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## Interview: David Hall

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# TVA model is being applied to flood control in China

*Over this summer, excessive rainfall and storms have led to devastating floods in China, especially along the Yangtze River. By the first week in August, 240 million people had been affected by the floods and more than 2,500 people had died. About 13.8 million people had been evacuated from their homes, and more than 5.58 million houses had been destroyed. More than 21 million hectares of farmland have been affected, and crops on 4.78 million hectares have been totally destroyed.*

*David Hall is the executive sponsor of the Tennessee Valley Authority's work in China. He was selected to head a special team to go to China a couple of years ago to explore some of the opportunities for joint work on water control, and was then asked by TVA Chairman Craven Crowell to continue to lead TVA's work with China. On May 18, the TVA signed a Cooperative Agreement with the Chinese Ministry of Water Resources for technical assistance on the development of the Danjiangkou Reservoir and the Hanjiang River. Mr. Hall was interviewed by Marsha Freeman on Aug. 14. Her article on the history of the TVA appeared in EIR, June 12, 1998.*

**EIR:** The floods in China have been in the news recently, and I know that the Tennessee Valley Authority is working with the Chinese Ministry of Water on water and flood control and development. What work is TVA doing in China?

**Hall:** The work that began under the agreement that was signed this spring is a task whereby TVA will review the master plan for the Han River. The Han is one of the largest tributaries of the Yangtze River, and the Chinese have developed a master plan for developing that river. At this point, the river is relatively undeveloped. It has only three dams on it. We signed an agreement for that work, on May 18. The first step was for us to send a technical team to see the Han River and to start collecting the data and information that the Ministry of Water Resources and others have regarding their master plan.

The team did go to China and returned two weekends ago. They were there the last two weeks in July. They had a very successful trip. They were able to get a good understanding of the Han and the initiatives and the priorities for developing the river. The next step will be for information, and data packages, to be sent to us within the next couple of months.

**EIR:** Have you seen the master plan yet?

**Hall:** We have seen a summary of the plan, but what we will be receiving is a lot of background information that went into forming the plan. We know basically where they plan to put dams and power plants on the river, but what we're going to be reviewing and assessing is all the background information that helped them to make those decisions. In addition to the plan for the river, we're helping them develop operating guides for Danjiangkou, which is a large dam and power plant at the midpoint of the Han River. It separates the upper and lower reaches of the river, so it's a very critical dam and reservoir, and they have asked us to help them come up with operating guidelines for that reservoir system.

**EIR:** The TVA's press release on the agreement mentioned that the Chinese would work alongside your experts to learn the "TVA model." What does that refer to?

**Hall:** The TVA model is an integrated regional resource development approach. It entails developing a river system by looking at all the possible uses of the water, and making sure that you optimize the competing uses of water, such as navigation, flood control, in their case, water supply for irrigation, and flood protection. They are all benefits of a river system, but they have to be balanced. In an integrated approach, you look at all of the benefits of the river and you look at your goals, and at how the watershed that the river is in can be developed. Then you optimize the way the water is utilized, which affects where dams are placed, how many dams, the sizes of the dams, navigation locks, and all of the facilities that will be built.

That's the approach that the TVA took in developing the Tennessee River. We planned it, looked at all the competing options, and then started to develop the river system from one end to the other. That model can be applied in China. There are some different uses of water there. There is much more need for water supply for irrigation, for example, in China, than there was, or is, here in the Tennessee Valley. We also have water supply from the Tennessee River municipalities and other uses here, so the model and the approach is very applicable.

**EIR:** Is the plan for extensive development of the Han River?

**Hall:** Their plan, as I understand it, would have them eventually have 13 dams on that river. The Han River is about one and a half times the length of the Tennessee River, or about



The flooding that I'm hearing about sounds like it is on the main river, the Yangtze. But the Chinese have lots of dams planned for flood control on the Yangtze. One of those is the Three Gorges project. But I just can't, without knowing which tributaries to the Yangtze precipitated the flooding, tell what impact developing the Han River might have.

In controlling flooding, you look at many things. One is the tributaries that flow into the main river. Sometimes you can alleviate flooding on a main river by constructing dams and water diversion projects on the tributaries. Depending on the configuration of the valley and the rivers, sometimes you also have to build the dams on the main river. In the Tennessee River system, we have both. A lot of our flooding is controlled by the dams that we have built on the tributaries up in the mountains. But, then, we also have downstream dams on the main stem of the Tennessee River.

