WORKSHOP A
THE GLOBAL FOOD SECURITY INDEX:
EXPLORING CHALLENGES AND DEVELOPING SOLUTIONS

Tim Glenn and Pratima Singh
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Introduction

Barbara Stinson
President - World Food Prize Foundation

Welcome to a new component of the International Borlaug Dialogue, one of four selected interactive partner workshops. These workshops showcase amazing work going on by partners of all types, working on big challenges to provide data, technology, and the resources to reduce food insecurity in different parts of the world. All of these featured workshops offer greater interaction between our virtual participants and the various organizations that are presented. Importantly, all the work offered today would not be possible without the diverse, strong partnerships you will see that are executing these tools and programs, focused on transforming aspects of our food systems.

The first workshop today is titled, "The Global Food Security Index: Exploring Challenges and Developing Solutions." It's hosted jointly by Corteva Agriscience and the Economist Intelligence Unit. It explores the latest findings of the 2021 Index, or GFSI, launched October 12th. This year's index allows us to look at the underlying factors affecting food insecurity at the country level. You will take a quick tour through this tool and learn to navigate the masses of data of the GFSI to understand macro-level problems, draw conclusions for policy and business operations, and identify research priorities to tackle food insecurity. Science, research and innovation are vital to solving food insecurity. We hope you'll find this tool fascinating and innovative. Thank you, Corteva, and the Economist for showcasing this important work for everyone gathered today at the International Borlaug Dialogue.

Workshop Leaders

Tim Glenn Executive Vice President, Chief Commercial Officer, Corteva Agriscience
Pratima Singh Senior Manager, Policy & Insights, Economist Impact

Tim Well, good morning, good afternoon and good evening, and thanks for joining us today. My name is Tim Glenn. I'm the Chief Commercial Officer for Corteva Agriscience. I lead the global team at Corteva responsible for serving millions of farmers all over the world. I am joined by Pratima Singh, Senior Manager, Policy and

Insights, at Economist Impact. She's joining us from Singapore. Good afternoon, Pratima.

Pratima Hi, Tim. Thanks very much for having me. Good afternoon to you.

Tim And it's our pleasure to be here and welcome all of you to this special interactive workshop during the 2021 Borlaug Dialogue about the Global Food Security Index: Exploring Challenges and Developing Solutions. Corteva Agriscience is proud to be the exclusive sponsor of the Index for the tenth year in a row, making it available at no cost to everyone from the Economist Impact website.

The Index provides a comprehensive look at year-over-year changes of the factors impacting food security. It considers the issues of affordability, availability, quality, safety, natural resources and resilience in 113 countries, providing reliable data for the decision-making by governments, industry, NGOs, academics and others to ensure food security in the future.

The 2021 Index was launched on October 12, and I hope you've already downloaded the report and new Index. If you haven't, please check out the link in the chat so you can follow along with us today. If you've already read the report, know that the Index shows that food security has been on the decline for the past two years. This comes after eight years of consistent improvement and despite significant advancements in technology across the food chain. Factors like extreme weather putting pressures on farmers and natural resource depletion are impacting sustainable production and food security worldwide. This is a borderless problem that needs our attention.

And while all of us have a role to play in addressing food security, solutions begin with farmers who help feed all of us, farmers who are continually being asked to grow significantly more food with fewer resources and increasing scrutiny from society. And the global COVID-19 pandemic has put pressure not only on farmers but on the entire food system. Today we're going to explore the latest report, which focuses on taking action. At Corteva we're focused on doing just that, through our actions and commitments that align with our purpose to enrich the lives of those who produce and those who consume. I'm going to share three examples of how we're doing that.

First we're focused on providing innovative products and solutions to farmers that help them produce quality products while meeting personal goals for their operations. Second, we have set a 2030 Sustainability Goal to protect and preserve the source of our food and help communities thrive. This includes training millions of farmers on soil health and nutrient and water management stewardship and best management practices. And third, we're collaborating with farmer groups, NGOs and policymakers to advocate for enabling environments such as practical, science-based policies and regulatory systems to ensure that farmers can have certainty and understanding of market and trade opportunities.

