### **Audio Transcript: The “Do-Nothing” Farmer**

*Note: Episodes of Outside/In are made as pieces of audio, and some context and nuance may be lost on the page. Transcripts are generated using a combination of speech recognition software and human transcribers, and may contain errors.*

**////**

**PART I, The Revolution**

**Justine Paradis: This is Outside/In. I’m Justine Paradis.**

SFX: Digging and orchard ambi

**Imagine you’re in a grassy meadow, and you’re digging a hole.**

SFX: Digging and orchard ambi

**As you dig, you might start to notice that** [**the soil has layers**](https://onlinelibrary.wiley.com/doi/full/10.1111/j.1936-704X.2015.03186.x) **-- almost like a cake. The top layer – a foot deep, maybe more -- is rich and dark, almost black. Below that, we start hitting a clay layer – lighter, maybe almost the color of rust.**

MUX: St Augustine, Blue Dot Sessions

**There’s a lot going on, especially in those top layers. Worms dragging leaves down into the soil -- spiders, hunting -- tendrils of fungus, negotiating with roots... sit and watch. It is NOT just dirt, but a matrix of activity. Porous, sticky, alive.**

**Now, imagine driving a huge metal blade through it, flipping it upside down, and smashing it up.**

SFX: Tractor

**/////**

**In general, farming (as we know it) dramatically changes the land. And it’s not just the obvious stuff -- like the use of cancer-causing pesticides, or** [**antibiotics sprayed onto orange trees.**](https://www.nature.com/articles/d41586-019-00878-4)

**We’re also talking about a basic practice that happens both on huge, industrialized operations -- and on little local organic farms, too.**

**Tilling. It’s one of the first steps in a typical growing season. Turning the soil. This is often done before planting, as a technique to manage weeds and incorporate compost into the soil.**

**But tilling, or the more intensive version - plowing -- has lots of side effects. It breaks up soil structure — that dirt layer cake. It triggers the release of huge amounts of carbon. And after, the earth is bare of growth. Which means: it’s exposed, vulnerable to the two of the biggest forces of erosion on the planet. Wind and water.[[1]](#footnote-1)**

**These were exactly the kind of conditions which famously led to the Dust Bowl in the 1930s. Settlers plowed the native grassland for their homesteads.**

**They called this “**[**breaking the prairie.”**](https://landinstitute.org/scientific-pub/living-nets-new-prairie-sea/)

**Without those roots to hold the dry dirt, strong prevailing winds kicked it up into clouds of dust, darkening the sky all the way in Washington D.C.**

**The Dust Bowl is a dramatic example but not a singular one. Globally, we are still losing fertile soil from farmland -- at alarming rates -- way faster than the rate that soil is being created.[[2]](#footnote-2) [[3]](#footnote-3)**

**//**

**I was maybe 19, 20 years old when I was learning a lot of this. And since a lot of organic farms till the soil too — well, I was starting to wonder if there is any such thing as a farm that isn’t ultimately bad for the land. This all felt like a necessary question.**

**And it was around that time that I came across something… that would completely change the way I approached farming.**

**Decades before there was such a thing as international permaculture conferences, or certified organic tomatoes for sale in the grocery store… there was a farmer on an island in southern Japan, who turned his back on modern agriculture… and devoted his life to finding another way.**

**A natural way of farming… is there really such a thing?**

MUSIC: Everglow, Patrick Patrikios

**Today, if you pay a visit to a certain kind of farm or garden -- one that’s a little untidy and weedy… maybe it looks more like a forest or a meadow than a place to grow food. Check out the bookshelf. And don’t be surprised if you see a dog-eared copy of this man’s manifesto -- *The One-Straw Revolution*.**

**This is a book that’s been described by writer Michael Pollan as “one of the founding documents of the alternative food movement.”**

**But its reach goes far beyond farming. *The One Straw Revolution* has been translated into 25 languages and admired by artists, writers, and philosophers.**

Robin Calderon: I couldn't quite figure out how he pulled it off, but he did.

Takeshi Watanabe: He was resisting what people most people in Japan followed or wanted.

**I’m Justine Paradis. Today on *Outside/In,* we ask: what is it about this slim green book that has touched so many people?**

**The journey brings us to that corner of Japan…**

Hiroki Fukuoka: 。。。この辺りはいうような話になりますね [laughter]

**… and the mountain where Masanobu Fukuoka lived and farmed -- to explore the possibility of a natural way of farming.**

MUSIC FADE

Hannah Kirshner: It’s raining really really hard right now and I’m hoping you’re not hearing that on the recording.