The flooding in the past has been extensive in the downstream part of the Yangtze River. For example, in the Dongting Lake area, there are many rivers in Hunan province that flow into this natural lake, and one of the rivers is the Yangtze. I know that, in 1996, there was very significant flooding in the Dongting Lake area where these rivers flow in. Sometimes the Yangtze River dumps so much water into the lake, that some of those rivers actually flow backwards. The Chinese are starting now to plan flood control projects on each of those rivers, the Yangtze just being one of them.

One of the river systems that flows into Dongting Lake is the Lishui River. They have a loan from the World Bank to build the first dam in that river system, and the construction of that dam is under way. We've been asked by the Chinese to do some work, under a World Bank loan, to help them with institutional strengthening. They are starting a little company called LHPC, Lishui Hydro and Power Corp., and they want it to be modelled after TVA. We have submitted a proposal and are hoping to do consulting for them, in institutional strengthening of this new organization.

**EIR:** TVA had a very great impact not only in reshaping the Tennessee Valley, but also in managing such a large infrastructure project.

**Hall:** That's right. And when the projects were built, we had to be an organization that could plan and develop and operate and maintain reservoirs and dams and the facilities, and that's part of what we've been asked to help LHPC with. Right now they're focussed on building this new dam. Then they will build another dam and another dam, and the World Bank has asked them to become an agency that can plan and develop things and not just be focussed on designing and constructing projects. I think it's a role TVA is uniquely qualified to help them with, and we've told them that where we have staff available to do that, we would be willing to take a contract and do that consulting for them.

**EIR:** Over the past two weeks, various organizations have popped up saying Three Gorges Dam should not be built, that

money should be spent on smaller projects, shoring up dikes, and the like. One of the objections mentioned by these organizations is that engineers have not taken into account the fact that there will be a huge silt buildup behind the dam, which will raise the water level. It seems to me to be impossible that the Chinese engineers had not taken that into account. Obviously, in the United States we have built dams for 50 years or more and they work well. What do you think about ways to deal with this problem?

**Hall:** There are ways to deal with it. We have silting in reservoirs across the United States in varying degrees. A lot of it depends upon the types of terrain that the river flows through, the type of vegetation that is there. The more vegetation you have, the less erosion, and therefore the less silt coming into the reservoir. But at TVA we have a small reservoir that has silted up. It was not worth it to us to go to the expense of removing the silt and keeping the reservoir open.

In China, silting tends to be a larger problem than it is in the Tennessee Valley; we're fortunate here, in that we have lush vegetation, and TVA has taken action to reforest lots of areas, and in the 1930s, and '40s, and '50s, we were helping to change farming techniques, and lots of things prevented soil erosion, which kept us from having our reservoirs silt up. In China there is not a lot of vegetation, and there are still farming techniques that lead toward erosion. Silting is a problem any time you build a dam and slow the flow of the water. There is a tendency for sediment or silt to build up behind the dam.

There are techniques for flushing the silt through the dam, and there are ways of designing the structure to minimize the silting. There is a basic disagreement. The Chinese say, "We understand silting and we have taken it into account using the best expertise from around the world." Other people say, "No, that's really not the case." And I don't know what the real answer is. We have not been involved with Three Gorges at all, so we can't say from a technical standpoint whether they have addressed those issues, or not. They feel very strongly that they have.

**EIR:** If the Three Gorges dam were completed today, do you think it would have prevented the flooding that has recently taken place?

**Hall:** To answer that question, you would have to know where the rain fell, and what was the routing down the [Yangtze] River. I'm sure there are tributaries that flooded, as well. It's just that the Han is not in a concentrated area of rainfall, so it hasn't flooded. To see what the effect of Three Gorges Dam would be on the flooding, you'd have to see where the rain was centered, and how the water would have been routed with the dam in place.

Once you have a river system controlled, like the Tennessee River system, then we can actually go in after a storm or a period of heavy rain, and look and almost imagine what it would be like if the dams weren't there: What kind of flooding would we have had? We do that occasionally. You have to

know where there are structures, and where the precipitation occurred, and I don't know that about the current situation in China. It's pretty sad to see some of the footage of the devastation, knowing that they're considering breaking dikes in order to flood farmland and avoid flooding the heavily populated areas. Those are tough decisions to make.

