump it out? Yes, where dump, where not in the local rivers etc. Take it away? ....far ....ocean has got so many things that, all there is still one more thing. You can encapture them and then put them in various dumps and things like that, in plastic and that is

material or something. These are the alternatives. My secret is, that none of the movements, whether it is Greenpeace or – they don't come with any practical solutions. Some analysis is done and things are okay. Now, that is one thing. Secondly, what are the chemicals? What are there normal chemicals? ..... no(13:08). Mercury had no relationship with the compounds that were traded at that time. It is an unrelated compound. Or they were they keeping it for something else. How much would have been there? Ultimately was not concentration either given sample and the distance of the earth around, x-axis, y-axis, z-axis. And what is the total amount of it? Why should there be so much? Why ..... any other chemicals? What for is mercury used? Mercury is used is used as a catalyst. It is used as a catalyst. What is need for so much mercury to be present? Was it present as mercury? Or mercurychlorate or mercurysolves? Those aspects have to be first sort out of national, international, local. For me the ground ..... (13:54) extinction and barriers of the person who .....science in general(13:56). So there must be a constant responsible group.....

**And this group should also be organised by the State Government?**

Yes, by the State Government. Because they are – who are the operating groups, who are the – that is opportunity kind – who blame them for not doing? State Government is to blame. It is convenient for me to blame you. Or you convenient to blame me. But main person, who is to do the work, is the State Government.

**And do you think, that the technology and expertise for this, is this in India or should it be international?**

No, no, how .....(14:33) getting international? But it should be available. There should be an advising ....(14:37). There must be a group. I really like to one person, I have tried to show, get the .....one gentleman with a ..... Dr. Aggarwal, he presented a good account. I was impressed by his presentation in Kanpur last year, in 2004. We had a meeting in Kanpur, celebrated 20<sup>th</sup> anniversary of the Bhopal thing. I also presented my work. But I was impressed by that gentleman's work, how to find various chemicals. There is nothing wonderful, whether you do it in Switzerland, or in Germany or in America otherwise, methodology is the same. And NEERI, Nagpur, National Engineering Research Institute, they also got facilities, if facilitites are not there, bring extra facilitites. I have come to the conclusion, have a panel, of people, experts. Have a panel of institutions, which are likely to verify. See, the.....competencies, competencies at the – I also have competence. You also have competence.

And then, we can say. This is the inventory of the chemicals. And these chemicals are very bad. That is first, to know what chemicals are there. Greenpeace and others, so many things have been done in the past. And whether it is there – they only just, each of the same to get ....(15:56) how to .....they are not .....about that. There is no compound .....(16:03) [meterisation] in such things. There must be joint effort. That's why I met various even with the so called ..... So therefore basically it is a question of detecting, finding out. And twenty years it too long the time for .....(16:23) of these chemicals. You know, in running ground water etc. So, in the process ground water has become unfit for consumption. If it is correct. Now we have to know how long it is unfit. That is even Second World War chemicals are there. So many things are there. But the people are ... all right, all over the continent, etc. So are there ..... chemicals? Chemicals that cannot be..... at all? And therefore how to identify them. Just one job. Job first is to have analytical procedures. Combined teams. Responsibility and integrity teams, they come to the conclusion, and there are for inspect the dumps. I mean the dumps, what are the chemicals there. Secondly, corporate all the job over there. It is not

chemical. How much is the concentration of the ..... suspected chemicals?

#### **Has this not already been done by several studies?**

I do not think so. As far as I know – I may not be completely knowledgeable in that as I am knowledgeable in this area. But I am telling my views about it. And more importantly we presumed that chemicals are there in the water, we prove it. First make clear, that this water contains .....(17:43)material. Then half to that, what there to do is, yes, what water should the people drink? How can they drink with this water?

#### **State Government is making water supply through tankers.**

True. From where have they brought the water? Is that water totally free of these chemicals? And then I suggested another one. Today's technology is such – our sources of water .....(18:10). Just as I told. I am having one of these, costs only quite a bit of money, by Indian standards, 60'000 Rupees. And there is another equipment. If I am using with my own money, now in the places like Bhopal, where they maybe seek identify the people, for them we must go house to house and then find the whole citizen. And nobody is doing that according to me. Everybody is trying to give newspaper, media, ....people are there. That is all that is, according to me. That is one thing important. But after that must follow item two -- namely interaction and change. If that is not done, there is no use.

