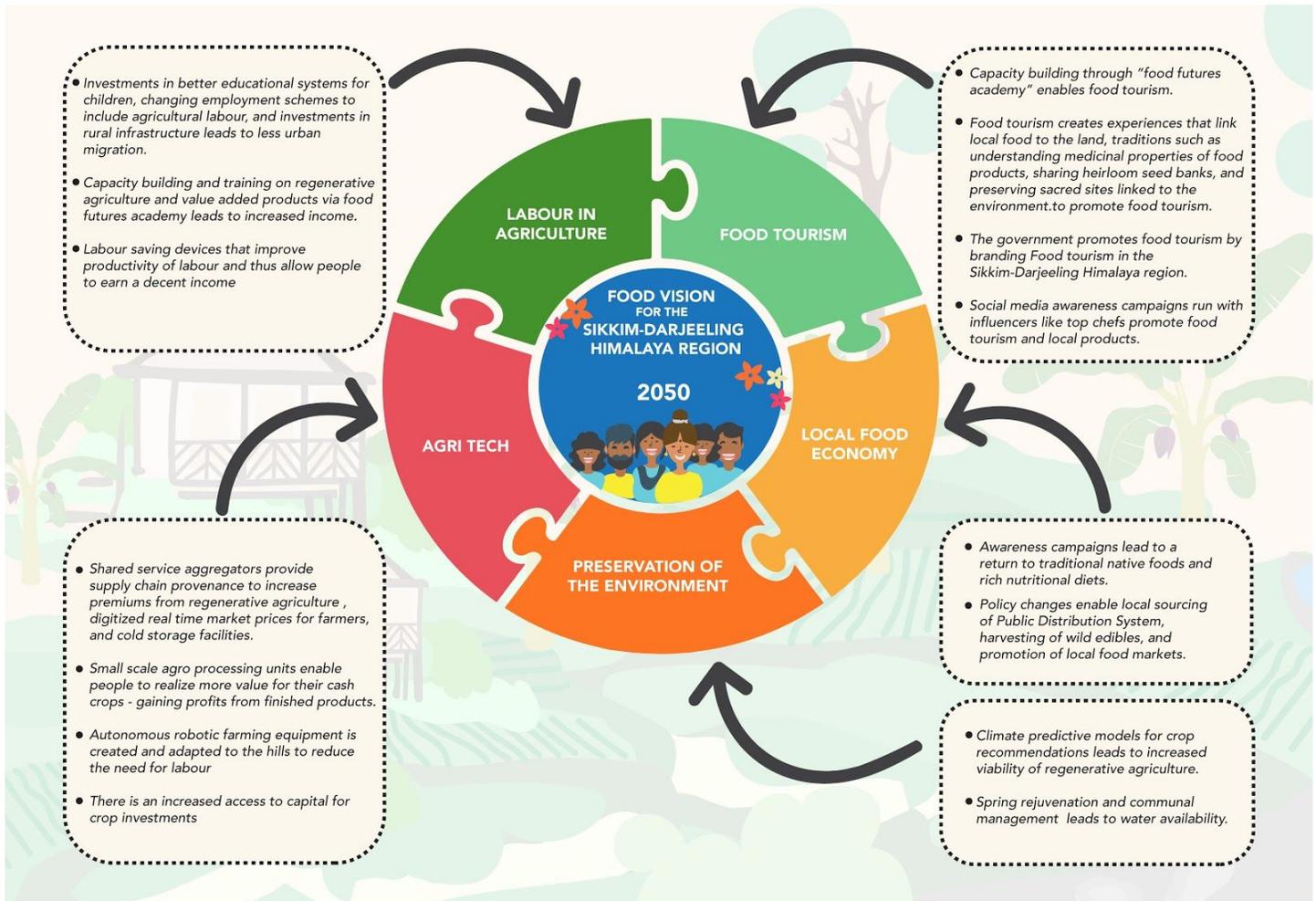


OUR VISION

Our vision is that the Sikkim-Darjeeling Himalaya region will ensure sustainable livelihoods and opportunities for all while preserving the environment and achieving food and nutritional sovereignty. This will be accomplished through a successful model of smallholder agriculture, supplemented by value-added and off-farm entrepreneurial activities that are driven by responsible tourism and the strengthening of local economies.