But as you'll see today, the GFSI shows we have more to do, because hunger is still prevalent across the world. To that point, let's start with the first audience poll question. I'm going to show the question and ask that you type your response in the chat.

So the question is: In 2020 what percentage of the global population was estimated to be moderately to severely food insecure? You've got three options to choose from: 15%, 30% and 40%. So please take a second and type your response in the chat. So as the answers come in, the answer is actually 30%. So, Pratima, with that number in mind, I'm going to hand it over to you to take us through ___ the Index what it is and how it can help raise awareness and we can take action to improve food security.

Pratima Thanks very much, Tim. You're absolutely right. The number, the percentage of the global population that was moderate to severely food insecure in 2020 is 30%, which is a large number, a very striking number to start off with. And so really talking back to the point of how this needs to be a concern for policymakers, private sector, and for the society going forward. And with that in mind I want to take you through the Global Food Security Index, the 10th edition of the Food Security Index that allows us to see some key findings, year-on-year trend as well as ten-year trends, really allowing us to give more understanding of the drivers of food insecurity.

So let's talk about what is the GFSI and what we're really trying to measure through this Index. So to start with, as I mentioned, we launched this Index; the first edition was launched in 2012. So this year the GFSI 2021 is in fact it's tenth year. And we started off a little bit more simply, of course, supported by Corteva Agriscience from the beginning. The GFSI started with about 105 countries back in 2012, and we've expanded the Index to include more and more countries; because what the GFSI allows us to do is really examine the enabling environment for food security from a global perspective across these 113 countries and provides best practices, tools, benchmarks for countries to measure progress, and really an actionable roadmap for policymakers as they look to achieve the SDG Goal to zero hunger. All of this information, I'm sure you've seen, is available on the Economist Impact website, so you can download all the resources and follow us today as we take through the insights.

As mentioned, the Food Security Index, Global Food Security Index is a quantitative and qualitative benchmarking tool, and it's constructed using a framework that includes 58 indicators and categorized by four pillars. These four pillars allow us to examine and explore the enabling environment for different countries to achieve food security. And this is of course applicable to both developing and developed countries. These four pillars are: affordability, availability, quality and safety, and natural resources and resilience. And it's really important to look at all four together in a holistic way to examine those drivers of hunger and underlying causes and underlying factors that are determining food insecurity.

Last year in 2020 we added this fourth pillar of natural resources and resilience into the core Index. So we added it as a fourth pillar, because we find that it is no longer possible to have a conversation on food security without talking about sustainability and risks to the natural environment. And so by including this as part of that whole Index, we're hoping to inextricably link the conversation on food security with that of sustainable food systems.

All right, let's dive into what are some of those key findings from the 2021 Index. At a very high level, the overall picture shows that global food security and the environment for global food security has degenerated marginally for the second year

in a row. We saw a slight dip, even last year in 2020, and we've seen further deterioration in 2021. This is after years of improvement from 2012 all the way through to 2019.

In terms of leaders and laggards we see that it's unsurprising, but high-income countries in Europe continue to lead the Index. They take up about 7 of the 10 spots in the top 10, while the other side and in contrast, sub-Saharan Africa nations continue to dominate the bottom ranks of the Index and take up 7 of those bottom 10 spaces. So essentially we've seen a little bit of that regional shift or regional aspect play out as well.

But rather than just talking about what we are seeing, we want to dive in a little deeper and see why we're seeing this decline, why some of these dips are in fact taking place, especially in the past two years.

Well, let's break this down by category and look at what's happening in the four pillars. So on average you'll see that the global food security environments for 113 countries is about 60.9, but you'll see how the different pillars are actually scoring differently. So to start with, of course we see quality and safety is the highest scoring pillar. But what really was the driver of that decline in 2020 and 2021 was the deterioration in affordability that improved from 2012 through to '16, but in the last years have seen a deterioration. And this is really important to note specific point we want to look at, because affordability of food is very closely correlated and linked to prevalence of hunger and other metrics around undernourishment, like stunting in children under five. It's important that this is a metric we continue to improve on.

The second pillar that I want to flag that I want to flag is in fact natural resources and resilience. Again, here you will see that this is the pillar that is on the other end of the spectrum from quality and safety, because it is the lowest-scoring pillar almost across all countries. And it's important to note that the average overall score is 60, but that the average overall score in this pillar is 50 points, which is whole 10 points lower than what we see on average. And this is really important to understand, because we can see that this is an area that all countries have to focus on.