Now, coming back to the chemical pollution. We must supply free water, that is toxin-free water as far as possible. And for that, just as everybody, I am sure that Switzerland, in your country, everybody has in their own house a water purifier system. It that is there, why don't you do it here? Yes, people are not – They ....(19:26) responsible maybe ignorant and things. Therefore you give for a group of houses, a street or then the sizable – for example I show you in our park here, the society has installed a water system. We all gave 5 Rupies, we get a couple liters of .....(19:34) water. And if it could be done here, what for around these millions, what for whom are you charging, whom are you accusing of, out of that money, what is the saving left and you have a series of posters, that post office boxes, you have in every street corner, that is a unit. With that variety, I told you are not the first man, maybe the 4<sup>th</sup> or 5<sup>th</sup> person I am talking to. A member of the parliament recently he wanted to clear all the .....(10:05)raises issue at parliament. I understand you are a knowledgeable person. I would like to .... You are welcome at any time, he said. There are two things.

Parliamentarians, journalists etc. are always important because they may or may not play a consulting role, but they can play certainly a distant role, a critical (?) role.. That is not as possibility. Or they have one thing easy to criticize, very .....(10:34) to put ....thought. It is difficult. I am telling you my observation. I am talking of a person who has been dead out in the lift. People, who came to the elevators to wait One hour, two hours, difficulty passing urine .....person, I remember those days, my experiences in Bhopal. I say, my dear friend, you are not even holding us in the lift in the middle. Why don't you .....(20:58) it is empty and talk across, because I am just giving this one example, right there. What is required, I don't know. I have never met Greenpeace and other people at their quarter ... India, and then World Sector of Medical Studies in Bhopal, like there are a number of groups. Yes. I like them for their enthusiasm, for there I hope there is quite a element of sincerity. But there is a general interest, publicity. Publicity is according to me to the extent a certain they brought the attention to the government. They brought the attention to the people. To caution the people, publicity is necessary. Beyond that it is not an end itself. I am not a..... If the water is contaminated, what is the contamination due to? Can the water be purified? If there are purifying systems – in Israel, they are taking the sea water and have desalinization plants and

they supply to everybody – why can't desalination or removal plants? That is the way one should work on.

**But if the State Government would organise the remediation and cleaning up of the area, according to you, do you think it is then the responsibility of Union Carbide to pay for the whole –**

No, Union Carbide has also done a clever thing. They washed their hands of this... somebody is there. Now the legality has to be – that is where the Central Government will come in, Central Government and the Courts, they .....liability of those people. I don't know whether Union Carbide is now by somebody else, because they sold it to Dow Chemicals. Those legalities, I am not an expert. That is how the people to – and sit across and then say: "My dear friends, this is the consequence of your neglect or mistake. The disaster of Bhopal, .....(22:55) leak is a separate issue. Why did you dump all those chemicals there? And why are they there? And how are they still there? They are contaminating the environment. They are contaminating the water. They are contaminating other things. Therefore we will have a fresh case against you...if at all. And for this you are not taking appropriate action. You flouted the rules existing, even legal rules existing at that time. And therefore sa a consequence we will charge you for additional damages." And then only, they will wake up. I'm just telling you... I am talking as a resident of – I am not resident of Bhopal. If I were a resident of Bhopal, I would raise these issues. And I am sorry, our institutions, societies, organisations, they are not addressing these problems. If I am wrong you can tell me, I believe in the city. You are a stranger. If I am saying wrong thing, you can tell me. What I am trying to say, in other words you are an outsider, means your are a non-involved person so far. And therefore you can have an open mind. I am interested in talking passionately from my point of view.

**So as a scientist, can you tell, you think it is probable, that the health problems, that the people have in the area, that it is also because of the water contamination? Or is it just from the gas?**

No, I won't think of it. What are the adverse effects of that? Having seen the worst condition. I have seen actually about pictures and all the photographs, hospitals empty, wards empty etc. and the hopelessness I have been there, too. Although other people have done more. My friend .....etc, they come that I realize that. They go in the city of Bhopal, the bulk of the people there are well nourished, they are fairly well ....etc. But we don't know, what is happening in the shantis, in the apartments and things like that. And therefore I suggested there should be a group, which will visit them, which will put up a notice board. If you are suffering from Bhopal disaster, you are welcome to get a check up. We must organise – nobody has ever listened to these points of mine. We will organise a lung function test. We will see your blood. We examine your various things. And we will do a periodic examination. That must be done.

