



## Interview with Dr. Habiba Gitay

### **BILL MOYERS**

I heard somebody on the radio the other day describe a car as a ecosystem.

### **HABIBA GITAY**

It's a good analogy because basically what we think about in nature is the animals and the plants. And yet what's really important is the interaction between the animals, the plants, and more importantly, the bacteria and the fungi, which we can't see through our naked eye. They're tiny. They're very small but they matter a great deal. So in a way, that analogy with the car is useful because you've got all the different parts but if you just look at the parts, it doesn't make a car or an engine. But when you put all those parts together and switch the ignition on — put the power through — then it works. And that's what an ecosystem is. It has loads and loads of different parts, some very tiny, some very minute. But providing it's a healthy ecosystem, it functions. And it basically provides all the goods and services that we, as humans, depend on.

### **BILL MOYERS**

Are you saying that a bug is as important as a bear in the way the forest works, or the way the ecosystem works?

### **HABIBA GITAY**

In certain times of the year, yes. Even a tiny thing like bacteria, in some ways, is far more important than a bear can be because the bacteria basically decomposes. It recycles all the material. And if you get rid of the bacteria by putting some kind of chemical on them, that ecosystem stops functioning. Whereas a bear moves on to another area during the winter or summer.

### **BILL MOYERS**

And why is that important to human beings?

### **HABIBA GITAY**

If those parts didn't function and they didn't come together, we wouldn't get our food, our water, our feed for animals because they basically recycle a lot of the pollution. They recycle the waste, and they are essential components. Ecosystems are essential components for humans. And we are part of ecosystems we well. So whatever happens to ecosystems affects us. We may consider ourselves as different entity from an animal or a plant but we are another

species on earth.

## **BILL MOYERS**

People talk about the footprint that we human beings leave on the earth. How would you describe that footprint? Is it getting larger and larger?

## **HABIBA GITAY**

If you look at a city, for example, the tentacles from the city going towards the rural areas to get the food and the water is a way of seeing how big the footprint is getting. So we may have started off within a small village — looking at cutting down the odd tree or whatever for fuel — but now with the big cities in the world, we are actually going far above, and eventually we're actually encompassing the whole of the world. We're getting a lot of our resources from different nations — from different areas of the planet — to basically keep one city going.

## **BILL MOYERS**

Is it fair to say that the earth is in trouble?

## **HABIBA GITAY**

I would say it is, and it's because of the multiple activities — multiple pressures — that humans are putting it on that's really ultimately putting it in trouble. If you just had, say, for example, climate change as one pressure because of our greenhouse gas emissions and so on, you'd say, "Okay, maybe the earth can cope," but we've also got land fragmentation. We've got habitat destruction, and therefore, biodiversity loss. We've got water pollution and so on. All of those put together are basically making our planet very, very fragile, and very susceptible to massive changes, which may result in humans disappearing from certain parts of the world. But the world in many ways may carry on.

## **BILL MOYERS**

There's certainly no guarantee that we are the ultimate act of creation.

## **HABIBA GITAY**

No, there's not. We may be the dominant species but the changes and pressures we are putting on the planet may end up acting in our own destruction.

## **BILL MOYERS**

We hear the term "loss of biodiversity" so much — what does it mean?

## **HABIBA GITAY**

Loss of the animals, plants, bacteria and fungi that keep the ecosystem functioning properly. Some of them are very important, so you lose one species and basically you can get a collapse. But sometimes you lose a hundred species, and you might not see the change. We really don't know what the key species are and what their roles are so consequently it's very, very hard to predict what would happen if you lose one species here, ten there, and so on.

## **BILL MOYERS**

What are the most disturbing signs to you?

## **HABIBA GITAY**

I think it's the massive habitat clearance that we're going through, like the deforestation. We're clearing a lot of our tropical forested areas. And that's having an impact on local indigenous communities but also on the earth as a whole because we are changing the greenhouse gas emissions.

## **BILL MOYERS**

Take a straightforward fact like this: "In the past 50 years, the world has lost a fourth of its topsoil and a third of its forest cover." What does that mean to an ordinary person walking down the street today?

## **HABIBA GITAY**

Statistics may not mean a great deal to most people, but if you imagine your house and you lose a third of your garden, that's a fairly big chunk. And if you happen to be living in those areas, then that's going to make a massive impact on you. With soil degradation, you're talking about tiny, tiny losses — a few millimeters — but it adds up to a lot of soil being lost. If that's where a lot of the bacteria and the fungi are — the tiny things that keep the ecosystem going — then you're actually losing a lot more than just that that 40 percent soil loss that you talk about.