Here is a visual summary of our vision:



To better communicate the impact of this transition on the lives of different stakeholders in the food system of 2050 we have used a storytelling approach. We describe the daily life of several characters, narrated through their lens. These are obviously fictional characters but are loosely based on our field interviews with actual people.

Daniel Lepcha (60 year old small hold farmer):

I know most people hate getting older. But I think that's because they haven't lived a full life. That's something I praise Nozyongnyu every day. When I was young, I never dreamed that being a small farmer living in Passingdang Village, I could live such a fulfilling life. But now, at 60, I have no complaints. Why would I? I have a beautiful family, grandkids who I see every day, a thriving farm with good yields every year, a homestay business, honey business, and I live in one of the most beautiful places in the world. Although I haven't traveled all around the world myself, my daughter, Roshni, has, and has told me. She's a famous chef and social media influencer you know! I'm so proud of her. She lives just a few houses down from me. My granddaughter keeps trying to teach me about the latest mixed reality technologies so I can communicate with Roshni when she is traveling, and maybe one day I get it, but I still prefer my good old iPhone 25x for video calls and Whatsapp. Those were the days! I still send good morning and good night messages to all my friends. My granddaughter calls me a fuddy duddy. I tell her that's the Lepcha culture. We stay connected to our family and friends.

It's those small decisions in life that make all the difference, and change the course of your life. When I was 35 years old, I remember I was debating whether I should move to the big city, Kolkata, or stay back in our ancestral land. I had a wife and 5 year old daughter to think about. People said education was better there anyway. Our tourism business was taking a hit. We had given up our agricultural land about 10 years before that to start a homestay. It was a very tough decision. I remember my exact age and the year (2020) because of the Covid-19 global pandemic. For better or worse, the decision was made for me. Everyone from Kolkata was coming back to Cz. What was the point of trying to go there? I was feeling quite desperate actually. How would I survive? Food supply chains were broken. Nobody knew what to expect. We had no idea if tourists would ever come back here again. But my friend Sonam Bhutia heard about this free seminar called "Food Futures Academy" - put on by Ashoka Trust for Research in Ecology and the Environment (ATREE), and he convinced me to go. I was resistant at first but then I decided, why not? If they could tell me about the future I guess I should listen. Anyway, Sonam was always the top of his class so I trusted him with things like that. Today, he is the Agricultural Minister of Sikkim! I knew he would be famous one day!

But like I said, it's those small random decisions that change the course of your life. That weekend changed the way I looked at food, and my potential living in Passingdang Village. I realized that through regenerative agriculture and precision agriculture I could not only grow cash crops, but I would have enough for basic food crops too. All while ensuring we protect Itbu-moo (mother nature). And I learned how to start multiple streams of income besides tourism, how to manage my books, advertise on AirBnb and Tripadvisor! I never even thought of an apiary business.

Anyway, I applied, and I got into their full course. Regenerative agriculture is the norm now, but back then, nobody had heard of it. Everyone was moving to hybrid seeds and chemical agriculture and getting into debt. My parents were still pushing me to go and try to find a job in Kolkata, but I took a chance and I decided to stay. And I'm so glad I did. Today, even people who leave, keep their ties to the village. But back then we didn't have a lot of opportunities here, or good educational institutions. In fact, there were so few people that stayed in our local area that there wasn't enough labour to make farming financially feasible! Rural urban migration I think they called it. But obviously now things are completely different- most people living around here chose to stay around here, I mean why wouldn't they? My granddaughter laughs when she hears about how -- she calls it "basic" we were, when we were growing up. She can't even imagine not living in our

ancestral home. But going to the big city was all the rage back then, and getting a job in a call centre, working from 9 pm to dawn.

It's so funny how life turns out. When my friends found fancy jobs in Kolkata back in 2010 I was so jealous of them. But now, those same friends are envious of me!