Other factors like availability continue to also be… Availability is the 3rd scoring pillar here, and there are specific aspects of availability that we need to continue to focus on in order to really move the needle in ensuring that all of these other aspects of food security, including natural resources, quality and safety, as well as affordability continue to improve.

In terms of what's going on actually like in a group, by breaking it down by income groups, what we see over the ten years is that there is a very strong correlation between income levels and of course food security. We do see, though, that there is still progress to be made across four income groups in the Food Security Index. We see that overall low-income countries have improved and that progress is also moderating a little bit. However, high-income countries that had previously made substantial gains in the Index have started almost plateauing, if not declining, in the overall food security environment. And really so the message here is that it's important to look at, even in high-income countries, to look at food security. Because what we can see is that over 80% of the countries in the high-income group improved

their score from 2012 to '16, and then since then we've seen a plateau or decline. And the reason for this is that there has been a dramatic or substantial drop of decline in focus on agriculture [inaudible] across the board but in particular in high-income countries. And so as we face challenges with climate volatility, this continues to be an area that needs to be prioritized going forward.

Looking at it from a regional lens, we see that North America and Europe continue to meet the Index in terms of their overall scores. I mentioned that Europe had 7 out of the 10 top spots. North America, which comprises the U.S. and Canada in our Index, continues to be the top-ranking region and followed very closely by Europe. On the other end of the spectrum is the sub-Saharan Africa at the bottom with a lot of room for improvement. In the middle there, along the average of our overall Global Food Security Index scores as well, we see the regions of the Middle East and North Africa, Asia, Pacific and Latin America. And so what we find is there's still a lot of space between the regions. We are seeing some clustering. And in an effort to improve food security, all regions need to prioritize figuring out and managing the drivers such as affordability, availability, quality and natural resources.

So just before I show you the model, quickly I want to highlight a few learnings that we have seen in the past ten years of doing this data collection, measurement and analysis. What we see is there are some big shifts in changes in certain countries' environments for improving food security. On the left side you see countries that have significantly improved their food security environment, and on the right side you see countries where this has declined quite dramatically. Tanzania, China, Cambodia, Kenya, some of these countries really improved affordability by boosting market access, improving food safety nets, and driving food costs down. And on the other side, you see Venezuela, Colombia and Brazil. These countries actually had experienced higher food costs as a result of which the performance in the Food Security Index deteriorated. And in particular we see even for Brazil and Venezuela, Venezuela was obviously impacted by tremendous conflict while Brazil also faced issues around sufficiency of supply and volatility of agricultural production.

Finally, we see some improvements in the Middle East as well with with Algeria, UAE, and Pakistan some metrics on the availability side of things, by insufficiency of supply and by prioritizing their commitments to food security.

I want to take this opportunity to show you the model at a very high level before we dive deeper and answer some questions on this. All of this information that I've just highlighted is available through our GFSI model, so you will be able to see countries that are in the top, so I did mention 7 out of the 10 we see. You can play around with us to see which countries are at the top, you see which countries are at the bottom end of the Index as well. And there is a big difference between the top score and countries at the bottom, like Burundi and Yemen that score one third of the points that we see for some of the top-scoring countries. We can also break down the Index and go deeper into each individual indicator, the 58 indicator, by playing around the themes Explorer tab, looking at specific countries, by clicking and choosing into the 13 metrics on where they probably performed under each individual category, comparing categories as well, countries as well and then your party, and then finally

also doing a little bit of analysis by looking at things like a scatterplot that allows us to look at the correlations of different indicators of the awards for the other metrics.

So, for instance, I will leave you with this before I hand back to Tim. We can look at things like the overall food security environment and hunger metrics. I mentioned stunting, so let's look at how that relates. You can see here a very strong negative correlation between the overall food security environment and the percentage of children that are stunted—it's a very strong negative ___. And so we know that by improving the overall food security environment, we can potentially bring down this number quite, quite significantly.

So I'll leave you with that for now and hand back to Tim to take us to some conversation and dialogue.