**Justine Paradis: So, first up, let me introduce my collaborator for this story: writer Hannah Kirshner—joining me from Japan.**

Hannah Kirshner: Let’s see if it eases up in a minute or two.

**She lives in a mountain town near the Japan Sea, where she works part time in a sake brewery, and she wrote a book about craft and cultivation there.**

Hannah Kirshner: K! Here we go.

**Justine Paradis: So, to answer our question about why this famous little book you’ve maybe never heard of impacted so many people -- we should begin with its author, Masanobu Fukuoka, and his origin story.**

**Hannah Kirshner: Here’s how he told it. It was the 1930’s. Fukuoka was working as a plant pathologist in Yokohama, a big port city right next to Tokyo. He worked at the Customs Bureau. His job was to inspect plants under the microscope for fungus and disease.**

**Justine Paradis: Fukuoka had grown up 500 miles away, on his family farm on the island of Shikoku. His family were land owners, and well-respected. His father was actually their town’s mayor.**

**Hannah Kirshner: So, at only 25 years old, Fukuoka had moved from the farm to the city, and he was working with renowned researchers.**

MUSIC: Tricky Pothos, Blue Dot Sessions

**Justine Paradis: But then, he got sick – acute pneumonia. He was in the hospital for a while, and after he recovered, something had changed in him. He felt unfocused at work, and started taking these long, listless walks at night... wondering, what is the point of all this?**

**Hannah Kirshner: And on one of these walks, in the very early morning, he collapsed in exhaustion on a hill, overlooking the harbor. He watched the sunrise. Then – out of the silence, a night heron appeared, cried out, and flew off.**

SFX: Harbor ambi, Japanese night heron call

**Justine Paradis: Of this moment, Fukuoka wrote: “Everything I had held in firm conviction, everything upon which I had ordinarily relied was swept away with the wind. I felt that I understood just one thing… I felt that I understood nothing.”[[4]](#footnote-4)**

MUSIC END

**Justine Paradis: The next day, he went to work and handed in his resignation.**

**Hannah Kirshner: This was the moment that Fukuoka turned away from city life, a steady salary and a career in science. He turned back to farming, eventually writing the manifesto he’s known for. *The One-Straw Revolution.***

**Justine Paradis: Whenever I mention *The One Straw Revolution,* I’d say people have either NEVER heard of it… or they LOVE it. It’s a farming manual unlike any I’ve read. Instead of explaining how to increase yields or design a landscape or really very much specific instructions of any kind… *The One Straw Revolution* advises readers to essentially relinquish any sense of control. And instead, observe nature, and ask the land what *it* needs.**

**It’s a method he calls “shizen noho” *—* the natural way of farming. But he also called it, echoing this revelation, “do-nothing farming.”**

Takeshi Watanabe:It's a very literary work, and I think he's crafting a certain persona.

**Hannah Kirshner: This is professor Takeshi Watanabe. He teaches East Asian studies at Wesleyan University.**

**Justine Paradis: Fukuoka does present SOME practical advice in the book… but much of his writing echoes a style of delivering philosophical lessons through anecdotes or riddles.**

Takeshi Watanabe: Even the idea of “do nothing” is very much a literal borrowing from Taoist teachings.

**Justine Paradis: And as for that awakening by the harbor –**

Takeshi Watanabe: His story there at the beginning has echoes of Buddha's life or a kind of an awakening that a Sage has.

**Hannah Kirshner: It’s hard to know how much of the story is TRUE in a very literal sense. But that’s not exactly the point.**

MUSIC: Rumoi Line, Blue Dot Sessions

 **Justine Paradis: This moment in Japan, and the world in general, it was an electrifying time. It was the decade of the first television broadcast, of Amelia Earhart’s flight across the Atlantic.**

**Hannah Kirshner: But Masanobu Fukuoka turned his back on all that, and went home to his family farm.**

MUSIC SHIFT

**Justine Paradis: According to his revelation: he knew nothing… and he would approach farming in the same way. When got back to the farm, he convinced his father to let him put his ideas into practice in their rice fields and citrus orchard.**

MUSIC FADE

**And one of the most dramatic things he did was: he stopped pruning the citrus trees.**

**Hannah Kirshner: Pruning is a very old technique -- it’s even** [**mentioned in the Bible**](https://www.uu.edu/societies/inklings/books/FruitofChristsPresence/Fruit_Chapter2.pdf)**. It’s essentially trimming a plant to make it grow a certain way: shaping a topiary or bonsai… or, in farming, to make it produce more fruit or leaves.**