**And do you think, if the people have health problems, because of the ground water, should they then get compensation?**

No, no. May not. But nothing .... the Central Government and State Government proceeding legally against them for contamination. The public health laws are the same, whether it is United States or Switzerland or India. There is enough of it. Only the will to influence them and then talk. For information, even our own lawyers never bothered to know what happened.

I was sent to America to advise other lawyers there. American lawyers brought there entry .....They are fighting the legal issue, they are not asking what exactly happened to the people. Nobody ask the questions. And I used to carry tons of studies and booklets around. So in other words, there is a dichotomy in human thinking, I would say. So that is one question. So what can be done, if the chemicals are there? Which are the chemicals? Are the chemicals likely to be handled by the –which will handle, bacteria of the soil that will try to neutralise it? And if it is persistent for 20 years, what is the latest Greenpeace data and what is today's data? Is there a decline? Or is it up?

What is the level of contamination? And is the contamination decreasing? If it is decreasing, has it gone into the ground water? ..... always give a 100% value. This is other material. But what then is leached out? Every year there is rain shower, this and that. All that will be washed off. And there are no mighty rivers there. No big mighty river, which would flood it out. And also Bhopal is so central, it can't reach the ocean so quickly. From the wells to the river, back to the ocean is a long journey to go. And therefore we have to concentrate upon the wells in Bhopal, the lakes in Bhopal. And what is, whether right or wrong, I don't believe, everything is right in the past that was analysed. These were the levels done by NEERI, by Greenpeace also, there are thousands of ....not my specialty. I am talking as a general scientist at the moment with you. I am not talking as a pathologist. I am not talking with you as a – for example I show you the papers and things like that. That is a different thing. I am not talking about microscopy to you. I am talking the leftover effect of it. We must aggregate, isolate the tank burst, whatever leak, is one event. Now, you come to ask me, what should we do? Is it a fact or not, that the chemicals are toxic? What are the consequences of that? How to trace them. How to find out if they are decreased or not. And thirdly, if they are still present there, what should we do with the dump? What should we do with the water? The issue is different.

And if water dump is there. How many are harmful? And for that, I have not got the power, not even. I would like to compare the water content of other cities' industrial areas, what is the contamination there. Then only that will give me an idea on this. If I want to do, I want to do right. To examine the urine, I brought 20 samples of urine, 50 samples and went from Bhopal to Delhi to examine with the controls of Delhi. ..... I went to villages around Bhopal, and collected urine samples. So I know, is it exposed area, unexposed area. Bhopal pressings. 25, 35, we went by Jeep and collected the samples of urine. And then came here and gave it to the Institute of ill.....(29:40), Institute of nuclear medicine. They were doing work for something else. They weren't concerned with Bhopal. They were working on something else. So I said: My friends, you seem to be more competent, why don't you analyse our samples?" And then people started saying: "Oh, he doesn't know the methods, he isn't that-". You tell what you like. I am not going to change the method once, my method is all right. I should do all the 80'000 samples with the same method. Suppose I change after 30'0000 they will say that his method was wrong. He has got doubts about his own veracity. This is all human sense. Human sense is different from science. And we have done 19'300 samples of urine. We collected in .....(30:20) 24 hour urine. Not all 20'000 I am telling. Somebody said, no, after a heavy meal, you can have something you eat, cabbage, cauliflower... and I said all right, then let us analyse 24 hour samples. So we purchased these ... And distributed a few hundreds of them, collected 24 hour samples. That is the height of it. We are as much particular as others are. People, who don't know the subject, they will criticize. I've seen it all the time. What I'm saying, if you are going to play a constructive role, what I will suggest is, everybody know how it to a wheel stuck, everybody can put a shoulder and raise the vehicle from the muddy road. Now you can also do that provided and say it has, my dear friends and ladies and gentlemen, you know my name is also Harry Potter, and I am not afraid of my name. But what I am saying is, yes, what is the extent of the existing damage in the

environment, in the dumps and in the water? And how harmful are they? What is alternative? .....(31:25) the people deserve free, safe drinking water. For the drinking water, we must have big boxes, outlets in the end of each street corner, ... not provide about it. And it will some company, which manufactures, they will be very happy. Just as oxygen carriers, this is not required for everybody. Buy a hundred... and have a ....of technician. And then of course, whoever needs a thing, if you are a registered group, you only give it to them. And then have. Don't even give them electricity. ....as a stand electrical set up. Have a cart and put it on the cart and take it....