Tim All right, very good, and thanks for the overview, Pratima, and clearly a very powerful tool, deep-data resource and again available to everyone right now. So before you kind of guide us through how to do a deeper dive, maybe we can take some real-life examples on how the Index can be used by attendees in their own countries. So maybe start off here in honor of our 2021 World Food Prize Laureate, Dr. Thilsted, let's talk with Denmark. So as our attendees know, Dr. Thilsted is a native of Trinidad and Tobago and a citizen of Denmark, and she's being recognized for her groundbreaking research in aquaculture and food systems. So overall Denmark ranked 17th in the Index, and the country has a very high ranking on affordability and quality and safety but is #43 on availability, and that's a drop of 12 places since the last Index. Can you talk through where to find these statistics on the model and what it might mean for decision-makers in Denmark?

Pratima Absolutely, yeah, that's a really good question. It's obviously top of mind. We mentioned that Europe tends to well, but let's take a deeper dive into this country. We can go into the model and look at the one page. Once you download the model, this is the screen that pops up on your page. We click on Explore the Index, and this is where you are able to see all the different country rankings across the four pillars and on the overall environment.

So let's pick Denmark, as you mentioned and see where it lies on the Index. As we mentioned, 17th place in the overall food security environment. Excellent in terms of affordability, frankly #1 here. On the third pillar of quality and safety, we see it's #5, and on the natural resources it's #25 out of 113. All these are relatively good, and to your point, it does rank… We have to scroll down in the model, which means it ranks a little bit lower on the second pillar of availability, #43. In fact, between 2020 and 2021 it's dropped 12 places and decreased by 3.5 points. Let's play around with the Europe, the comparison here. So let's look at 2012 so over the 10-year period of the Index, what do we see for Denmark? We saw of course at 17 this year, but it still, it's dropped 25 places between 2012 and 2021, so it's seen a significant decline in this particular category. And so we want to examine really what's driving this. And the way that we can do that, using the Index, is really looking at Country Profiles. So we go into the select country tab on Country Profiles and then pick Denmark, and we've seen it loading on the screen in just a second. The comparison here as you see here is 2012, and we can see the overview. As you see here, it's improved in affordability and then too that it is doing rather well on that. It's done well in quality and safety; it

made small improvements, so they still need to grow and improve in the fourth category of natural resources. But it has declined by 6.9, almost 7 points in the availability category. And what's driving this—you'll see there are some red boxes there, which means that this is a very weak particular indicator here. For those improvements to prove…, the loss that can be improved, and in particular, volatility of agriculture production needs to be a big focus for policymakers going forward. It's dropped by 46.6 points. This is essentially looking at how much volatile and how unpredictable the agriculture production is [inaudible] for a particular country. So we know that this is an area of focus that needs to be prioritized.

We can even come under the Compare Countries page tab and check how Denmark is doing with another country. [inaudible] let's take the Netherlands, for instance, and see how it ranks or compares against a country like the Netherlands. And again you'll see here ___ ranks 17 versus the Netherlands __ 6. It does tremendously better than the Netherlands in affordability. Availability needs to be prioritized, and pretty close around quality and safety and some room to improve for natural resources and resilience.

And so I want to bring that natural resources and resilience up, because we can see that both Netherlands and Denmark have a lot of space to improve in this particular indicator. And it's not just these two countries. One of the things we see is that this is a space, an indicator of a particular fact that can be improved in a number of countries. So, for instance, let's look at this map that showcases volatility of agricultural production for the countries that we cover, the 113 countries that we see, and you'll see that there is some red here in Europe and Australia as well as parts of Africa. And so this is really a space and a particular metric that needs to be prioritized going forward. And we see that there are signs that this needs to be fixed, because they're seen as research and developments ending and investment declining, why we see risks to the climate and variability increasing. And so it's really critical that we are able to prioritize building resilience to some of these shocks in order to make sure that we are protected against some of these risks that are impending and that are very likely to come up in the short term rather than the long term anymore. This is the metric on natural resources and resilience, which is the fourth category. And you'll see very few spots here and a lot of room to improve.