**Justine Paradis: But, Masanobu-san looked at this and saw unnecessary human interference. He said, quote, “my conviction was that crops grow themselves and should not have to be grown.”[[5]](#footnote-5)**

**Hannah Kirshner: So, he abruptly stopped pruning the trees. And the results... [PAUSE] were disastrous. The branches of the trees grew tangled, insects attacked, and he lost more than four hundred trees.[[6]](#footnote-6)**

**Justine Paradis: His father was shocked. He told his son to discipline himself and go get a job.**

MUSIC: Her Caliber, Blue Dot Sessions

[Radio static, waves, and eerie sound design]

**Hannah Kirshner: But in the same moment …**

*Franklin D. Roosevelt: Yesterday, December 7, 1941, a date which will live in infamy.*

**Justine Paradis: … war changed their lives.**

[WAR SFX: waves, radio static]

*There is reason to believe that the Japanese city of Hiroshima, approximately the size of Memphis or Seattle or Rochester, NY, no longer exists.*

[WAR SFX fade]

**Justine Paradis: During the war, Fukuoka went back to work as an agricultural scientist, working to boost wartime food production... although, in the final months of the war, he was drafted to dig foxholes at the front, in preparation of a possible Allied land invasion of Japan. An invasion which came.[[7]](#footnote-7)**

*Radio broadcast: There is reason to believe that the Japanese city of Hiroshima, approximately the size of Memphis or Seattle or Rochester, NY, no longer exists.*

**Hannah Kirshner: But by the time he returned to farming after the war, Japan had been absolutely devastated. And not just by the nuclear bombs, but firebombings all over the country.**

MUSIC SWELL AND OUT: Kvelden Trapp stems, Blue Dot Sessions

**The Allied Forces, who had inflicted that devastation, were then involved in rebuilding and restructuring the country — from the constitution to the way people farmed.**

MUSIC IN: Rumoi Line stems

**Justine Paradis: After 1945,** [**mechanization**](http://ras.org.in/farm_mechanisation_and_its_impact_on_women%E2%80%99s_labour) **and** [**pesticide use in Japan**](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4309314/%26sa%3DD%26source%3Ddocs%26ust%3D1639177703960000%26usg%3DAOvVaw2TsxhXIz_BdnHeA_-spJYJ) **- increased dramatically..**

**Hannah Kirshner:** [**During the war**](https://aboutjapan.japansociety.org/food_rations)**, people in Japan had endured food shortages andreal hunger. So, all these new chemicals and machines - they seemed like a miracle! People didn’t have to hunch down and weed the rice fields anymore. They didn’t have to pick caterpillars off the cabbages one by one. .**

**Here again is Takeshi Watanabe.**

Takeshi Watanabe: There’s this sense of pursuing technology and pursuing growth at all costs. And it was in some ways also a reaction against World War Two... and this idea that Japan needed to be- needed to advance technologically… to become a first rate country again**.**

**Justine Paradis: But, even after the war, Fukuoka was still looking in the opposite direction.**

Takeshi Watanabe: He… is very much a maverick. And somebody who was espousing a counterculture.

**​​Hannah Kirshner: And remember, Fukuoka had come from this technical research background. But now, he viewed science as myopic. That it breaks down the world into smaller and smaller parts, so you lose sight of the whole.**

Takeshi Watanabe: He doesn't believe in things or he doesn't do things just because people tell him to. In fact, he... he rejects chemical fertilizers or pesticides because he's seeing the damage that they're doing to the ecology, to his farm. So he's actually being very rigorous, right?

**Justine Paradis: So, Fukuoka continued his work towards a way of farming that worked WITH nature… without technology or herbicides… experimenting and testing his ideas… for the next thirty years.**

MUSIC OUT

**Justine Paradis: Fukuoka’s method of “do-nothing” is really about “do nothing unnecessary.” And he distilled the practice into four principles.**

DRUMBEATS

**1) No cultivation -- aka no tilling;**

**2) no fertilizer or prepared compost;**

**3) no weeding, either by tillage or herbicides;**

**and 4) no dependence on chemicals to solve problems. Weeds and insects are not enemies, and disease is just a symptom of something amiss in the system.**

**Hannah Kirshner: Rice is a good example of what these ideas look like in practice. When you picture a rice paddy, you might imagine a flooded field, with rows of rice plants growing out of the water like reeds in a pond. That IS what most Japanese farms look like.**

**But, actually, rice doesn’t *need* to grow in water. It’s just that it can, and lots of weeds can’t, or at least not very well.**