## **BILL MOYERS**

We did a report for this broadcast on topsoil in Kansas, which is the heartland of American agriculture. In our research, we learned that since the first plow broke the soil in Kansas, the plains have lost a third of their topsoil. We don't get that back very easily, do we?

## **HABIBA GITAY**

No, we can't recreate it, especially since that third of the topsoil is where a lot of the functioning is going on for ecosystems. You basically can only get it back by putting in a lot of fertilizers, and we just don't have that much around the world to be able to do that. We do put in fertilizer, and often the phosphates and so on come from developing countries that then flow into countries like the U.S. But what's going to happen when the phosphates run out in other parts of the world?

## **BILL MOYERS**

Well, in this country we are adding more and more fertilizer and pesticide in order to increase the yield. That can't continue ad infinitum, can it?

## **HABIBA GITAY**

No, because ultimately we are getting the phosphorus from somewhere else. We can't continue with that. And that's what the problem with the earth is. When we say the planet is

fragile, that it is vulnerable, that it is changing, it's going to change and it's going to keep changing rapidly. And basically, it's not sustainable.

**BILL MOYERS**

What's not sustainable?

**HABIBA GITAY**

In terms of our use of the resources, in terms of our fertilizer input, in terms of our soil degradation, land degradation and so on, our lives are basically not sustainable.

**BILL MOYERS**

You mean earth could lose its ability to sustain human life?

**HABIBA GITAY**

That's basically what it'll come out to. Maybe other species will continue, but humans may, at the end of the day, have made themselves extinct through our pressures on the earth.

**BILL MOYERS**

How do we go about measuring our true impact on the planet?

**HABIBA GITAY**

That's what the Millennium Ecosystem Assessment is going to attempt to do. Right from the local level to the global level. At a local level, in many cases, it's relatively easy, like you talked about the footprint in terms of the light, or the footprint in terms of the water or food, or whatever we get. But when you try to scale it up, it's quite hard. So at the local level, we'd say, "Well, what is the impact of our deforestation?" and start measuring it consistently so we can build the whole of the regional picture, and then whole of the global picture together.

**BILL MOYERS**

How are you doing that?

**HABIBA GITAY**

Well, we haven't got the perfect tools but it would be to develop those tools — that is part of the Millennium Ecosystem Assessment. We can use satellite imagery or remote sense images just to see what the changes have occurred and how far the changes are going. So all those tools will have to be developed as we go along. We've got some of them being used in different parts of the world but we'll help each other to make sure most of the world is covered in that way.

**BILL MOYERS**

Is it too crude to call this a global report card?

## **HABIBA GITAY**

It's not too crude because I think the report card is a good concept for a lot of people. By developing that global report card, you're giving a picture not of just the U.S. or Australia or Europe or whatever, you're getting a picture of the whole world in terms of being able to support humanity and being able to support life. And then in five years time, if you do the same exercise again, you'd say, "Well, have we done better or have we done worse? Have we done better in some sections and worse in other sections? How can we make it better in all sections?"

## **BILL MOYERS**

Can you give a grade to the earth today?

## **HABIBA GITAY**

Most of the time, I'm afraid, it's D for a lot of systems. With agriculture, it tends to be a mixed C. Some areas, like Kansas, and so on, are losing a lot of their topsoil, and they're having salinity problems, but in other areas, they're doing quite well and agriculture yield is increasing.

## **BILL MOYERS**

But it seems to me that there's almost a new report on the environment every day. What's so new and different about what all of you are trying to do?

## **HABIBA GITAY**

We talked about the various pressures and the demands that humans are making, and the human activities that are affecting earth. In previous reports have tended to concentrate on one of those issues at a time, for example, biodiversity loss or climate change and so on. What [the Millennium Ecosystem Assessment] is doing is putting all of those things together and painting a holistic picture for decision-makers. So it is different in many ways. It's bringing in people from different disciplines together, and we'll also look from the local, regional, global scale at all of these pressures, all of these human activities, together.

## **BILL MOYERS**

The old cliché is that if present trends continue, X, Y or Z will happen, and then somebody says, "but present trends never continue." What do you say to that as a scientist?

