

VIDEO | SEPTEMBER 12, 2023

Droughts and Deficits: Unlocking the Potential of Green Water | World Bank Expert Answers



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What is the impact of droughts on economic growth? Across much of the world,

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diminishing watersheds, rivers, and lakes. A resulting water deficit will have its own global ramifications for development.

What will this mean and why will improving how policymakers manage droughts be critical in preventing further losses? What will be the **economic impact of worsening drought** for low-and-middle income countries? And how can “green water”, moisture in the root zone of soil, help shield economic growth?

In this episode of [Expert Answers](#), we answer these questions and look at what the World Bank is doing to **make drought resilience a priority**. Joining us are [Esha Zaveri](#), the World Bank’s Senior Economist for the Water Global Practice, and [Richard Damania](#), the World Bank’s Chief Economist for the Sustainable Development Practice Group, whose report [Droughts and Deficits: The Global Impacts of Droughts on Economic Growth](#), unpacks these issues further.

Timestamps

[00:00](#) Welcome! Introducing the topic and the experts

[01:10](#) Water deficits are becoming the new normal

[04:00](#) Consequences of a severe drought for a country's economic development

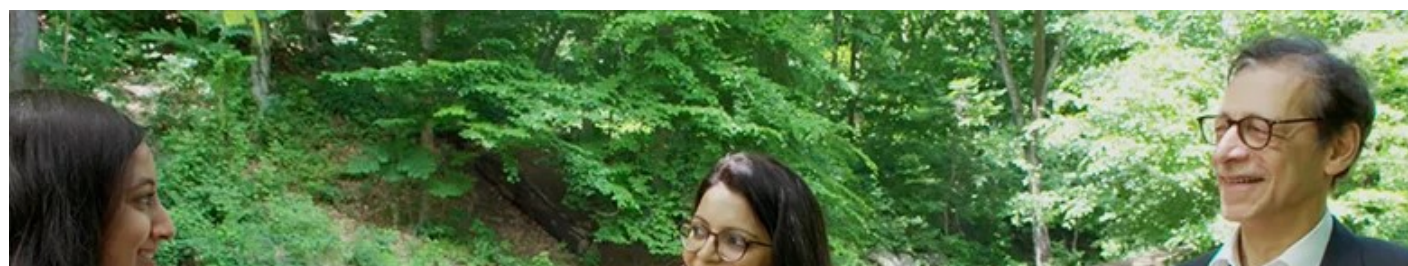
[06:33](#) What is green water?

[10:49](#) What policymakers can do to better manage drought events

[13:17](#) Helping countries prioritize drought resilience

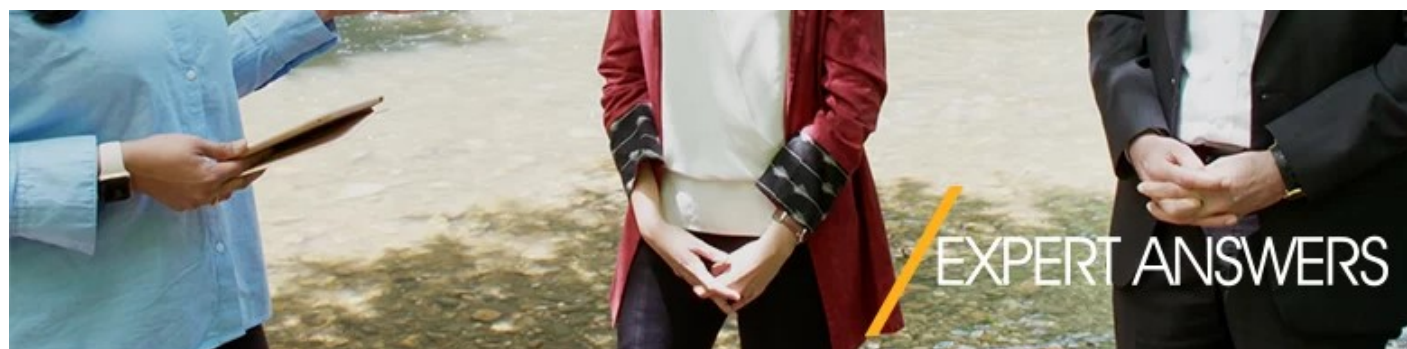
[15:50](#) Hope on the horizon

[16:59](#) Thanks Esha Zaveri and Richard Damania for sharing your expertise!