And also as radical, as all of the .....(32:07), I am telling. If without attending this, I have talked to the the mayor of Bhopal last year in Kanpur. Can you imagine. "Oh this is a wonderful idea". And also some public, what is it called? Pollution Control Board gentleman, these were there, in the meeting, some other meeting, I mentioned just, "oh wonderful idea sir, we should ... and put on a truck."

#### **So why is he not doing it?**

Yes, that is what – No. He is only one small cow at the wheel. That is all the main point, the one thing. That the organisation are not doing. Then the High Court is unable to admit, and the Supreme Court cannot. Everybody accept going on. Let it go on. That is the attitude it. We know but there is no real urge to – everybody would like to pious talking piously, but not really pursuing the matter.

#### **Nobody wants to pay of course.**

No, no. Pay for it, the government can do. They have got the money. For your information, the money, all that is received. All of it has not been distributed.

#### **The money from Union Carbide?**

No, it is not much. It is not much really. Compared to American standard it is one tenth or so. But you will be even more surprised. I have done the research work with one of my friends. With the idea, if my urine contains more methyl isocyanate then I should get more compensation. Makes .....later. If another person – I am not ...of.....after the accident. 10 years after the accident. I said we must have the level of involvement of each one of the individuals. And this should be the mark. So and so has got 'x' units, so and so has got 'y' units, so and so has got 'z' units of the compound. Therefore those, who have 'x' units, must get proportionate compensation.

#### **And it is not happening like this?**

Never happened. You know, the point is, population is a mob thing. "hey, we are also affected, I am also coughing." And the politicians also play up to – again Saddam Husseins' kiss – You know, what I see? Ultimately the politics is contaminating everything. And therefore they say uniform the affected. So they will protest against, so called exposed areas and non-exposed areas. And in the exposed areas, we were done. All papers around that. I - moderate and severe, moderate and might affected and control areas. Ultimately, environmental politicians etc. all have they manage to get to see him .....(24:47) compensation. Dead and not dead. Dead and not dead is different from survivor, grades of severity. And apart from that. Later, I can have cancer. I can have .....(35:04). And that should be a different one. And incidently our NGOs, one of them, I may not mention the

name. They want to begin this medicine, which we found satisfactory.....indifferently forever to everybody. I said no. You need the test is positive. Then only we give.... And for that I should be stoned. Yes. "No, no, no. Everybody "- and then when I was doing that - "no, no, no, this is not the medicin, this is the procedure" another NGO brought such. A splinter broke away from NGO group. This is all tamasha. Tamasha is a hindi word. It is all fiction and imagination. There is no science in it at all. So they .....(35:54) of Union Carbide. They want to denounce. Union Carbide also recruited somebody from England, because of what all is .....(36:03) And .....these people don't know how.....(16:06). And you will be most surprised lastly. Today also I got an new theory for working on the consequences of the cyanide things, how it is to be done. I am going to go again next week to work out a project. I said, whether Bhopal has a different matter, sience is sience. There is method for breaking down methyl isocyanate into cyanate....(36:32). That is what we believe. Secondly there is ..... toxicity. It is not due to breathing..... but due to interaction of the chemicals in the body. And for that hypotheses, I got two or three theories. And believe it or not, I am, the last month, have been to .....a team of a group of people. Monday I might have a discussion with some professors, IAT. And I also said I understand, you are a knowledgeable person, I

therefore I contacted him, he said he was too busy, we are teaming up to

So there will be a new study

Yes, I'm going to start it. I will pursue the problem. After three years the question of cyanate toxicity is ....

I contacted some people in the Ukraine. I made a new theory about what is the role of the

Are you going to make new measurements in Bhopal?

No, I will give a reinterpretation.

Believe it or not, in the course of my Internet search, there are different ways of breaking down MIC.

## **Interview with Mr. Satish Tiwari, Local Area Monitoring Committee**

**Interviewer: Matthias Stucki**

**Date: 24.11.05**

**Topic: Contamination of water and soil around the Union Carbide Factory**

This is a global issue. Union Carbide is a global issue. Most of the people have attention on this particular place.

I am also concerned because I have very recently gone to the other places and a chairman to the Monitoring Committee. I have seen people using many pesticides in crops. That is also contaminationg ground water and very sensitive reptiles that have been killed because of that. This is a general problem in India. The use of pesticides is very rampant everywhere. There are also endangered species.

**What is your opinion regarding the official and unofficial reports on the contamination of ground water and soil in the vicinity of the Union Carbide factory in Bhopal?**

As a chairman of the Environmental Committee, what I have studied here, through Greenpeace and various NGO's, yes the ground water has definitely been contaminated due to the leaching of all these chemicals. The Problem is there.