## **HABIBA GITAY**

That's why the scenarios don't just work on the present trends. We'll actually take five or six different future plausible worlds into account. A lot of international companies work the same way. They know that the present trends don't work but they can paint a picture of what the plausible worlds would be in 25 years time or 100 years time. And this is what the scenarios are doing. They basically say, "Let's see if instead of the present trends going on, we change our consumption rate. Or we become a more civilized society and think of our neighbors and make sure that they have about the same income as we do." And so on. These are very dramatic changes I'm talking about, but you can also have very extreme outcomes.

**BILL MOYERS**

You seem to have such a passion for it. Did you bring that passion to science or is the work responsible for that passion?

**HABIBA GITAY**

(Laughs) I think you develop it as you go along. I teach graduate students who come from different backgrounds, and one of the things I really admired the most were the people who were passionate about things. They knew what they were talking about and they could convince you that, yes, this is an interesting topic. And I think you have to be passionate. You have to be convincing. And you have to love what you do, and try to get other people interested in thinking along the same way.

**BILL MOYERS**

How do you get passionate about global climate change?

**HABIBA GITAY**

Because it's going to affect us. It's going to affect our children. It's going to affect our neighbors in many ways. We have to learn to change. We have to learn to live with a different world. You just can't say, "Oh, well, we just live in a different world." You have to say, "Well, okay, we're going to have a different world to live in. What can I do to either prepare myself, or minimize that dramatic change in the world?"

**BILL MOYERS**

Do you have children?

**HABIBA GITAY**

Yes, I have one daughter.

**BILL MOYERS**

How old?

**HABIBA GITAY**

She's three.

**BILL MOYERS**

Well, that's a reason to be passionate. Last Thanksgiving, my oldest grandson said to me, "How old are you?" And I told him "66" and he said, "Well, what will the world look like when I'm as old as you?" And that was the first time I actually thought concretely about the future. I think of the future as an abstraction, but suddenly, I could see this eight-year-old being 66, 58 years from now, and wondering, what will New York, Dallas, Phoenix, Melbourne, or Canberra look like 58 years from now?

## **HABIBA GITAY**

And also, what are you doing to the world that's going to leave your children a legacy that they might have to live with? Do you want to leave the world a worse place for your children and grandchildren, or do you want to leave it a better place for them?

## **BILL MOYERS**

You and your other colleagues, have done a sort of test run on the millennial assessment — a pilot project on five major ecosystems. What's the bottom line for those five ecosystems?

## **HABIBA GITAY**

Most of them, as I said before, basically come out with the condition that the future's not too good. But I think a positive aspect of that report is what human communities are doing to improve their own ecosystems. So you might have degraded forested area, but the people recognize it's degraded. They're getting together, acting as a community, participating in improving the condition of the forest so the children, the grandchildren will have a forest there to get their honey, get their wood, get their water from. And that is a very positive aspect of those case studies.

## **BILL MOYERS**

Well, when you look at grasslands in Mongolia, the rain forests in British Columbia, the topsoil in the American Midwest, coastal areas—coral reefs in Brazil, and water in South Africa, would you say that those ecosystems are broken?

## **HABIBA GITAY**

Some of them are not healthy. In British Columbia, they're trying to use and harvest the trees as sustainably as possible so human needs are met. But at the same time, that the ecosystem, as a whole, is continuing in a very healthy manner. So they're not broken but they are...

## **BILL MOYERS**

Deteriorating, aren't they?

## **HABIBA GITAY**

In some of them they are. The Mongolian case is deteriorating because of the property rights and the nomadic life has been changed. So there, again, they're breaking. But the South African case is a positive story saying human action is getting rid of one of the human activities, which is destruction of species that are not local to the area and cause havoc to the systems.

## **BILL MOYERS**

I never thought I'd live to see the day that an environmentalist would be carrying a chain saw.  
(LAUGHTER)

## **HABIBA GITAY**

They are. You have to because of those invasive species are destroying the system. They're in the wrong place, unfortunately. Some of them are Australian and in Australia we don't have problems with them. But in South Africa, they are very problematic. You have to take the chain saw and do it. In this case, it's the local people — they're getting food for themselves because they're actually getting a salary for the clearance work that they're doing, and the community's becoming more cohesive. So it's a very, very positive way of getting rid of an environmental problem but enhancing the social values of the area as well.

## **BILL MOYERS**

What do we have to lose in these ecosystems? What's at stake?