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Transcript

[00:00] Esha Zaveri: - Climate change is the shark, water is its teeth, and this is because the impacts of climate change are deeply felt mostly through water.

Richard Damania: - When the drought comes, and the drought will always come, you're going to be hit a lot harder if you've destroyed your forest rather than if you actually had your forest over there as a buffer.

Srimathi Sridhar: - **Hello, everyone**, I'm Srimathi Sridhar from the World Bank, and this is [Expert Answers](#). On today's episode, we're looking at a [new report from the World Bank titled "Droughts and Deficits,"](#) and it is in fact the reason I'm outdoors today. Key messages from this report look at the hidden potential of green water for growth impact, the dangers of water deficits for global growth, and the critical need to make drought resilience a priority for low- and middle-income countries. So how do we do this and why is it so important? [Richard Damania](#), Chief Economist in the Sustainable Development Practice Group of the World Bank, and [Esha Zaveri](#) is a Senior Economist in the Water Global Practice, join me on Expert Answers to discuss.

[01:10] Srimathi Sridhar: - So Esha, let's take a few steps backward and perhaps you can paint a picture for us as to what's really at stake here.

Esha Zaveri: - So thank you so much, Sri, for having us. Really excited to talk about our new report. So as you said, indeed, **water deficits are becoming the new**

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is because rising populations and growing prosperity is increasing water demand. At the same time, human activities are degrading vital water supplies, and so this is creating a global water deficit, which is expanding to new areas around the world, and it's also worsening in places that are already water scarce. Climate change is only compounding these challenges. It's often said in the water sector that if climate change is the shark, water is its teeth, and this is because the impacts of climate change are deeply felt mostly through water. And so we're gonna be facing a world that is gonna experience more severe water deficits punctuated by extreme wet conditions. And so think of a picture where you have these collision of two forces of the 21st century. You have population growth on one hand, climate change on the other. And so if you project future population growth and the availability of water up to 2050, what you will find is that there are areas where water stress and water scarcity is expanding and intensifying. And most of these places happen in areas that are often poor, that are sometimes fragile, and that are sometimes in conflict. But despite this growing concern for water scarcity, it is floods and deluges that have really captured the attention of policymakers, and for good reason. These are high-impact events, highly visible, that destroy critical infrastructure. They can damage homes and really disrupt the livelihoods of millions. But droughts, on the other hand, they're really difficult to understand. Their impacts often emerge gradually, less visibly, and so they're often called misery in slow motion. They have impacts across different sectors. They can impact agricultural systems. They can disrupt farm productivity. And so what we do in this report is really look back into the recent past, and we take this growing, intensifying water scarcity along with rainfall variability to really understand the overall impacts on economic growth at a really granular scale.

[04:00] Srimathi Sridhar: - Hmm, I mean this certainly is a serious issue, right, Esha, especially thinking about it as a misery and slow motion. That does not sound good. And you talk about how it disrupts livelihood. So I wanna get to people, and, Richard, I wanna bring you in here because in a lot of low- and middle-income