Dorjee Lepcha: (30 year old smallholder farmer, son of Daniel Lepcha)

The astrologer told my father that I was born lucky. He kept telling me that growing up, and maybe it stuck with me. I don't know if I really am luckier than the next person, but I feel like I am. I live in Passingdang Village, in my beautiful traditional home made of bamboo. Did you know our ancestors knew how to make our homes earthquake resistant! Those fancy scientists in Japan and the US should come learn from us I tell you. I live with my wife, and my beautiful daughter. My father, Daniel, lives on the next parcel of land and my sister, Roshni, lives with her family next to me. My father is a smallholder farmer and my sister is a fancy social media "guider" (I think in the olden days they called it "influencer") who runs a food tourism establishment.

I get to wake up every morning, next to my beautiful wife, in the most beautiful place in the world. Even though my morning routine may be mundane to some, I love it. I get up, and check the status of my farm. I first check to see if the payments I was expecting for the vegetables, poultry, milk, and honey have come into my bank account. My Farmer Producer Organisation (FPO) connector Vikram (previously called a "middlemen") provided me with the dashboard which tracks the status of all the crops I am selling along the supply chain (based on blockchain technology) to see when payment can be expected. I usually check the prices of all products I can sell, and then I check to see how much is available for me to sell that day on the farm. I don't know what people did before real time sensing, smart contracts and digital payments! I can see what's available right now for me to sell, I can see all the prices, and I get paid instantly nowadays! My grandfather was telling me that before they would have to wait for months potentially! I cannot even imagine. But now I can see all the prices in real time and make decisions based on that.

I usually hit sell on the items I want to sell, and then hit "mik" and "harvest" to start the autonomous robots to milk and harvest. Most of my income comes from harvesting these crops, and due to the small-scale agro processing units, I can also produce final products for wholesale across India and abroad. Vikram helps organize that whole process, he's great. That's how we can use less land for cash crops, but still make enough revenue. It's also really convenient that I don't need any humans to harvest anymore! The whole system connects directly with Vikram's supply chains so it tells him that it is being produced in a regenerative fashion, and also how much is available to see. Vikram ensures I get a premium because I practice sustainable agriculture.

My wife is next to me, and she also checks her dashboard to see how many bookings she got for our adventure sports business/homestay (she manages that). She usually gets at least a few a week so she usually leaves early to welcome the guests. I usually then leave, get into my hovercraft to go and harvest the honey while I check the car's dashboard to see how many animals were prevented from trampling his fields/if any sensors need to be fixed. I could walk, but I prefer the hovercraft because it gets his work done faster. I usually want to finish quickly, so I can come home and spend time with my wife and daughter! After I harvest the honey, I leave it in the designated location for Vikram to come and pick it up.

Then I join my wife and her new guests for lunch (you never know who you will meet!). My wife is an amazing cook. Although Roshni is the famous one, even she agrees my wife's cooking is a treat. After an (always) delicious lunch usually featuring wild edibles, I usually visit my sister's voluntourism homestay. I usually run a session to teach all the guests how to harvest food for their dinner! I also teach them about our heritage, cultural practices and sometimes take them to our sacred sites as well. I love it because I learn about where they are from too. Most people don't know that much of our food also has medicinal properties! Most tourists love that part of our exchange. It's a nice cultural exchange. Then we go out and harvest as much as we can from the land designated for producing food for our own consumption. After that I keep some produce, and the rest we bring back to Roshni. It's enough for my wife to cook for our family dinner, but it won't be enough for Roshni's guests. Luckily Vikram supplies Roshni from other farms as well so she gets the freshest ingredients.

I then take leave and bring the produce home and he helps my wife cook dinner for the family. My father and mother come home, and we eat together. I then go to bed, stomach filled with my wife's delicious food, and think about how wonderful my life is. I have everything I have always wanted. I always dreamed of a simple life. But wait, I actually still have one wish left. My only dream now is to make sure his daughter gets into Gangtok University, a local university that's one of the best in the world. Luckily she is part of one of the best school systems in the country, so she has a very good chance! She can be anything she wants to be in this entire world, and she doesn't have to leave home to achieve her dreams. What else is there to want for in life?

Roshni Lepcha (Daughter of Daniel Lepcha, sister of Dorjee Lepcha) - 35 years old in 2050

Some things never change. Like a mother always feeling like she's not doing anything well. My mother used to say the same thing, and she said her mother did too. I love my work, but I also love my daughter. We just try our best I guess.