I want to hand it back to you, Tim, but maybe I'll pose a question to you in return, if I may. I know you're speaking to farmers every day and you travel around the world. I'd like to maybe first ask you—how are you seeing this resilience play out on the ground and around the world in your conversations with farmers?

Tim Yeah, absolutely it's a great question. And farmers deal with a lot of incredible challenges and uncertainty every day, and throughout seasons, across years there's new and ever-changing environments that they're dealing with. And they can be things like weather, markets, whether it's price or access to markets. It could be pest pressure, things that they've dealt with in the past or new pressures, or maybe more structural issues around access to capital or infrastructure within their local market.

And so I think farmers are very special individuals, and as a group collectively, I think that they're not able to do what they do without having that by to overcome, ability to deal with that adversity. And when you consider layering on the challenge

we've had over the past two years with COVID-19, certainly everything I just mentioned before was magnified just because of some of the challenges that they were having, either from a personal standpoint or within their communities as well.

So it is something that's absolutely critical, and in terms of how farmers deal with things, how they overcome, it's a constant learning process, that pursuit of new technologies, new practices that will make them more economically sustainable, sustainable from an environmental standpoint and ensure that their operations are going to be successful not just this year, not just next year, but over the course of a generation. You know, farmers take that generational view, and as you think about resilience, they have to be able to deal with the short-term challenges like the weather and certainly be in a position where they can be effective in the long run.

And it's through that constant learning, constant improvement, and constant building of their operations that they do it. And I see that with smallholder farmers around the world, and I see it with some of the largest, most sophisticated operations. In my role I get to work with every range of farmers on every continent, and it's an incredible ability of farmers to have that resiliency to overcome and continue to move forward and help support the growth around the world.

Pratima That's really interesting. Thank you for sharing that.

Tim And I appreciate the question. So maybe I'll ask a question that came in from the audience here. And I mentioned technology is one of the factors that farmers are using, and when you think of the role of technology in terms of really impacting food security, how do you think things have played out over the last ten years? And maybe what do you see the role of technology in the coming ten years?

Pratima A really, really critical question and very much something that we're monitoring very closely, because we do know that innovation and technological developments are really the key to solving this crisis around producing more food in a sustainable way and nutritious food to be able to feed our populations. And so those are important metrics that we're looking at as well, to be able to see the whole thing.

And looking at that from a perspective of agriculture R&D, as I mentioned, this includes technology and access to agriculture technology, education and resources, lots of room to grow, here to be ranking stages so you can see how this is playing out. We've got some countries that have improved overall between 2012 and 2021, but there are still some red spots here, and so there is a lot of room for improvement in this particular individual and of course overall agriculture, research and development, technology, the big component in that. And so we see there's quite a bit of red, so several countries have in fact deteriorated more. More countries have deteriorated in this particular indicator than have improved over the past ten years. So we know that this is an important area that needs to be prioritized. And then of course we've also got other metrics that include such as access to mobile data and banking, where we see countries making significant efforts.

So I would say that overall we're seeing some improvements in particularly more simple tools that are provided. There still needs to be a lot more work on more innovative and sustainable linked, I guess tools that can enable farmers to produce

more efficiently. But the other thing that I would highlight here is the access to financial services that needs to come along with this, as well as education. Because it's not something that we really looked at in our solution.

Tim Yup, absolutely. Appreciate that. And so let's maybe talk about a success story here. So the GFSI report showed that Tanzania was a country with the most improved food security environment. Its scoring increased by about 13 points between 2012 and 2021, and it rose 21 places to 86th position overall. It's a lower, middle-income nation that's dominated by smallholder farming. Can you tell us how they achieved that progress and what they should do to keep the positive momentum? And are there takeaways that are relevant for other countries?

Pratima Yes, absolutely. I think Tanzania has been a really interesting example to monitor and to analyze in the past few years. I am going to pull up my screen where you should be able to see the GFSI website, so I can show you how we can I guess dissect some of this information online as well. So we can go into the slide Index in rural countries. This will allow us to have a deep dive into actually all 113 countries. But let's for sake of time jump right into answering your question. And looking at Tanzania here, Tanzania, as we mentioned, improved significantly. It is now ranking 86. It was large, so there's still a lot of room to grow out of a hundred, still relatively low in terms of the ranking, but it made significant progress.