## **HABIBA GITAY**

Ultimately the goods that we get from the ecosystems are getting fewer and fewer, and the capability of giving us those goods and services is actually getting less and less, because we are taking away one part at a time. Going back to the analogy of an engine, we're taking away a small part of the lead, or something on one of the wires. And that might not seem so bad, but ultimately it'll go all the way, and you lose that connection for the engine to work properly as well. And that's what we're doing. We're slowly deteriorating it.

## **BILL MOYERS**

I guess we've just come to take them so much for granted that it seems novel to think of the Earth as providing goods and services — gifts — if you will.

## **HABIBA GITAY**

In a way, yes, and the more people live in a city, the more we become removed from the natural environment, which is where all this is going on. We put in a lot of energy to do what a natural ecosystem does without all that effort. It's just part of that system to do that. So we're losing that connection between our environment and our society. But ultimately we depend on it.

## **BILL MOYERS**

Aren't ecosystems resilient? Doesn't nature heal itself?

## **HABIBA GITAY**

Not with the amount of pressure that we are putting on to it. In the past, the human population and the demands from the human population have tended to be low enough for the system to just absorb us. Now with our fertilizer input, our climate change, the loss of forested areas and so on, the pressures are just too much for a lot systems to carry on being resilient, and being able to just absorb that activity — those pressures — and carry on functioning as healthy ecosystems.

## **BILL MOYERS**

How do we know where the breaking point is?

**HABIBA GITAY**

Unfortunately, that's one of the scientific dilemmas. Until we go past the break point, we don't know that it's there, and if we could, as scientists, as ecologists, say, hey, you know, we're heading towards a break point, it would be wonderful, because we'd just tell the decision makers. But we don't have the capacity to be able to actually predict those break points. If you can master those, it would be fantastic.

**BILL MOYERS**

So if we can't, what do we do?

**HABIBA GITAY**

Well, I mean, we get collapse in economic systems, like the stock market collapses. Not many people predict that. But we recover, and we go on. But with the ecosystems what you want to do is say, okay, we may not have the same forest cover as we had before, but can we still get some of the food, some of the wood, some of the timber, that we rely on, some of the water that we rely on? It may not have been as much as it was before, but at least can we get some of it.

**BILL MOYERS**

Is there anything in your experience that suggests we human beings do change our behavior, and take the long term into consideration, and delay our gratification in order to accomplish a return we'll never get. I mean, do people still plant trees they'll never sit under?

**HABIBA GITAY**

I think so. There are lots of societies which still work on a longer-term view. We do think of our children and grandchildren, and therefore our decisions and our demands, change. I think the beauty of human beings is we can be very greedy and very demanding, but also once people start thinking that this is an important issue, we do need to change things, we can turn it around very rapidly. I'll give you an example that happened in United States, for example. Several years ago, the media ran stories about CFCs basically destroying the ozone layer.

**BILL MOYERS**

CFC's are?

**HABIBA GITAY**

Chlorofluorocarbons — chemicals that are produced as part of our air conditioning system, refrigeration system, and so on. So in early 1980s this was publicized as something that's directly human-related, and we can do something about it. The people were so concerned about it that they pushed the industry, and the politicians, to actually enact some legislation that banned the production of these very destructive chemicals.

They had alternatives, so we didn't change our life style, but in a way the ozone, stratospheric

ozone, got saved by the human action. The changes that we are asking for don't necessarily mean we change our life style dramatically. We may say, "okay, I won't use the car to go down to the local shops to get that milk I've forgotten, I'll walk instead."

**BILL MOYERS**

But every indication that I see is that we are increasing our reliance on the automobile, not diminishing it.

**HABIBA GITAY**

That's true, but you just wonder how long you can carry on. And also those automobiles don't have to have fossil fuels being used. Sooner or later, the pressure is going to come so much so that alternative fuels are going to be used for having our automobiles. So we might still have the car to get to the shop, but we might not be having such an impact in terms of our greenhouse gas emissions.

**BILL MOYERS**

So is your science going to help encourage and nurture a religious conviction about saving the Earth?

**HABIBA GITAY**

(Laughs) It's not a religion. I don't see myself as a preacher coming out and saying, you need to convert. But what we have to do is say, this is our knowledge base, this is what we are putting forward to you. Argue with us, discuss it with us, but at least try to move forward in making sure that the Earth doesn't collapse as a system that can support human life and human beings.

**BILL MOYERS**

Because if it does, you don't think it can be put back together again?