But I can't complain. The Sikkim-Darjeeling region has always been more female dominated compared to the rest of India. My father likes to say he is the one who decided to stay in Passingdang Village, but everyone knows it was my mother. My mother put her foot down and that's what happened. She was the one who primarily ran our homestay back then. And what my father likes to leave out is that he never actually finished Food Futures Academy! He actually dropped out, and my mother finished it! She is the one who started the apiary business and focused on getting our farm back.

Don't get me wrong, I love my father, but really, I have my mother to thank for where I am today. My mother was an excellent cook, and she was the one who started giving people food tours, and I started helping her source business through social media. I guess I was good at it. Today I'm what they call a "guider", but they called it "influencer" back then. I took over the business about 10 years back, and ensured that all our food was being sourced locally, and through regenerative agriculture. But back when I was growing up, I used to follow this indie food publication, Goya Journal, incessantly. They would constantly feature people who were creating delicious food from native and local species, and tell the stories behind the food; from the minute I saw that first story about creating delicious dishes like Halasina Kalapu (steamed jackfruit wrapped in banana leaf) I was just hooked. I couldn't wait for new content which would feature a local chef creating something amazing from whatever grew in his or her garden! I knew that's what I wanted to do when I grew older. Fast forward to today, and that's me. If I can inspire even one other person to do the same thing, I would be happy.

I should mention that we were also one of the first in India to move away from primarily cash crops to adopt this regenerative agriculture model, coupled with multiple streams of income, even though it's the standard for farmers nowadays. But to tell the truth, we can't ignore the technological advances that made this possible for us to have a thriving farm. I remember when I was growing up, the Sikkim government campaign of "*scaling diversity, using technology*". We got robotic autonomous farm vehicles around 2030, that could adapt to the stepped farming of the hills. This made farming more effective with less labour. Of course precision agriculture got better, and enabled us to grow more effectively along with those apps to help us figure out what to plant when. And I really can't forget about the breakthrough that happened in the Indian Institute of Technology, Gangtok, which used acoustics to ensure animals did not interfere with our crops. That was a game changer for our region.

It helps that the Sikkim Darjeeling Himalaya region became India's first designated "Food Tourism Destination". Now there are over 1000 all over the world, but we were the first! Now I travel all over the world and help women start food tourism business on their land. I love helping people all over the world experiment with their local foods and come up with new tasty dishes- mixing ancient with the new. Turns out all places around the world have something unique, if you look hard enough. And I love that women are now the centre of this food system, as it should be.

Although I'm a Lepcha chef, I remember when I was very young, we would only eat our traditional food (*kasalok, moongarbuk* -- varieties of sweet potato and yam) on special occasions. But sometime when I was a teenager things started changing and our local food was all the rage. We would beg our parents to eat *bhat-dal-sabji-tarkari-mohi-achar*. My daughter still doesn't believe me. She wouldn't dream of eating pizza over our food. Sure we eat all kinds of food occasionally, but we are proud of our food and the cook-offs during the annual festival are world famous! I still can't believe we started this trend all over the world. But honestly, I can't call it a trend. It's science. We now have proof that eating seasonal, local food helps the gut microbiomes -- something that was only beginning to be understood in 2020. I know that our generation has turned healthier and my daughter's generation even more so because of what we eat.

While I do experience "mother-guilt" every now and then, when I travel I also want to be a strong female role model for my daughter. I love that she is growing up in a pristine natural environment, similar to when I grew up. I know that she has access to some of the best primary and secondary educational systems in the world- much better than what I had growing up. She can be anything she wants to be without ever having to leave the Sikkim-Darjeeling Himalaya region if she doesn't want to. We truly live in paradise.

