

The expert view: a discussion about climate change adaptation & disaster risk

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Dr Prabhakar,

Thank you very much for making the time to discuss [climate change adaptation](#) (CCA) and [disaster risk](#) with me, Dr Prabhakar. Could we begin this interview by summarising your background and experience, and the work you do?

***SVRK Prabhakar:** Sure, and thank you for the opportunity to discuss aspects of climate change. I am a Principal Policy Researcher at the Institute for Global Environmental Studies (IGES) in Kanagawa, Japan. My work for several years has included a focus on climate change adaptation and disaster risk reduction (at IGES and Kyoto University), disaster risk reduction, including drought risk reduction and capacity building (at UNDP-DRM, India), conservation farming and participatory research and development (at RWC-CIMMYT, India), crop simulation modelling and farmer decision support tools (at IARI, India) and various agriculture, food and energy matters (at IGES and RWC-CIMMYT, India).*

I am a contributing author to the Asia Chapter of IPCC 5th and 6th Assessment Reports, Working Group II and a reviewer for a number of international journals in the fields of climate change adaptation, disaster risk reduction, and natural resources. My profile on the IGES website is available [here](#).

Gareth: Thanks Dr Prabhakar. I look forward to hearing your thoughts about the status of efforts to agree climate change adaptation (CCA) measures and how the world can move forwards in this vital area, along with discussing examples of the importance of evidence-based decision-making. Linked to this, I am keen to hear your views on how we can be proactive to avoid disasters of various types (partially but not entirely related to climate change), and effectively manage disaster risk.

Perhaps we can start with the status of efforts to agree climate change adaptation (CCA). I was interested to read your paper, [Operationalizing Global Goal on Adaptation: Are we putting the cart before the horse?](#) which stresses the urgency for well-defined global goals on adaptation to be agreed sooner rather than later.

There is of course a great deal of regular and often detailed press coverage about climate change nowadays. I see things happening at a specific local level such as actions by cities that are pursuing local CCA actions, often with some vigour (for example saw some good examples at a [Cities for Climate conference in London in April 2023](#)). Are *defined and integrated measures* to implement climate change adaptation (CCA) being implemented fast enough? In your article, you note that actions being undertaken in various ways around the world are putting the cart before the horse, and if we are not careful it will become too hard to track what is going on...

***SVRK Prabhakar:** There is no global coordinated goal in place (yet) for climate change adaptation (CCA). The provision for developing CCA goal/s exists under the United Nations Framework Convention on Climate Change ([UNFCCC](#)). It has been under discussion for more than a decade, but research and work programmes have not progressed far enough yet to specify a globally agreed goal or set of goals. Individual and local activities and actions have progressed and there are lots of concepts that have been agreed, but when it comes to global application, there are no technical agreements in place as of mid-2023. As an example of the implications of this, it is worth considering that Disaster Loss & Damage databases have been in place for some time to track disaster events, including those where climate change has played a role in some way, but these databases do not provide specific quantifiable details that link certain events and actions taken to climate change.*

I am [the co-chair](#) of the Policy and Finance Committee of the World Adaptation Science Programme ([WASP](#)) which is focused on ensuring that climate adaptation knowledge gaps are filled and that evidence-based policies, solutions and actions for successful adaptation to new climate conditions are properly thought through.

At WASP we are working to define in specific detail the problem of establishing a global standard for adaptation and how to distil this into practical actions, in particular: (1) what are a minimum set of indicators that should be adopted globally, and what is the minimum quality level we should prescribe, e.g. Six Sigma principles.

Gareth: Thanks for this context, Dr Prabhakar. Perhaps we can talk about work in progress to define measures, looking at risk assessments and vulnerability indexes. I have read your paper "[Strengthening External Emergency Assistance for Managing Extreme Events, Systemic, and Transboundary Risks in Asia](#)", in which you discuss a Vulnerability Index and a Climate Fragility Risk Index for global consideration, not only Asia. This paper reviews indicators from a range of organisations including Climate Central, the Food and Agriculture Organization (FAO), Germanwatch, The World Bank and the World Resources Institute (WRI). I certainly want to the status of External Emergency Assistance (EEA) with you shortly, but first, how are indices and targets for climate adaptation that currently exist being used and what are the main tools being used to assess climate risks and actions to address them?