**You trust both studies?**

The Problem is, that the water is not potable at all. Forget saying "potable water" -- You cannot take that water in your mouth.

**But people do!**

Well, they are helpless. The Appeals Court of India very recently has passed an order that the State Government must provide drinking water, either by way of supplying the water through tankers and the other alternative that has been given to the State of Madhya Pradesh is to provide a water pipeline there. So this is a very big burden on the government. So they do not have enough funds to give one completed, dedicated pipeline to that area. So the financial constraints are there. But the state and the other municipal authorities here are working on that. So meanwhile, the water in that contaminated area is supplied through water tankers. What I have been given to understand by the local communities and the NGOs is that there is not an adequate supply of water.

There are various reasons for it. As you know one is -- The issue of the water pipeline is a financial constraint. And the other issue is, the supply of water through tankers. The inhabitant people around the Carbide, this is all unauthorized colonies. So the normal practise is, that wherever there is unauthorized colony, the municipal facilities are not extended to that area. Most of the people, who have settled over there is, much after the Gas Tragedy. So now unknowingly they have become the victim of this water contamination. There is a lot of migration from rural area to the urban area. Seeking for employment. So people got settled over there. So there is no proper infrastructure like roads that would help to supply water. You see water tankers, they also need roads, too.

Secondly, the other problem is, during the advent of rains, when the rains are there, the roads get messy and it is difficult to get over there. They are fair-weather roads. So it is very difficult to carry water there.

So I don't say, that the government doesn't have a spirit to supply. The government does have a spirit. But financial constraints and secondly the lack of appropriate infrastructure.

**And what do you think, which agency is responsible then for this contamination?**

Definitely Union Carbide. You see it is a settled principle; polluter to clean. Here with so many public interest litigations and the Appeals Court of India, the view has been settled very well. It is polluter to pay and polluter to clean. It is only the callousness of the State Government, the monitoring agencies, the Pollution Board, so these people have not been much careful about the magnitude of the tragedy. They need a proper monitoring agency. There were monitoring agencies, but they have not been properly monitored. So it is a collective responsibility I think, of the State, the Pollution Board and definitely, you see, organisations like Dow Chemical, they are not keen on this kind of environmental remediation. That is part of the problem.

**But Union Carbide doesn't exist anymore? So do you think Dow Chemical is responsible?**

This is a corporate will. You have to xxxx such will. Deliverately to get rid to the corporate crime, the corporate responsibility, this is what has been done. The reasons are all implied [obvious]. The Union Carbide and the Dow Chemicals are hand and gloves.

**For the water supply, is the State Government responsible or central government?**  
Well, it is the State Government.

**What do you think, is there need of remediation of ground water and soil in this area?**

Environmental remediation is allready in the process. But how effectively it is to be done, the agencies involved in, most of the NGOs like Greenpeace and Sambhavna and other Organisations they are doing this .... of public interest litigation in High Court, they say that this remediation process is not an appropriate. This is not an effective.

**And what do you think?**

Well, I partly agree to it. A reason is, so far as safe landfill is concerned, no safe landfill is safe any more. Because most of the places, wherever it has been done, it has leached into the ground water. So other proposal, which most of these organisations are giving is, why not this contaminated waste has been shipped back to the polluter, back to the U.S.

(summary: This happened allready in an other case with mercury waste). So if it is the polluter to pay, the polluter to clean, why not this waste should go back to US. So this is one option. If no remediation, then it has to be excavated, packed in such a way, that they can be send back to US. Very recently was a visit from a German scientist, was an Irish Lady, they also said this proposal.

**What do you think about incineration?**

I am no basically a man from chemical engineering. But, what I have read about, that incineration is an obsolete technology again. So that also they are opposing it. So for me it is very difficult to find about it, because incineration is one issue, which is very debatable. We here in India, our scientists say, that there is nothing wrong with incineration, if it is incinerated at the temperature of 1200 degrees. 1200 degree doesn't releases dioxin. So they say, if it is below this temperature, then it is a problem. Again a debatable issue, they say, the incinerator has not been taken to that temperature.

**What do you think is the size of the population, whos health is potentially impacted due to ground water contamination?**

It is 8 – 10'000 people. Based upon this, the water supply has been made. But yes, another concern is, during the onset of every monsoon – again rains and toxic waste lies still recklessly around the Carbide. You must have seen that landfill, solar evaporation pond. You've got to see it. That is also contaminating ground water, at the onset of every monsoon. Roughly three to four kilometers it has already gone. [It has already gone roughly 4 km.]