Vikram Singh Tamang (Founder of Tashi, a shared service company, connector for Dorjee & Roshni - 25 years old)

I think they used to call people like us "middle-men"? Back in the olden days? It just makes me wonder how they lived with such a basic (I think you oldies call it "backwards"?) system back then. I love what I do today. I bring communities together, and ensure people stay healthy, and the local economy thrives. I own the shared services company, Tashi Delek (or Tashi for short). It was really the blockchain technology and digital payments back in 2020 that really enabled us to exist. Now the entire food supply chain is transparently tracked through the blockchain, and farmers can see prices from all over through our Tashi AR dashboards, and get paid instantly. I can't believe "middle men" used to make farmers send the food all the way down to a

central market in the plains, only to bring it all the way back to the hills again! So ineffective! And how they would price gouge; it was positively criminal and so climate-unfriendly! Anyway, farmers have no problem allowing our company to take a small percentage of whatever they sell.

But we do so much more than just that. We work with the 10 Farmer Producer Organizations (FPOs) around Passingdang Village, and help them find new markets for their food, provide crop insurance by coordinating directly with the government schemes, share the latest market prices across regions, and ensure they are using the latest technologies to have the most efficient crops. We even have new robotic autonomous farm equipment that can be used on terraced farms. We enable the farmers to share the use of all this equipment, and obviously all the agriculture practiced is regenerative. We also provide the transport for all the local food to get where it needs to go, and we coordinate with bulk suppliers if it needs to get transported out of Passingdang Village. Finally, we also organize small-agro processing units so farmers can realize the full value out of their cash crops (like oil-extraction). We coordinate processing and distribution across India and abroad- and of course farmers get more money than I heard they ever used to since they get the value of the final product, not just the crop. People love our products all over the world! Back in 2020, I heard there was almost NO local market for crops, no small agro processing units, and most of the food was imported. It seems crazy now, given how fertile our land is. Today we have almost 50% that's actually used locally, and farmers get much of their income from the sale of final processed products. Now all the businesses, restaurants, and hotels mainly serve local food, and use our local products.

But that's actually my favorite part of my job; talking with the farmers and the customers we sell the produce to. And I know we're not supposed to have favorites, but my favorite customer is Roshni. I follow her on MR Snap (a social media channel). I always keep the freshest ingredients for her. She makes me so proud. If I ever have a daughter, I hope she does something like that when she gets older. But I'll have to get married for that. I want to find someone, who wants to build my business with me.

Lakshmi: 23-Year-old tourist from Chennai, India

I don't know if I ever want to leave, I can't believe a place with so much beauty exists in the world! I came here on a 3-month voluntourism project. Now I don't know if I ever want to leave. My day job is digital marketing, but I can do that anywhere in the world. I am a foodie. I moved here so that in my spare time I can learn about how food is grown. The people are lovely, the environment is pristine, and the food. Ohh! The Food!! I can't believe the types of things they eat!

I do a lot of the grunt work around the farm and I'm learning from the best. Roshni is amazing! And plus, going through the forest and foraging for wild edibles is actually quite fun. She's showing me how to innovate with the food that grows locally, in her backyard. But I want to learn the principles so I can take it back to my hometown in Tirunelveli district in South India. Tirunelveli is not one of the world's designated food tourism hot spots yet, but I'm determined to make that happen!

What fascinates me is how many different things they grow, and how they ensure that all the food that's grown is actually sold at a good price. Nothing goes waste! They figured out how to scale heterogeneity. I am trying to bring back heirloom cultivars to Tirunelveli so I'm trying to learn how they did it in the Sikkim-Darjeeling region. It has become a popular spot to come and learn! Who wouldn't want to eat farm-fresh, organic, nutritious, delicious food every day? I'm hoping I can get my community to adopt this model though. I heard it

was actually something quite small, something called the Rockefeller Food Vision Prize, that sparked this whole movement in 2020. Stories like that give me hope that a small group can make a big difference.

I'm also amazed at how they kept the place so clean! Roshni was telling me it wasn't always like this. In her grandmother's time, they were just beginning to have a solid waste management problem. But then they started focusing on creating a circular economy- grow local, less packaging, less garbage, better environment. And now they live in one of the most beautiful places on the planet. I'm so jealous!