***SVRK Prabhakar:** We can start by saying that Country National Adaptation Plans are formed from risk assessments that are undertaken at a country level.*

Conducting risk and vulnerability assessments is a major part of the global goal framework requirement for tackling climate change. Converting these risk and vulnerability assessments into effective adaptation actions constitute the second major part. The intent is that once all climate risks have been properly assessed, and ways to reduce the risk can be attributed to adaptation actions that can be implemented, the risk assessment can be used as a measurable and trackable and verifiable goal for a country.

Most countries have a Vulnerability and / or Risk Index to help them with this work. I have reviewed many country-level National Adaptation Plans, and they all refer to a risk / vulnerability assessment having been conducted, but the key is whether these assessments are being used to drive quantifiable action – and this is generally not the case at the moment. Countries tend to use their vulnerability / risk assessments to quantify the risk and agree the number of adaptation projects necessary, plus the necessary funds to implement them, but they don't then use the assessment as a mechanism to establish and monitor the achievement of a measurable climate goal. We have not yet finished the first cycle of national planning and implementation of these plans, and many countries are still agreeing their National Adaptation Plans and still forming teams to tackle the challenge. Others are still finalising their reports. There needs to be a time period for countries to implement their actions. Perhaps we are still four or five years away from knowing the effectiveness, to come back to those risk assessments and see what happens.

Since many countries are not thinking about their climate change adaptation actions in a quantifiable way, there is a limit to which we can directly link and attribute the effectiveness of adaptation actions to address climate risk. The key point I want to make here is that there is currently a disconnect between the risk assessments that are undertaken and the adaptation solutions that are put forward and are being acted upon. For example, if part of a country risk assessment is that there is an identified risk of there being a 10% reduction in rainfall in the country due to climate change (backed by science-based evidence), adaptation solutions put forward could for example be (1) to increase the irrigation area and (2) increase the amount and extent of drought-resilient crops (which will require various actions to achieve). Whilst these actions intuitively make sense, risk owners need to ask themselves: are the actions we have agreed addressing the risk of the 10% reduction in the rainfall in a measurable way, and at a detailed level? Currently, there is a lack of quantification and correlation between actions being taken and the effect they are having, and the risk that has been assessed. Actions tend to be described in a qualitative way with qualitative targets. In my rainfall example, it should be possible to identify and agree specific local locations to plant drought-resilient crops, and locations to expand irrigation facilities and to measure quantifiable impacts. However, many actions today are patchwork responses that do not translate into the amount of risk they are directly addressing. The risk is quantified, but the interventions are not quantified.

Gareth: Thinking about this important point you have made about the need to ensure specific quantifiable metrics to track actions that link back to quantified climate risks, I would be interested to know what role Earth observations could / can play to support the quantification of measuring the effectiveness of adaptation actions.

I am asking this because part of my work in disaster risk reviews how Earth observations can help with the proactive management of disaster risk, including how we can avoid disasters from happening. I am not suggesting that Earth observations are the sole way to monitor quantifiable climate adaptation targets, but could they provide good evidence-based to monitor some quantifiable outcomes, such as specific locations where activities are undertaken?

SVRK Prabhakar: *The use of Earth observations could be part of a response to track quantified outcomes to address climate risks. Earth observations are in my experience typically used for identifying risks and solutions options (for example, flood patterns and ways to minimise flood risk). Addressing the matter comes back to how identified solutions can be linked back to identified risks to show their effectiveness in a quantified way. This depends on ensuring there is a translation of the risk into exact, precise solutions. The connection is too loose at the moment (per my point earlier).*

Coming back to our rainfall example, some might say that we do not need huge amounts of scientific analysis to implement better and expanded irrigation facilities or drought-resistant crops to areas that are at risk of experiencing less rainfall, but I would argue that we do need to know specifically how a solution is addressing a risk in order to see how much value the action is adding, and whether it needs to be changed if that value is too low. For example, if new irrigation facilities are recycling water coming from upstream, is that actually addressing the risk properly or is it just moving the problem from one area to another, perhaps with the problem being more pronounced with seasonality (i.e. time-based changes)? The variability of degradation upstream may not be considered in the downstream solution (it may not be “their problem” to address downstream). If we just look at total rainfall upstream and total rainfall downstream, and we redirect water from upstream, we can say that we are providing more water downstream, but this is probably to the detriment of the ecosystem upstream. In this example, actions and risks are not empirically well connected, so things get lost in attribution back to the quantified risks. What we should be doing, and what we need to do more of, is to get into specific logical detail to track measurements of our actions which tie back to the risk assessments undertaken.