**HABIBA GITAY**

No, it'll be impossible, we'll just be wiped out as a species.

**BILL MOYERS**

And we can't find these goods and services anywhere else?

**HABIBA GITAY**

Do you know of any other planets that might have these goods and services for us? I don't at the moment.

**BILL MOYERS**

What about the human imagination, the human creative capacity to do what it's never thought of doing before?

## **HABIBA GITAY**

That tends to be our long-term optimistic view, that we can leave a very bad legacy for our children or grandchildren and they'll find a solution. But I think we're running out of those solutions. We've tended to rely on natural resources to give us those solutions, and if the natural resources are being depleted or degraded, where are we going to get those solutions from? We still have to be on planet Earth.

## **BILL MOYERS**

Well, the history of the twentieth century alone would suggest that human beings are capable not only of indifference, but of great cruelty and barbarity to each other.

## **HABIBA GITAY**

Surely as we become more civilized, more educated and more globally thinking in our view...

## **BILL MOYERS**

More civilized than the German society in the 1920s and 1930s? At some point, like ecosystems, optimism breaks down on the realities of human nature.

## **HABIBA GITAY**

Ultimately what we are facing are conflicts over natural resources. And we've already seen in certain parts of the world, that you've got conflicts occurring over water rights. In parts of Middle East, for instance, some of the conflicts revolve around enough water coming through certain countries to support their lifestyle, and they're willing to kill each other over that. And maybe that's what we're going to end up facing: conflict and human death, fighting for natural resources.

## **BILL MOYERS**

See, I think you come much closer to it there than, the understandable but often misplaced hope in an idealistic realization that all things are connected. I mean, that's one of the most commonplace clichés of our era, that all things are connected, and one most flagrantly violated, by our activity.

## **HABIBA GITAY**

In many ways. But I think what we're doing with this Millennium Ecosystem Assessment is showing that connectivity, showing the positive aspects, that you can actually change to make sure that that connectivity is maintained. But ultimately, as a human being, I'm fairly optimistic, and I really don't like to think about major conflicts, major wars, over natural resources. I know people have done barbaric things to each other. But do we really want to continue like that?

## **BILL MOYERS**

When you talk about our daily living, I have to confess that we Americans have one of the highest standards of living in the world. When you come to this country, aren't you appalled by the standard of living?

**HABIBA GITAY**

I'm appalled by the waste, unfortunately. In terms of the mineral resources, for example, we use ten percent of what we extract from Earth, so we waste 90 percent. And so if you can actually improve our efficiency of use, rather than wasting all that — all that food, having triple packaging and so on. It doesn't change our life style, but it does affect the Earth dramatically in terms of reducing the impact on it.

**BILL MOYERS**

And you think we can change?

**HABIBA GITAY**

I don't think we have any choice. We have to change.

**BILL MOYERS**

Last question. You were one of the leading authors of a recent worldwide study of global climate change?

**HABIBA GITAY**

Yes, I did.

**BILL MOYERS**

And as a result, do you feel like it's really happening?

**HABIBA GITAY**

Global warming is definitely occurring.

**BILL MOYERS**

Stake your reputation on it?

**HABIBA GITAY**

I'm not the only person. We have hundreds of scientists who have staked their reputation on it, that it is occurring. We've changed our temperature, surface temperature of the Earth, at a rate that has not exceeded in the last 420,000 years, and that's using ice core data availability. But also those changes are having an impact on our natural systems. Some of the population ranges are changing — animals are migrating further north, further south. Some of the populations are decreasing in their size.

**BILL MOYERS**

So I'm not sure that I'm as optimistic as you that what you scientists find actually find its way into human behavior and political policy.

## **HABIBA GITAY**

I think in certain countries, for example if you look at some of the European countries, the decision makers are convinced that basically this is something that we need to take action on. And they are changing their use of energy, fossil fuel energy and so on. I think it's up to the media, and to a large extent also the scientists, to communicate to the broader audience, and to get the decision makers, or put enough pressures on the decision makers to say, yes, it's happening. We don't want you to stay away from signing or ratifying the Kyoto Protocol. We do want you to take action, because we believe it's happening, and it is affecting our life style, our life, and our ecosystems. So in a way, it is up to the scientists, and the media people, to work together — to say, how do we get that message and scientific knowledge, not just to the decision makers, but to the public, widely enough for them to convince decision makers that they need to take action.