Sonam Bhutia, Minister of Agriculture, Sikkim State- (60 years old)

"The future is here, it's just not evenly distributed". I tell everyone this nowadays. When I heard that when I was studying for my Indian Administrative Services (IAS) exams back in the day, I didn't really know what that meant, but the phrase stuck with me. Now at age 60, I can't even begin to tell you how true that is. I don't even recognize this place I call home. But back in 2020, I got a glimpse of what was to come, and it made me hopeful for a better future. It inspired me to stay, and in fact, inspired me to work harder to become a part of the Government of Sikkim. Back then, most people took a government job because it paid a steady income, but for me, I wanted to make a change. Today, people are proud to be working in government (well, at least people start out idealistic!) but back then nobody went in with that attitude. But I wanted to change that.

I was one of the first people who attended a Food Futures Academy seminar, and it changed my life. Now they have similar programs all over the world funded by Rockefeller Foundation. It made me think bigger; we could do so much more.

Take women in the workforce for example. Back in 2020, the "feminization of agriculture" was a big trend, but they still weren't there in important government positions in Sikkim. Looking at the government today, you would hardly believe women were ever under-represented! But I think, personally, it's a good thing. Sikkim has benefited greatly from this change. Just take a look at what has happened to wasting, stunting, low birth weights, and obesity in our region. Back in 2020, there were concerns about all of these issues. But today, these issues have been virtually eliminated! I can't say it's necessarily because of women, but all I will say is that many of them got behind most of the policies that changed the shape of food systems in the Sikkim-Darjeeling Himalaya region. For example, they made sure that the hilly regions in India were not neglected. They fought hard for their people to be nationally represented and had policies specially designed for the region. I mean, it's common sense now, but back then national food, agriculture and nutritional policies were NOT segregated by region. They fought hard to get part of the Public Distribution System and other government schemes (like Mid-Day meals) to prioritize sourcing and serving local and native foods. I personally think that was the largest contributor to the elimination of stunting, wasting, and low birth-weights in our region.

They also fought to include agricultural work as part of the Mahatma Gandhi National Rural Employment Guarantee Act 2005. The scheme, started in 2005, had good intentions, but for our region, it diverted much needed agricultural labour to rural infrastructure development and construction activities. By adding agricultural labour into the equation, we revitalized the farming ecosystem. I have a son, and I'm proud to say that I am raising him as a feminist, in one of the most beautiful lands in all the world.

The Sikkim Darjeeling Himalaya Region's Food System- 2050

I notice everything. The Lepchas call me Itbu-Moo. Hindus call me Bhumi. Others call me mother earth. I'm one and the same. I observe everything, and I feel deeply for all living things. I don't like it when my children fight and kill each other. Especially when humans and animals engage in conflict over land. It still exists, but I can say it has significantly improved. We have technology to thank for that. Because of Indian Institute of Technology, Gangtok, which used acoustics to ensure animals did not interfere with crops, more farmers were able to safely fend off animals and were able to farm in peace. That was one of the major factors the people of the Sikkim-Darjeeling Himalaya region gave up farming in the late 2010s. But now in 2050, although it's still a problem, it's significantly better- at least not a deterrent to farming, and animals remain largely unharmed. And climate change. I was honestly worried back in 2020. Although it didn't go away completely, India only warmed by 2° C. It could have been much worse.

We all know that nothing is perfect, but what inspires me is that people never stopped trying to work towards that ideal. And sometimes, it really does pay off. The spring revival efforts successfully restored the drying springs to provide water, along with a springshed management committee ensuring equity in water distribution between upstream and downstream communities.

But every once in a while someone comes along who really makes a difference. Sonam, the current Agricultural Minister of Sikkim, was instrumental in making some of these tough tradeoffs. He protected me and encouraged regenerative agriculture, even though there were some short term economic losses. He realized that in the long run, this is what his people wanted, and he had the guts to do what he believed represented what the people wanted- not just short term profits for corporations. You didn't see that very commonly in India back then. He also promoted tourism, but the responsible kind. I love how his tourism initiatives have preserved the landscape, but more importantly, the landscape is dotted with beautiful houses that are made with local material. He could have made a lot of money getting kickbacks from many politicians, but he didn't. He did what was right. India used to be called a "flawed democracy", but that couldn't be further from the truth today. It's because of people like Sonam that turned this country around, fought for what was right, and protected me.

This is why I have hope for a brighter future. The people of the Sikkim-Darjeeling Himalaya region have come so far, and made so much progress. I know they will continue to do so.