So if you look here, these are the ranks in the individual categories. You'll see it's still lagging behind in natural resources and affordability, some improvements in availability, and still some room to grow in quality and safety. What you see here is essentially, it's made some significant commitments to food security, and that's really helped in improving the availability score. You can also take your down here and for an interesting tool that we play with in order to visualize some of this data. So here we've got Tanzania highlighted, along with its regional peers in sub-Saharan Africa. And you can see the overall score and maybe how it does in affordability, because we know that affordability is an area that they need to improve. So there you will see how this is quite closely linked and in Tanzania somewhere along that line in improving its food security. So it's got room to grow both ways, and to the top right and the corner.

Let me jump into the model again quickly to show you exactly what's happened in Tanzania and what we can learn from it for other countries that can be extrapolated here. So let's select Tanzania here, check the comparison years 2012. We see the overall score of 48, as we mentioned, improved by 13.3 points, which is a tremendous improvement over the past ten years. Natural resources have unfortunately declined, and so we know that there is still improvement that can be made here, particularly around political commitment to agricultural adaptation. It's improved in availability by 19 points. As you can see here, it's further from the other end of the spectrum when it comes to what we have seen here for Denmark where volatility is very high. It's managed to manage and contain some of that volatility, and that continues to continue being a focus going forward.

But where we've seen the most improvements for Tanzania are in the affordability category. And in particular of course we see improvements in food safety nets and also market access, but in particular we've seen improvements in average food costs.

We've seen that the country has been able to manage this incartier, because we know for a fact that high food costs are very closely linked to food insecurity. And so it managed to bring that down for its population that's allowed the country to improve in food security, as well as improving things like sufficiency of supplies in order to make sure that everyone is achieving as high an adequate caloric intake as necessary in the country. So those are a couple of, I guess, reasons why Tanzania has improved and kind of what we highlighted in the presentation as well, we've seen it driving food costs down, improving access, and food safety nets, and then in sufficiency of supplies. These are some metrics, and some of the areas that countries can focus on and learn from, in order to improve their food security environment going forward.

Tim That's great, excellent again and a great example and really highlights the depth and utilization of the data there. So I want to take us in maybe a little bit different direction here. So just last week on October 15th we celebrated the International Day of Rural Women. The day was established by the United Nations to recognize the critical role and contribution of rural women in producing food, building agriculture and rural development worldwide. And I'm proud to be the executive sponsor of the Women's Inclusion Network at Corteva. And we believe that inclusion, diversity and equity is important not only for women employees but also for women farmers and all women who work up and down the food value chain.

So I'd like to open up a question for the audience here, a poll question. And the question is around gender equity and agriculture. So how many countries have improved in gender inequality since the first iteration of the Index in 2012? So a really important question here. We've got three options—25%, 45% and 96%. So let's take a second and type your answers into the chat, please.

So this answer surprised me in a very positive way, and the answer is 96%. So based off of surveys and feedback we've heard from rural women, 96% feels quite high. We know that there are challenges in different parts of the world in terms of women getting their access, the information technology and certain resources. Can you show us what the findings are for this relatively new indicator? And what can we learn from the 2021 Index regarding the impact of COVID on gender inequality?

Pratima Yeah, so as you mentioned, this is an indicator that we, in fact, included in the 2020 Index for the first time. Because essentially we know for a fact that gender inequality is very strongly correlated to food insecurity. And so we want to make sure that we are incorporating this social barrier to food security as part of our Index as well, in order to really…, as it is a very poor driver or factor of food security. So last year we updated the framework and came to the methodology to include this indicator. And what we do when we include a new indicator is essentially we backdate all of our scores as well to make sure that we're enabling year-around, year-out or performance evaluation. And so we essentially made sure that we updated the entire model and all the scores in order to reflect the updated methodology.