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Richard Damania: - Let's start by talking about the geography of change that we are actually seeing. So what we are seeing across the world now is the areas that are covered in dry episodes are actually increasing. More and more of the globe is encountering drought. That's the first problem that we have. The second problem that we have is that the frequency of drought is actually increasing, and it's increasing in hotter parts of the world. The hotter parts of the world also happen to be the poorer parts of the world, the developing countries. We see no such trend in the cooler parts of the world, which is, of course, where the richer countries actually are. And what happens when you actually encounter these droughts? Well, you tend to find that GDP, that is economic growth, tends to slow down. Why does GDP growth tend to slow down? One reason is very obvious. You get a drought, there's less rainfall, crops may fail. Not only crops failing, but yields may actually fall even if you don't get a complete failure of crops, so that, of course, affects the rural economy. But you have these hidden insidious effects also occurring in the cities. What you find in many cities, for example, especially in Latin America that relies on hydropower, you get a drought, there's less water. Therefore there's less hydropower. There's less electricity. That disrupts economic activity in the city. Then it gets a little bit worse. When you have droughts, water quality tends to decline. So you see spikes in waterborne diseases, things like cholera occurring where you have droughts. And, of course, you always get the poorest people that are most affected. So it's the informal businesses that are most affected. Most often when we think of cities and droughts, people think of things like Day Zero events that happened in Cape Town, where water supplies fell to such a drastic level that people said, "It's Day Zero." But long before you hit Day Zero, you begin to see the impacts. It's the most vulnerable people in the cities that are most affected by droughts.

[06:33] Srimathi Sridhar: - And I think another nod to how this affects so many different areas, right? This affects health, jobs, wellbeing, et cetera. So I think thinking about it that way really helps one understand the scale of the issue here. I do wanna talk about one concept that's mentioned in the report, and that is

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something pretty important to unlock with that.

Esha Zaveri: - Yeah, so green water is often hidden from sight, partially hidden from sight, I guess, but it is completely intertwined with different processes of the Earth's system. So green water is basically moisture that is stored in the root zone of the soil. And these soil moisture levels, one of the key factors that impacts them is the amount of rainfall that occurs over a period of time. And so what our report shows is that if there have been wet episodes in the recent past, if it has been wetter, adequate soil moisture can basically neutralize the harmful impacts of drought in some places. Conversely, if the recent years have been drier than normal, then the impact of a dry shock on economic growth can be considerably larger and stronger. And we also find suggestive evidence that it's really the local and upstream forest cover through which some of these impacts manifest. So what do I mean by that? So forests can really help to preserve green water and maintain soil moisture levels in watersheds, and this is because these roots, they act like natural sponges, and so they can absorb water, it increases the amount of water that can enter the earth, adding to the soil moisture, in turn recharging groundwater. But the unfortunate part is that new scientific evidence shows that we have surpassed the planetary boundary for green water. What our results show is that the consequences of breaching the safe planetary boundary can also have significant economic consequences. So to give you a context into why green water is making news in recent times is because previously researchers had only accounted for water in rivers, in lakes, in groundwater, so-called blue water, in their planetary boundary evaluations, but this missed the important crucial role of green water and particularly soil moisture, which is especially important for the resilience of the biosphere. So scientists tell us that green water is very critical for the functioning of the water cycle. It's very important for regulating the Earth's climate, so it's also critical for climate resilience and for maintaining the health of terrestrial ecosystems. It also has a lot of strong interactions and feedbacks with other processes. So what do I mean by that? For example, soil moisture, it can decrease if

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the stores of water in our soils, green water, in mitigating drought impacts that have so far not been appreciated when you think of the economic consequences. And the results also really highlight the need for stewardship of our landscapes, of our forests, and our natural capital because they can help improve soil health and retain water, which are also seldom associated with the growth impacts of droughts, but they can be a cost-effective way to really strengthen climate resilience.

[10:49] Srimathi Sridhar: - I feel like I'm learning so much about Mother Nature here today just speaking with you both. I had no idea about this difference between green water and blue water, so thank you for explaining that, Esha. We've talked a lot about kind of the issues and what is at stake, but how does this impact people, and why do we need to sort of step in to address it. And, Richard, I wanna talk about policymakers for a minute here because what is it that they can do to **better manage drought events and prevent further losses in economic growths?**