High Level Vision Summary

Our vision is that the Sikkim-Darjeeling Himalaya region will ensure sustainable livelihoods and opportunities for all, while preserving the environment and achieving food and nutritional sovereignty. This will be accomplished through a successful model of smallholder agriculture, supplemented by value-added and off-farm entrepreneurial activities that are driven by responsible tourism.

The landscape and natural beauty of the region is the pride and joy of the people of the Sikkim-Darjeeling Himalayas. In 2050, it is likely that tourism will continue to be the biggest source of revenue for the region. With appropriate interventions, native food systems will become an integral part of the local tourism ecosystem, spurring the concept of "food tourism". This "food tourism" will not only extend to the food of the land, but as the existing culture is so tied into the land, it will serve as a gateway to cultural exchange. Sacred sites will be preserved and the traditional practice of sharing heirloom variety seeds will be maintained. This

type of food tourism will act as an important lever to restore agro-biodiversity, while also restoring pride in the local food and culture of the region. Women are in the forefront with respect to mountain farming, and will continue to play a central role in capitalizing on these new income streams as well.

Technology will be a large driver in making smallholder farming viable. Although climate change will still be a problem, it will be limited to a 2° C temperature rise. Early warning systems and predictive models that adapt to climatic changes will guide farmers on what crops to plant. Shared services providers will replace middle men and will provide farmers with insurance policies, precision agriculture equipment, transportation to markets, facilitate small-scale agro processing units, price transparency and instant digital payments. These developments, along with technologies to reduce human animal conflict, will allow smallholder agriculture to thrive in the region, as farmers will realize more revenue from processed products, and multiple income sources. Investments in cold storage, seed and fodder banks in each district will help preserve local cultivars, weather drought periods and minimise post-harvest waste.

Agriculture will be practiced in a regenerative manner. It will provide a premium income from consumers, as blockchain technology and better access to shared service providers will allow consumers unprecedented supply chain transparency. This technology also allows farmers to capture a premium for other entrepreneurial activities, such as honey and milk sales. It will be the norm for families to have multiple sources of income in the region.

Policy will be enacted to not only promote local food and tourism economy, but also to encourage regenerative, bio-diverse agriculture and sustain water resources. These policies will increase investment into rural infrastructure as well as encourage agricultural land to not only be used for cash crops. It will also encourage producing food for local consumption, bolstering food and nutritional sovereignty for the region. As a result, local and native produce will account for more than 50% of food production and consumption in the region; agro-biodiversity will be restored. Reduced resource intensiveness, increased crop yields from resilient, native crops, and a combination of biophysical interventions and springshed management institutions that ensure equitable and sustainable use of the resource will enable farmers will enable the Sikkim-Darjeeling Himalayas to maximize food production in the region. Although it will still rely on the TPDS, it will ensure that it is resistant to shocks.

By 2050, TPDS will prioritise nutrition and sustainable livelihoods. This policy shift, along with increased consumer demand, will make smallholder agriculture and local food enterprises economically viable. Policy will also allow for the foraging of wild edibles, and it will become a staple in the region's diets. As these native, nutritious foods become part of the diet again, the region will achieve nutritional sovereignty, virtually eliminating childhood wasting, stunting, and low birth weights. Emerging trends of obesity and hypertension in the older populations will be successfully controlled.

Restoration of local economies, will drive investment of local primary and secondary education institutions. This will spur a virtuous cycle of keeping talent in the area. By 2050, local institutions will innovate agricultural technologies to adapt to labour constraints and climate variability. Technology innovations (shared services apps, cold storage etc.) will help effectively scale heterogeneous product lines through robust supply chain interventions.

In summary, by 2050, the Sikkim-Darjeeling Himalaya region will ensure sustainable livelihoods and opportunities for all, while preserving the environment and achieving food and nutritional sovereignty.

How we Created this Vision

This vision was co-created by ATREE's Centre for Social and Environmental Innovation (CSEI) and the ATREE Eastern Himalaya Regional Office in Gangtok, as part of the Food Futures Initiative. It is based on discussions with the people of the landscape across stakeholder groups, as well as almost two decades of ATREE's work with farmers in the region. The hopes of the people, who have a strong "sense of place", are to lead a life which is peaceful, and free to practice their religion, culture and traditions, to be healthy, and have enough income to be able to afford the comforts of life. They also hope the verdant forests remain, the numerous rivers continue to flow, and people stay connected to families and friends.