So with that I'll show you the findings of what we found as a result of gender inequality, including this metric, but also what we see gender inequality across the world. Like you said, the 96% is a really interesting number, simply because I mean there's still a lot of work to be done on this particular factor. So I'll start by showing you this is the map where you can see how countries fare or score in their gender

inequality metric. And so there you see the countries that are better with the yellow and the orange spaces where there's much more need to grow. So there is still a wide variation between the countries that are doing significantly better and those that are still lagging behind. And I'll show you this by highlighting what we're seeing sort of as the top performers. We see again a lot of European countries—Switzerland, Denmark scoring 97, while on the other end of the spectrum, countries like Chad and Yemen and Mali, they score only 20. So one thing to note here is that that 96% of folks we're seeing improvements—and you see on the right-hand side the countries that have made significant improvements since 2012 on this particular metric—but that said, there is a wide difference between the countries that are leading this and the countries that are lagging behind. And so we know, like you mentioned, that improving gender inequality in our rural areas is critical in order to promote food security. And so I'll show you a little bit on the ranking, as well as you can see most countries have improved on this metric. There are some reds in here, and those countries need to prioritize improving gender inequality. And the reason for that is, I'll show you here something that we know is very significantly correlated to overall food security; because as you can see on this particular status lot… I guess gender inequality you will see that there's a very strong correlation between gender inequality and overall food security, and it's a negative correlation. So the more unequal a society is, negative 0.8%, the more unequal a society is, the more likely they will be food insecure. And so we know that gender inequality has deteriorated as a result of ___. Women tend to be more affected by economic shocks. We see this all the time, whether it's economic shocks, lack of safety nets, because of supply chain bottleneck as a result of over-___ restrictions. Now, women tend to be more employed in the informal sector as well. So all of these factors exacerbate the pressures and distress on rural women in particular. And so we can, we've seen that this has in fact deteriorated following COVID. And it's a really important metric to prop out in order to improve your food security environment.

Tim That's great, and I think we can feel good about the progress—96% is a great number, but we still have a long way to go, as the map and the data highlighted. So I really appreciate the context there. So maybe I'll switch to some audience questions here. We've got several that have come through. So one question here is around how we ensure that the GFSI evaluates all people. It's well known that the data is only as good or accurate as the process for collecting it. And how do you evaluate food insecurity among people who don't have access to the survey tools? Is the data disproportionately representing certain demographics?

Pratima Very interesting question and also something that is very much something we've been examining, because the Index as good as authority of the data. And so what I want to find out here is… This is a tool or an Index determining the driving factors of food insecurity. So what we are trying to examine are—what are those specific areas that allow a population to be food secure or not, or lack thereof. And it's all based on the Rome Convention, the summit in '96 that talks about how all people need to have equal access to safe, healthy, nutritious food that is affordable. And so it's all based on that. And what we are trying to do is really examine those drivers in the context of food security and for these 113 countries. And there are a couple of different needs to be sure that we're capturing the entire population and it's not just representing one particular sub-group or segment. Well, basically we look at a quantitative metrics that are basically gathering from the FAO, from the U.N. and other places that aggregate

this data. And so we move the collective to that are over time and of course in partnership with governments as well. And then the same sort of metric or type of metric, group of indicators that we use are for quantitative indicators where essentially when we are looking at whether countries have specific policies in place, whether they have certain standards in place—that we then have a team of researchers that go into individual worksites to examine whether there is evidence of this and are then populating the Index with that updated data. So essentially what we are trying to do is really spend time and looking for the right types of indicators from the right sources at the right time to ensure that we're making this as realistic as possible in an effort to measure the drivers rather than the outcomes of food security.

Tim Very good. Thanks, thanks for going deep on that. And we're doing well. I think we'll have time for one more question from the audience here. So in terms of a question here around just sort of maybe a difference between the Food Security Index and another sources. So according to the FAO, four pillars of the food security used to be around availability, access, stability and utilization. And when you look at quality of natural resilience in terms of GFSI, you know, should we think of this as an upgrade on that curriculum, or is it really specific to the GFSI?

Pratima So at this point it is specific in the sense that we know that there is a need to make our food system much more sustainable. And so we know that this is not something that we're doing in isolation. This is everyone is calling for more sustainable food systems. We've used the '96 World Food Summit definition and incorporated natural resources, because it's important that we don't think of these issues in isolation. We know that natural resources and risks as a result of climate change are impacting farmers. We know that that affects in produce food, but we also know that farmers tend to be some of the most food insecure people in the world. And so by incorporating this, we are essentially need to do, and ensure that those two dialogues do not happen in a way that sort of…, that's connected but sort of linked, rather than making sure that we can inextricably link these two issues and make sure that we're talking about this in a way that is much more cohesive rather than in cycles. And so I would say it's an effort to make sure that we're building a more sustainable and secure food system.