Gareth: I can see the importance of agreeing how to quantify all adaptation solutions and follow up with monitoring to check whether quantified targets are being achieved and whether they are having the intended effect on the risk.

Noting the timeframes that you mentioned earlier about seeing how national adaptation plans are rolled out, is part of the plan to offer guidance or an advisory procedure with recommended ways to quantify actions against risks? As a risk consultant, I am a keen advocate of this approach and I use a variety of tools with teams I work with to work through controls and actions to manage risk that enable actions to be quantified, sometimes against a range of scenarios.

For example, is there an opportunity to work with the country owners of national adaptation plans and/or vulnerability / risk assessments to agree how actions will quantifiably map to their risks? Could this help to align the actions of stakeholders at different levels – at the country government (and therefore policy) level, in states, cities, towns and maybe actions by the private sector also (the latter might be complicated to integrate, I suspect – but I think about the emissions from various industries, from shipping to steelmaking)? I am also wondering about linkages to diagnostics reviews that get undertaken around the world, such as urban diagnostics for cities for example.

SVRK Prabhakar: Yes, if we can establish connections between the risk and adaptation actions in a robust manner, we can work out how to ensure adaptation measures are properly quantified. If we can engage with actions in national adaptation plans, that would help us to understand how things can tie together.

Gareth: I can see the importance of ensuring that the action to quantify actions links to a holistic and rounded definition of value, which incorporates economic, social and environmental aspects.

SVRK Prabhakar: Yes, we must have feedback mechanisms in place that look at economic, social and environmental measures. The impact on livelihoods is a big issue, for example. Livelihoods around the world are diverse and dynamic, and there are many aspects about them that do not appear or get counted in economic terms. For example, farm labourers and agricultural income is not well quantified and understood, and not factored into national-level economic calculations very well (educated guesses are often made about it).

Gareth: Linked to this point about the definition of value, there is a fundamental question of whether GDP is the right measure to be using for prosperity and value, since it does not truly recognise social and environmental value. I review the approaches and thinking of economists such as [Mariana Mazzucato](#), for example, who write about what we should be defining as value moving forwards.

SVRK Prabhakar: Yes, there is a lot of debate ongoing about the value of GDP versus other ways of measuring prosperity. Income inequality is something that GDP does not represent well. GDP can be high but if your Gini coefficient is high, it means there is a lot of income inequality.

Gareth: Meanwhile, to your point earlier, the world continues to move forwards, and in some respects regress backwards with actions it is taking to address climate change and to adapt.

SVRK Prabhakar: *Yes of course. Risk assessments are not done in a vacuum. As you mentioned just now, as well as the national-level vulnerability / risk assessments, other assessments are being carried out and used for specific needs and specific local areas. A local project that is conceived for a particular area or city/cities in a country will probably have some form of risk assessment done by the party that is managing it, and part of this assessment will no doubt incorporate climate aspects (depending on the scope of the project). As of today, this activity is probably not linked / connected to a national climate risk assessment, so as a result we unwittingly create assessments and actions being carried out ad hoc. I am not criticising the work that is undertaken in local areas; it is valuable and necessary. I just think that we need to ensure there is interconnectivity between all assessments that look at climate risk and vulnerability across all levels. We need to establish a way to bring activities together at a combined local, state and a national level so that mainstreaming and connectivity can be achieved. If not, the national risk / vulnerability assessment can become outdated and maybe even useless the more that disconnected projects are undertaken. If local activities are done on separate local risk assessments, and the national risk assessment exists aloof on a disconnected and different geographical scale and time periods, it is an opportunity lost to create value.*

Gareth: Would / could a common database for risk assessments that is agreed as mandatory to use help with this? I don't know if it would do, it's just a thought that occurs to me.