MUSIC IN: Friction Model, Blue Dot Sessions

**Justine Paradis: So, Fukuoka developed a particular technique of growing rice, blending very old practices with methods derived from his own observations.**

**Hannah Kirshner: Instead of transplanting seedlings in late spring, he scattered clay covered rice seeds directly into the field while it was still cold.**

**He used a cover crop of clover and a winter crop of barley or rye to control weeds.**

**He *never* tilled the fields — instead letting roots and insects aerate the soil**

**And he only flooded the fields for two weeks.**

**Justine Paradis: Another practice Fukuoka’s known for – seed balls. He sowed vegetables in his orchard by mixing them with clay and forming balls, and then tossing them between the trees. These days, guerrilla gardeners call these “seed bombs.”**

MUSIC FADE

**Hannah Kirshner: And here’s the thing - Fukuoka said that with these techniques, his farm produced *just as much food* as what he called “scientific agriculture” -- *without* all the problems that come with it.**

**Justine Paradis: So, the term “do-nothing” is easy to misinterpret. Fukuoka doesn’t mean being lazy or inactive. His way of farming involves precise timing and a LOT of hard work. He felt our lives would be more satisfying, and we’d have fewer problems, if we could be more in tune with nature.**

 **And that message - was about to *really* resonate with people all around the world.**

**That’s coming up – after a break.**

**// BREAK //**

TIME JUMP:

*[SFX: radio tuning]*

[*Astroboy theme*](https://youtu.be/UpNb2kDhHSo)

**Hannah Kirshner: Okay. 1960s, 1970s. Japan. Astroboy was on TV. Cup Noodle was invented.**

**Justine Paradis: Cup Noodle! [laughs]**

**Hannah Kirshner: [laughs] But all this rapid industrialization -- was starting to have consequences.**

MUSIC: Lick Stick, Blue Dot Sessions

Takeshi Watanabe: Smog, industrial pollution, there are a few really big cases that emerged in Japan at that time.

**Justine Paradis: In one city, Minimata, people started exhibiting scary symptoms: mood swings, loss of vision and hearing, in some cases death. People eventually realized a chemical company dumping wastewater into a bay where people harvested shellfish. What people were experiencing was mercury poisoning.**

Takeshi Watanabe: But this is really the time in the sixties when people realize that economic growth at all costs may not be the answer.

MUSIC FADE

**Hannah Kirshner: Arguably, environmental activism was, and still is not so mainstream in Japan.[[8]](#footnote-8)[[9]](#footnote-9) But some people *had* started to hear about Fukuoka and his method. He published articles, and appeared on TV. Scientists came to his farm to try to figure out why his methods worked so well.**

**Justine Paradis: And… Fukuoka mentored young seekers, who’d made the pilgrimage to his farm. They came from within Japan, and from outside the country too.**

**Hannah Kirshner: Fukuoka would have them stay up on the mountain, in little huts in the citrus orchard. They lived as he had while he was developing his system of farming, without electricity or running water. And ate a simple diet of miso soup, brown rice, and pickled vegetables.**

**As Takeshi points out, Fukuoka had a kind of persona… *especially* to people from the West.**

Takeshi Watanabe: But there's very much this kind of wise old Asian sage, I think image that he projects, right? He has that white kind of beard, wispy beard, and he spews these kind of like nonsensical, like, contradictory kinds of words of wisdom. And he has that kind of vibe to him, which – I don't, you know, I think it was just him, but it obviously, I think, tapped into stereotypes or certain fantasies that many people were looking for in Asia.

**Justine Paradis: This was a time when Asian philosophy was starting to look really appealing for folks in the Western counterculture. In the ‘50s,** [**the Beat poets**](https://www.oxfordbibliographies.com/view/document/obo-9780195393521/obo-9780195393521-0109.xml)**; in the ‘60’s,** [**the *Beatles* -- studied transcendental meditation in India**](https://www.themarginalian.org/2015/10/09/john-lennon-letters-meditation/)**.**

MUSIC: The Beatles, “Within You Without You”

**Justine Paradis: And then, came the hippies.**

Takeshi Watanabe: And it's very much, I think, in line with the beat generation and with this kind of kind of rebellion against the West and Western modernism.