Richard Damania: - The first most important thing is to understand the impact of drought. It's not just a matter of a river drying, and it's not just a matter, very often, of not having enough yields or your crops actually declining for whatever reason, the lack of water. What tends to happen in some of the poorer parts of the world is when you get a drought, there's a lack of food. Children that are born during drought years don't get enough nutrition, so they don't reach their full development potential. They may end up stunted, so they don't grow to the full height potential that they have either mentally or physically, and, therefore, they tend to be actually poorer. So what you tend to find is that droughts cast a very long shadow across an entire generation. It is not just a fleeting episode. So understanding that tells us that managing drought, we don't just manage what's happening to water. We also have to be very mindful of what's happening to the incomes, especially of poor people. That is something which has often been missed because when we think of droughts, we think of what's happening to food security or not happening to food security, and we miss the fact that you get less food, and you get all of these hidden

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want would be some rural safety nets to ensure that children get enough food. They don't have to endure the consequences that arise when it comes to famine. The second big policy question, which is often ignored, is really what Esha was talking about, the importance of green water. And one of the key things about green water is the amount of forest cover that you have. You destroy your forest. It's not just a matter of biodiversity, it's not just a matter of carbon sequestration, but now you're actually learning that when the drought comes, and the drought will always come, you're going to be hit a lot harder if you've destroyed your forest rather than if you actually had your forest over there as a buffer.

[13:17] Srimathi Sridhar: - A great way to put it. And Esha, bringing this a little bit closer to home in terms of the World Bank and what our institution is doing, **what is the Bank doing to help countries prioritize drought resilience?**

Esha Zaveri: - So the World Bank has many mechanisms available to help countries build drought resistance, drought resilience or resistance, and these include supporting countries to develop early monitoring systems. Drought monitoring is really critical, to anticipate droughts, and also help prepare countries to formulate drought preparedness plans. The World Bank also helps countries to identify and also finance, build water storage solutions, as well as natural storage solutions that we spoke of, and also help to manage them as a system in an integrated manner. Finally, the bank helps support countries across sectors, so this means supporting irrigators or water utilities or other water service providers. And I should note that because there is this growing need for drought preparedness, the [Water Global Practice at the World Bank](#) is currently putting into place and developing a cogent and a very focused drought program for countries. This is going to include diagnostics and analytics but also regional drought bulletins and also new assessments so that we can identify really the priority activities that we need to focus on across a menu of investments. And so there's a lot that the World Bank can do to really help countries be more proactive and more deliberate and to do this in a very integrated manner so that they can better prepare as well as respond

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when it comes to water.

[15:50] Srimathi Sridhar: - Well, this is wonderful to hear, Esha. I know we've talk about something that's very serious, and we've really unpacked a lot, but I think we've also talked about ways we're addressing this so that countries can mitigate some of the more drastic effects. So before I let you both go, I'm curious to hear hear, **what makes you both hopeful when you think about the future that lies ahead**, given everything we've spoken about here today?

Esha Zaveri: - This new finding in our report about the stored water in our soils. And so as the climate is heating up, and it is already heating up, as we know, it's these water in our soils, the water in our groundwaters and rivers, and if we have these well-managed landscapes, and forests that nurture them we really have our frontline climate warriors in place as long as we know how to harness them well.

Srimathi Sridhar: - And Richard, what are your thoughts?

Richard Damania: - I fully agree with that, but we would never have got to that result if we didn't have the data and the information. And this new world that we live in with so much more information and data allows us to discover these things. That makes me optimistic because hopefully if you understand what's happening with the causes, you can begin to tackle the right solution. Prior to that, very often we might have been doing the wrong things, but now we actually understand that if you destroy a forest to build something, you're probably ending up worsening the problem rather than naturally improving it.

[16:59] Srimathi Sridhar: - And I think, for me, the one thing I'm really gonna remember from this conversation is the picture you painted earlier, Esha, which is that if climate change is a shark, water is its teeth. I think pretty powerful and a good way to kind of think about those two and the compliment to each other. A huge **thanks** to Esha and Richard for joining me on [Expert Answers](#) to talk more about the [report "Droughts and Deficits."](#) Now if you wanna learn more about what

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