Tim Okay. Well, let me take one more second here and ask another question, and I think we'll be able to slip one more in here. So many of our viewers today might have attended the earlier session on research and development where the Corteva Chief Technology Officer talked about regulatory certainty. And what does the Index tell us about R&D and the importance of regulatory certainty in terms of food security?

Pratima Yeah, so we do incorporate R&D as well as regulatory factors. So you'll see here… the regulatory environment and also whether people… It's not just about having food available, it's also whether people can have access to that available food in order to determine food security. And so we do incorporate things like political and social barriers to access. That includes a number of different metrics, say political stability risk—that is of course very closely related to regulatory certainty or lack thereof in certain countries. And there you'll see on the map of course some of a snapshot, I guess, of regulatory risk, and political stability risk. We also of course look at things

like armed conflict. We know that armed conflict is a big, big factor in driving food insecurity in a lot of countries.

And then we're going to move to the last one, which is production. And there you'll be able to see some of these countries where you have very low risk for countries like Canada and Australia. And here is the overview changes that you can see. Australia and Canada, countries that have been significantly strong in this environment. But I do want to call out some countries that have improved quite a bit over the last ten years in this. And so you see countries like Colombia improving. Colombia is in fact a case study in our research report as well, where we talk about the benefits of having a more stable and less corrupt government in order to improve food security. And so it's a very critical factor, regulatory certainty and political risk and one that we incorporate in order to link to of course things like technology but also overall food security.

Tim That's great. So we're getting close to the end of our time, and you've provided a great number of insights today. And clearly we have a lot more to explore. So one more question for the audience here, and I think this is an easy one, because there's no right or wrong answer. But from each individual—what do you see as the most important of the four categories as being most urgent for your country in terms of addressing food security? So we think about affordability, availability, quality and safety, natural resources and resilience. So maybe take a second, and if you can type your answers into the chat.

And I think we'll see lots of views on that question, and again there's no right or wrong answer. It really is about stimulating discussion and continuing the dialogue as we move forward. So, Pratima, you've shared a tremendous amount of information today. You've helped demonstrate the value and impact that this tool can have. Do you want to share any last comments to our audience today?

Pratima Yeah, I want first of all thank everyone, thank Corteva for sponsoring this Index for the past ten years. I want to thank our audience for taking the time and spending this morning with us, talking about a critical issue like food security. Please visit the website for more details. We want to make sure that this information is used, and so with the model, I hope this is helpful in explaining how we can use this tremendous amount of data. And I think it's just like maybe a little thought, but we've made improvements, but we need to continue. We are seeing some slowdown if not a decline, and so it's critical that we continue making more progress as we look to solving and achieving the U.N. SDG of zero hunger in the next ten years. We've seen what's happened in the past ten years, and we need to reverse some of the decline that we are seeing, in order to improve this environment going forward. So thank you for joining us today. Back to you, Tim.

Tim Thanks, Pratima, and just looking at the chat, seeing a lot of discussion around maybe two points. Two of the pillars really stand out—quality and safety, and it seems like natural resources and resilience have stood out there. So really, once again, thanks for the insight and discussion today, Pratima. You know, it really is a great reminder, the urgency, the importance of this issue for people everywhere. I want to take a moment again and thank our audience for taking the time to join us today. I invite you to continue to collaborate with us and each other by bringing innovations forward to

help farmers and really working together to apply meaningful, science-based solutions to the growing crisis that are faced by people worldwide.

I want to thank the World Food Prize for this week, dialogue and especially for including this important topic, and really congratulations for a great week of important discussions. And, finally, one last reminder—If you haven't already, please download the report that's listed in the chat. I think you've seen the importance, the significance and the amount of information that's shared there.

So Corteva is honored to sponsor the Global Food Security Index once again. We're honored to host you today, because now more than ever we need to spotlight this issue and renew our collective commitment to innovation and collaboration for a better food system. Once again, thank you and have a nice day.