In designing this vision, the key challenge was to be able to imagine a future that builds on the best of the region's culture and tradition, while also allowing it to progress beyond the historical constraints of the terrain that shackled people to poverty. The vision must recognise that the future, under climate change, will be very different from the past. But despite this, the natural resources of the region -- soil, water, biodiversity -- must be sustained, while allowing the region to develop and people to lead fulfilling, meaningful lives.

Traditional approaches to solutioning, have often been siloed, resulting in unintended consequences. A systems approach (See diagram in Question 16) was therefore crucial in recognising possible feedbacks and virtuous and vicious cycles.

While our vision does imagine a resurgence of pride in local food culture and tradition, we are not turning the clock back. Rather we imagine a blend of the old and the new.

There are assumptions that underpin our vision

First, creating a vibrant local food tourism economy is possible if tourists demand and pay for authentic food experiences.

Second, even under climate change, small-holder regenerative agriculture can become economically viable if provided farm income is augmented with other sources of income such as homestays, food tourism, and realizing the value of finished products through small scale agro-processing units.

Third, technology can be used to "scale heterogeneity". With better supply chain provenance and shared services platforms, farmers will be able to get higher prices for their produce.

Fourth, agriculture can be sustainably expanded in the region with better management of springs, and predictive climate models.

Fifth, with the introduction of labour saving technologies, labour productivity in agriculture will improve and keep enough people engaged in agriculture.

Obviously, these assumptions will need to be validated with data and research. We hope that our research partners, LSHTM and PHFI, will help us embed any interventions we undertake within a learning framework, collecting data and building models to test these assumptions and change course as new information becomes available or unintended consequences surface.

How we will make the vision happen by 2050

There are five main levers we believe we can use in making this vision come true. Each of these levers works on accelerating or stabilising the loops in the food system.

The first lever is influencing food tourism demand. By promoting food tourism, and building capacity of entrepreneurs (through a “Food Futures Academy”), establishing local markets, and increasing local awareness and pride in the food culture, we would increase demand for locally grown native foods. This will boost agro-biodiversity and environmental sustainability and lower risks from the effects of climate variability.

The second lever is strengthening the local food economy through changes to the Targeted Public Distribution System (TPDS). One of the main challenges to creating a sustainable food future is the government policies around the TPDS, and incentivization of cash crops, calories, and yield over more nutritional and environmentally sustainable alternatives. We envision a future where the TPDS augments the import of cereals, with more nutritious, locally grown traditional food crops. This will boost nutrition and health outcomes for the population. Additionally, better education, pride in the local foods and entrepreneurship opportunities for value added products and services, will make smallholder farming economically feasible. This will further give inhabitants compelling reasons to stay rather than migrate from their homeland, creating a virtuous cycle.

The third lever is advancing agricultural technology. To address the constraint of labour unavailability and drudgery, we believe that some of the mechanisation technologies that are used in the plains can be adapted to the hilly terrain. This will reduce the need for agricultural labour and make farming more economically feasible and aspirational. Scientific advances will improve yields of local varieties of foods. Technology will also allow smallholder agriculture to become economically viable by enabling better supply chains, and higher value for the produce for farmers. Technology innovations can help address the problem of market linkages and supply chain logistics.

The fourth lever is sustaining the natural resource base. Better management of the spring systems, both in enhancing recharge as well as instituting mechanisms to allocate and distribute the resource equitably, will be key to ensuring that crops are able to weather prolonged dry spells and water is harvested during wet spells.

The fifth lever is increasing labour availability for agriculture. Even with mechanization, there is still a need for more people to stay in the region, as you still need some farm hands who are paid fairly to manage and work on farms. To do this, we will need to make farming aspirational. Labour saving devices will improve productivity, allowing higher wages. As the food economy in the Sikkim-Darjeeling Himalayan region strengthens, we believe that investments in education will follow economic growth and make living in the region more viable for families.