**There are several health problems of the people around this area...**

Oh yes. But anything you need is to have a comparative study also. So the people, living in that area earlier... But very recently Sambhavna people, they are set up one ethical committee, also. The studies are going on. Yes, people say they have problems. But I am not much aware of the health status of the people living in that area.

**And do you think, if the people's health is affected by the contaminated water, ar they entitled to compensation?**

It's a very debatable issue. What I think about is, the issue is, this contamination is ever since 1979, when the first report of leakage of solar evaporation pond plant was leaked. So this is not something new. And secondly, whether the people are entitled for that compensation is not the people – what I personally think are living voluntarily in that area, and there is no municipal, identified by the Municipal Corporation in that area, but yes, since they are staying over there, they can take it as a human aspect. So definitely. Human aspect definitely demands at least, they should get a proper drinking water meanwhile some sort of alternative arrangement has to be made. People are living in the vicinity of the contaminated area. The State can take proper steps to shift them elsewhere. This remediation process is very difficult and could take another 15-20 years. Things are not very smooth and easy. The economy is very poor. The magnitude of the tragedy is very big.

**You said this is a human aspect. What do you think about the legal aspect?**

Again very debatable. There is already one classified suit in US regarding the ground water contamination. I exactly do not know the status of it. Very debatable issue. What I think, well, if people have suffered they are definitely – You see it is 100% Criminal Corporate liability of the Carbide, because you see, they have left these thousands of tons of toxic waste, is laying recklessly in and around the factory . 100% apathy and insensitivity of the Management of the Carbide. At least they do not care, that people live all around. It is just a matter of chance, that the direction of the water is going towards that side. This area was already inhabited by the permission of the local municipal authorities. So it being the factory and the leaching and the water is in that particular direction – if you go to that place lot of the borders have been sealed, because of this.

**So, who should pay them compensation?**

Very differently, I stongly believe in this my opinion is absolutely crystal clear about is, it is Dow Chemicals – the Carbide. It is a corporate crime! Well these people can spend thousands of thousands of hundereds and crores of Rupees in other kind of things, spending so much of money in litigation. And see their apathy towards the human rights. So at least some precedence has to be there.

**What do you think, is the expertise and technology for remediation of ground water and soil, does this exist in India?**

No, no, not at all! Because, you see, first reason is, the remediation is very expensive procedure and the technology involved and the most of the defaulters in this kind of environmental damage is on the multinational companies. They go scot free. Any suit of environmental degradation here in India is repugnant to the public of the US. What has happen here, if we bring this kind of suit in US, what they have done here in India, is repugnant to the interest of the people of the United States. The thing is, the technology, which we here have in India, is definitely not an adequate and it is connivance to those multinational companies here in India, who take for granted the environmental laws here. So I don't think, at least....

**So, where should you find the technology?**

We must find technology here. Not that the technical know-how is not available here in India. The problem is the spirit to have the technical know-how. There should not be any kind of the appeasement, making habit of those multinational companies to reduce the cost of the remediation. For example, when this containment of this toxic waste was going on here, cheap labour was exposed to this toxic waste. Why not there should be proper masks? To be properly covered. They are also human beings. This is the small tip of the iceberg here. In the era of globalization, we have got to learn from eachother. How do these developed countries, countries like Switzerland, Germany, France – how they are dealing with this? Because also we can have it here. It has to be an international standard for any kind of remediation.

**And what do you think has been the role of NGOs in this issue?**

Well, definitely Sambhavna has done a wonderful job. My 100% .....(27.55) goes to Sambhavna. These people have done a wonderful job. I tell you one thing: As an organization you can see Sambhavna, but this issue is a 100% one-man show. That is Satinath Sarangi. He is the person, who brought all these things into the notice of the global community, going all around, and the organizations were later followed the footprints of this man. Even the organizations like Greenpeace and all that, they came very late into this picture. But since Greenpeace International is the organization, who has enough funds, who has media management, who has the resources to reflect things globally. This man alone, alone -- 100% one-man show. You know, I am here and my whole family is a victim of the Gas Tragedy. My daughter was exposed, my wife was exposed, myself was exposed. So I have seen this man (Sathyu) working here. I am a lawyer by profession and I have seen the other legal part of this whole story.

Union Carbide is not a big issue. We must try for a better world everywhere. There are so many Union Carbides all over the world.

The blue gaps are there, where I could not understand the audio recorder.