SVRK Prabhakar: *In my view, climate adaptation indicators are, first of all, in need of a major review. Different indicators exist across different sectors. That is why for the global climate adaptation goal(s) what we are proposing is to first define and agree what the problem is in coming up with a standard for a global goal, and then agree what we are going to do to address this problem. If we want to use a risk assessment as a metric for a climate adaptation goal, we need to have a standard and minimum set of indicators, and a minimum level of quality to monitor it (for example, adhering to Six Sigma principles). We are drafting a Policy Brief about this, being released sometime in 2023. We hope it will provide guidance on adaptation effectiveness. After this we may develop projects and submit proposals to funding donors for addressing some outstanding issues in adaptation effectiveness.*

If we do not achieve proper interconnectedness, everyone's efforts will not add up properly. If you look at how the UN Sustainable Development Goals ([the SDGs](#)) work, at the global level [the SDG global indicators](#) do not complicate matters with local level indicators. Countries look at whether the SDG global indicator and its target is relevant to them, and they work with it. For developed countries, some of the SDG indicators do not apply to them / they are aiming higher than the target, and that is fine if it is agreed. Some developing countries need to aim for the SDG global indicators in a sequential, stepped manner, so they identify their level of achievement and work towards the improvements that they agree. There can be detailed metrics beneath the global indicators, as long as they tie together.

In the climate change debate, we bring in a lot of uncertainty to the discussion such as climate change projection uncertainty, which complicates our efforts to agree goals. This is, I think, a key difference with the SDG global indicators and where we are currently with climate adaptation goal/s and indicators. The SDG global indicators are set metrics whereas for climate adaptation we still need to agree on some things at a foundation level. We need to move forward from focusing on the uncertainty levels.

Climate change adaptability should not be thought of as any one number: it should be thought of as existing in multiple forms – for example, three areas or categories to think about can be (1) a reduction in vulnerability, (2) an increase in adaptive capability and (3) a reduction in climate risk. If things get miscalculated at the policy level, it makes it hard to agree focus levels.

Gareth: Thanks for this explanation, Dr Prabhakar. I know of and see scenario analysis used by teams looking at how they anticipate responding to different levels of climate change. I am not sure if scenario analysis would be useful to be linked to particular climate indicators.

In terms of the discussions ongoing in countries at the moment, are you involved with any country teams that you see taking a proactive approach to address climate vulnerabilities, and perhaps also other aspects of disaster risk?

SVRK Prabhakar: *One example that I will mention is Indonesia, where they have come up with a Vulnerability Index and a set of indicators for it. The idea and intent is for the index to be used in a similar way to how the SDG global goals and indicators are used, to cover a range of aspects.*

I recently talked with the professor who is spearheading this initiative, and I asked him to what extent this new index can be used for real in adaptation decision-making, and to monitor the progress of actions in a quantifiable way. It is still in the formative stages, but work is progressing.

When governments undertake initiatives, the extent to which they undertake true in-depth consultation is key, and I see that it varies greatly around the world. Consultation can be seen as “just consultation”, meaning that people who attend such consultations may not speak or object at the time but then, when policies and actions are brought in, they end up not being pursued because of some other problems or blockages.

Gareth: Thanks for this context, Dr Prabhakar. Could I ask what linkage / role in all this the IPCC AR6 reports have?

SVRK Prabhakar: *The AR6 reports have taken a considerable effort to produce and disseminate. Coming up with the reports as science has evolved, and continues to evolve, has been a huge task. They provide broad guidance in many areas, and they are not focused on prescribing specific or particular actions.*

With these reports, countries should have all the incentives they need to move forward with climate change adaptability work, and their country-level reports. They know about the events that are happening in their country and they have science-based evidence to support the position they are in.

In our discussions with national governments, there is no scepticism about climate change. Their main focus now is how we agree and implement the right investments. Developing countries want support from developed countries, but they also know that they need to work out ways to organise their own funds in order to stop flooding, droughts, fires and other potential disaster situations and events affecting people.

Gareth: We discussed earlier the efforts from a broad range of stakeholders towards climate adaptation, and that there is a lot of good action taking place to introduce actions to prevent disasters from floods, droughts, the effects of heat and other situations and events, albeit not empirically linked in a global way.

In your paper about managing External Emergency Assistance for disaster risks, you talk about critical thresholds. I am wondering if a focus on avoiding disasters as much as we can with EEA can unlock funding early to avoid a disaster when a situation or event is apparent, and to use proper metrics to prove the value of doing this.