**EIR:** It might give people in China a great deal of confidence that the problem can be solved, when they see what TVA has accomplished.

**Hall:** That's right. I look back at the period of the early 1900s when the Tennessee River was actually a liability to people. It caused terrible flooding, it was not navigable, there were so many rapids and shoals in it. There was rampant malaria, and disease that was actually precipitated by the river. Yet it was such a tremendous asset just waiting to be developed. We're very fortunate in this region that it was developed, and developed in a way that has sustained growth. And all of that is possible with the Chinese rivers, but it requires a lot of resources, and it takes a lot of time.

**EIR:** When do you think the Chinese will be able to say that it doesn't matter how long it rains? Will it be 15 years from now?

**Hall:** It's a longer period than that. They just don't have the resources or money now to start building dams on all the tributaries. They're quite open in saying that Three Gorges is taking a lot of resources from smaller projects. In their view, they will get more return for their investment in Three Gorges in flood control and power production, than if they built lots of smaller projects. That also is a controversial subject. Some of the opponents of Three Gorges say it would be more effective to build a larger number of smaller dams, placed on tributaries and other rivers. A lot of us haven't studied it closely enough to know if that is the case or not.

**EIR:** But the Yangtze is certainly an enormous river that must be controlled.

**Hall:** Absolutely, and the source of a lot of the flooding that the country sees today.

**EIR:** It seems that if you don't tackle the really big problem, then you could have a whole series of smaller projects that won't really produce the results you want.

**Hall:** That's a very complex question. It would be like in the 1930s, when TVA started to develop the Tennessee River. Someone looked at it and said, "some of these tributaries are just as important as building a dam on the main river." The first one that we built was Norris, on the Clinch River, which is a tributary to the Tennessee River. And we built a lot of dams on those upstream tributaries before we built the main-stream dams. But I would *never* say that because that is the way we did it, that's the right way to apply it to the Yangtze River. That is something that requires technical study, and trade-offs from a business standpoint. I'm not avoiding your

question, I'm just saying it is much more complex, than just saying it makes more sense to do it one way or the other.

**EIR:** But they are continuing to build dams on the other rivers, so it isn't true to say that they are building Three Gorges and nothing else, in any case.

**Hall:** No, it isn't. There are other projects under construction, including the Han River. There's good proof that they are looking very strongly at how to develop that entire tributary of the Yangtze. They have told us that there are other rivers that they would like us to look at and give them advice on.

**EIR:** Now you are waiting to get more detailed data from them. Then you will have people look over their plans?

**Hall:** That's right. And develop the operating guides for the Danjiangkou Reservoir. There are two points when Chinese experts will come here, and we will do some of the work jointly. On one of those trips, after we've gotten the underlying data, they will come with the plan and will present it to us, and we will make comments, suggest changes. Then, we will give them a report that either will just ratify, or reinforce their plan, or perhaps suggest changes to what they plan now. It's a 17-month-long project, starting in July when we began the work. We got a lot of the data when we were there in July, but there is more to come.

**EIR:** The Chinese have looked toward the TVA since the end of the 1930s as a model for developing their own water resources. I imagine the TVA is still held in very high regard in China.

**Hall:** It is very gratifying to be in China and meet so many people who know TVA quite well and see what high regard they do hold TVA in, especially in the area of river basin development and hydroelectric power. We appreciate the fact that we're held in high regard, so where we have the resources to help them, we're happy to do that.

**EIR:** It must be exciting to have a new series of valleys to help develop.

**Hall:** It is, and it helps us from the standpoint that we're not developing any new rivers. It's important for us to maintain our skills in that area, because things happen on our river all the time. We look at modifying the way we operate reservoirs and continue to optimize that. It can always be better. So this type of work helps our water management people to keep their skills sharp.

**EIR:** We're probably very fortunate that we have a former Senator from Tennessee as the U.S. ambassador to China [James Sasser]. He has been very supportive of the TVA being involved in China. I'm sure it has helped a great deal.

**Hall:** It has helped us. And we hope that we're helping the U.S. government. Whatever we do should be consistent with the American government's policy with China. I think it's a kind of win-win.