SVRK Prabhakar: *Our intent of this study and paper was to look at the activities of the Japan International Cooperation Agency (JICA), which is the biggest ODA donor in the world. The JICA policy is, broadly, to respond to situations upon request. Japan is dependent on many countries for goods and services, and it makes sense for them to support vulnerable countries in a proactive way. In our EEA study we noted that the Japanese policy was not ideally suited to the proposed early relief approach (whilst appreciating that it does many things very well). The early relief approach can work for other countries that voluntarily and proactively provide relief measures.*

Key to maximising the value of any international relief support, and to help to avoid a disaster occurring through the long-tail impact of an occurrence of some kind, is knowing what kind of help a country / local area really needs.

For example, consider an example of a major typhoon approaching a known area – such as a particular part of India. Similar to impact-based forecasting, when a typhoon is approaching, say, Delhi, data is available about a known population, the infrastructure that exists and the quality of building and construction. Analysts know that if a typhoon falls in a particular location, the extent of likely damage can be estimated, and as a result relief support can be proactively provided / on standby to support specific measures. This proactive action can save a lot of time and resources, and of course save lives.

Too often, countries are unfortunately receiving the wrong kind of relief support when a disaster event occurs. Heavy clothing for example may be sent to a country that has a climate that is too warm to use it. Relief goods and materials get damaged and thrown away, or they are unfortunately not useful to those who are affected. Countries are developing better guidelines to stop this happening. For example, rather than receiving food packets, they may need cutting equipment and robots to help clear debris. For the donor country, knowing the threshold that a country will use to call for assistance is valuable.

Gareth: Do you think that if we look forwards, there will be a greater focus on how we can fund and implement pre-emptive measures to avoid finance, with intelligent finance.

SVRK Prabhakar: *Yes, and there are examples in place today. IFRC has a program called the Disaster Response Emergency Fund ([DREF](#)) which uses forecast-based financing approach.*

One aspect we need to think about is where specifically disaster relief material is being sent to. In some cases, it is being sent to a specific disaster-affected area, which is not logical because when a disaster happens, if you are putting up storage facilities directly within an affected area you may not be able to distribute them properly, and local people who are affected may not be able to access them either. Relief material should be stationed on the periphery with an agreed means of access and supply established (which might be where the delivery of cutting equipment and the like from international donors can be highly valuable). Continuing with our typhoon example, before a typhoon season we need to assess the local resource availability and of course utilise Earth observations including weather forecasts, rainfall predictions and early warning signs to ensure good relief measures in peripheral areas are in place. Plus, we should agree how we can quantify the value that they add in specific ways.

Also, more broadly within a country or a state, perhaps there can be sister city partnerships and supporting neighbour agreements in place so that affected cities / towns can help each other in pre-agreed ways.

Gareth: I was going to ask you about the concept of cities and towns agreeing how they can help each other as part of urban resilience and disaster risk planning. I think the same thing can apply to having agreements in place, ready to use, with the private sector?

SVRK Prabhakar: *Such agreements do exist, between cities and with the private sector. In Japan for example, forward contracts exist between the government and contractors. If there is an earthquake and a bridge collapses, expert companies can get to work quickly knowing that rates are agreed in advance. The government does not need to wait to agree such things.*

In the aftermath of the Tohoku earthquake of 2011, a lot of transport infrastructure was reinstated quickly because of the work done on forward contracts.

Gareth: Thanks for these examples, Dr Prabhakar. I mentioned earlier that I attended a cities for climate action event in London in April 2023, which had speakers from cities around the world giving good examples of action being taken for climate adaptation and related matters such as addressing and improving air quality. The focus in this event was on cities in developed economies. I wonder about the resources available for fast-growing cities in the developing world, and whether they can get things right.

***SVRK Prabhakar:** Air quality is not necessarily a high-tech area today (though of course some high-tech equipment does exist). Having a nationally coordinated approach to improving air quality is not easy, especially in developing countries. There are some good actions in place. For example, many cities in India track and monitor an air quality index. Regular (not top end) air quality monitoring equipment is cheap to purchase and use. Cultural adaptation to improve air quality is happening (for example, less burning during festivals), however, local governments still blame each other for times when air quality is poor. City states blame the problem on neighbouring agricultural states, which the agricultural states refute. Technical studies are well established for example that wind movements play a large part. It's the effectiveness of interventions that is the key.*

Gareth: This is a good example of links between climate change adaptation and disaster risk. India is an example of a country that is having to deal with persistent levels of heat which are at even higher levels than it has had to deal with until now. I know there is a lot of focus by the national government on Heat Action Plans, yet a review of them was undertaken recently which said that there were quite a few problems with them, and that part of the problem involved a lack of good data, which I think links back to one of your key points in this discussion about there not being enough focus on quantifying the impact of actions to address climate change and also disaster risk (regardless of whether they are interlinked or not).

***SVRK Prabhakar:** Well, perhaps we can consider an example of an agreed action in the India Heat Action Plans like the draft cool-roof policy which has been written by the state of Telangana. The idea is good in principle and can be pursued, but as is the case with many other policies, I have not seen an empirical study that looks at what happens with particular types of paint, what the temperature reduction will be in different weather conditions and specifically how effective it is. This includes knowing what its effectiveness is on different structures that it is applied to – concrete, brick or another surface, and what will be the actual overall reduction in temperature across the city as a result of applying paint? Cooling paint will work only if it is not dusty. It will darken, the effect will go away. If there is rainfall it won't be as effective.*

I wonder how effective these cool roof paint solutions will be. Time will tell.

Local governments can make use of policies like this to get funding through the system, but they might not be the best policies. They may look good on paper, but without detailed analysis we won't know if they are the best solutions and the best use of available limited resources.

To give you an analogy, I invest every year on waterproofing paint for a house I own in India. The manufacturer says that the paint should last for years, but after each rainy season a new coat of paint is required. So, the next year I have to buy paint again and get it applied again. Waterproofing technology has existed for decades, but even with this technology the application efficiency is perhaps 10-20%.

Gareth: I appreciate your views on this example, Dr Prabhakar. It strikes me as an example of how a detailed risk assessment on a solution (in this case, cool roof paint options) and a What if? analysis, perhaps combined with a PreMortem exercise to imagine how it could go very badly wrong and be a complete failure. Perhaps it can ensure that people always think about different solutions.

SVRK Prabhakar: *I believe that solar panels could have made a lot of difference (and can still do so if they are implemented). They could be in place for years and if the government invested wisely in solar panels, it could produce a lot of crucial electricity for the city which will last longer than paint.*

Gareth: I also wonder about Nature-based Solutions such as growing more canopy cover (something that I know Hyderabad and the state of Telangana are focusing on) and greenery to limit the urban heat island effect.

As a final question, can I ask you what you hope can be achieved in the next seven years, up to 2030 – the top one or two things that can address the most important points on climate adaptation and disaster risk.

SVRK Prabhakar: *I would say that my main hope is not related to anything that we have not already proven can work. I see a lot of these things as a scaling challenge – we have solutions that we need to scale up, learn from and apply tweaks to local needs. It is not a case of one size fits all. It's about targeting solutions for each particular need (which risk assessments help to inform us about). Can governments implement their policies at the level of individuals and households (and businesses)? This will enhance the quality of them. In the developing world we lack individualised data and do not have a sufficiently targeted approach. Broad statements about eliminating poverty and improving education are not useful on the ground. The way policies are currently driven means that some gain a lot, and some lose out a lot. This "winners and losers situation" is a major problem with policy targeting today. Our adaptation policies will not work if we do not get down to the individual level for people's needs.*

Another key point is who owns the risk. This debate needs to be brought into the public discourse, and it is linked to my point about ensuring policy works at the individual level. Ultimately, it's about good public policy and governance, from agriculture to disaster risk. The state cannot own everything, and it cannot know all the micro-level detail of people's situations. Every individual needs to know what risk they can underwrite and what they can pass along. We are not at this point yet. Many people seek to pass on the risk, not bear any, yet that is not reality. Even if you are paying for insurance, this is not the answer. Insurance is a market mechanism designed to respond to specific situations and occurrences, and we cannot apply it everywhere for everything. So, ownership of the risk is key, with people knowing and understanding the real effect of risks they face and what they can practically do to mitigate them at their own level. It comes down to making policy effective at the level of the individual (by which I also mean a family, or a small business).

Gareth: Individual action to own risk, from the ground-level up, has to be a key focus point. We can all act if we can see the urgency in front of us, and what it means to our own lives.

Thank you very much for your time, Dr Prabhakar.