**Justine Paradis: And, in the 70’s, one young hippie was living on Fukuoka’s mountain. An American named Larry Korn.**

MUSIC: JR Nara stems, Blue Dot Sessions

**Larry was in his twenties. He had studied soil science at UC Berkeley, and spent years traveling around Japan, often on farms.**

**Hannah Kirshner: Fukuoka published *The One Straw Revolution* in Japanese while Larry was living on the mountain.[[10]](#footnote-10) And when Larry read the manuscript… it *really* appealed to him.**

**Justine Paradis: Even the title -- *The One-Straw Revolution --* it is so well-timed to resonate with the counterculture. This idea that something as simple as a piece of straw can bring about great change. The book actually begins like this:**

*“Seen at a glance, this rice straw may appear light and insignificant. Hardly anyone would believe that it could start a revolution. But I have come to realize the weight and power of this straw. For me, this revolution is very real.”[[11]](#footnote-11)*

**Hannah Kirshner: Larry excitedly helped get the book translated into English. Then, he headed back to Berkeley, California, and started showing it to some of the most famous environmental thinkers of the day.**

**Justine Paradis: An editor at the University of California Press, Pulitzer-prize-winning poet Gary Snyder.... And eventually, writer and farmer Wendell Berry, who ended up editing the book, and publishing it with the Rodale Institute. Now, these may not be household names for everybody, but trust me -- they are titans in the world of sustainable agriculture, in the second half of the twentieth century.**

Robin Calderon: And at the time, we did not want to eat anything that was grown with pesticides. We just didn't.

**Hannah Kirshner: This is my friend Robin Calderon. She was really involved with organic agriculture in Washington State, and she had her own farm — where I worked sometimes when I was in middle school.**

**Hannah Kirshner: In the ‘80s, Robin sold packaged herbs to grocery stores, like rosemary, mint, basil… and she grew them without pesticides or herbicides.**

Robin Calderon: But there wasn't an organic certification program. There was nothing like that.

**Hannah Kirshner: People could call their farm organic, but no one was checking if that’s what they were really doing, and the term could mean different things to different people. So, she** **was part of starting the official organic certification program in Washington State.**

**Justine Paradis: And one of her influences… was *The One Straw Revolution*.**

Robin Calderon: And so at the time. I was studying Zen Meditation, and so, Fukuoka's book just, you know, absolutely moved me right in my heart because he talked about do-nothing farming, which I couldn't quite figure out how he pulled it off, but he did.

**To this day, a yellowed copy of *The One Straw Revolution* still sits on her shelf.**

Robin Calderon: Because it was so special. Because for me, he was a spiritual being. I mean, I don't know. I'm not saying spiritual in the religious sense. I'm saying spiritual in the connected sense. And so, yeah, I just it's. Yeah, he made the cut! [laughs]

Hannah Kirshner: Is, is farming spiritual for you?

Robin Calderon: Yes. when I go out and work in my little vegetable garden. It gives back to me. Somehow. It rejuvenates my body. It calms my mind. Watching little seeds sprout**…**

You know, it's it's a miracle.

MUSIC: Rumoi Night stem, Blue Dot Sessions

**Hannah Kirshner: Shizen noho is NOT widely practiced in Japan. Fukuoka is much more famous outside the country. The book was translated into 25 languages, and still inspires readers all over the world, and not just farmers. Do-nothing farming, for instance, was referenced by artist Jenny Odell in her 2019 NYT best-selling book.**

**Justine Paradis: But Fukuoka did *NOT* like to be lumped with the other growing forms of alternative agriculture - natural farming was *different*. He was vocally critical of organic farming in particular. He once called organic farming “narrow natural farming.”[[12]](#footnote-12) And in later writings, put it this way:**

*“Even organic farming, which everyone is making such a big fuss over lately, is just another type of scientific farming… In fact, when examined from a broader perspective, many such efforts to protect the natural ecology are actually destructive…”[[13]](#footnote-13)*

SFX: Tractor

“*Being part and parcel of scientific agriculture to begin with, it will be swallowed whole and assimilated by scientific agriculture.”[[14]](#footnote-14)*

**Hannah Kirshner:** [**Plenty**](https://michaelpollan.com/profiles/taking-a-bite-out-of-organics/)[**of**](https://www.deliciousliving.com/health/nutrition/big-organic-bad/)[**people**](https://investinginregenerativeagriculture.com/2021/04/20/sarah-mock/)[**would**](https://www.washingtonpost.com/lifestyle/food/organic-standards-fight-over-synthetics-shows-theres-room-for-a-third-system/2014/06/12/a509a086-eff0-11e3-bf76-447a5df6411f_story.html)[**argue**](https://news.harvard.edu/gazette/story/2021/02/author-robert-paarlberg-argues-against-buying-organic/) **that’s exactly what happened.**

**Justine Paradis: Including Robin Calderon, who helped make organic an official definition – she said that over the years, that definition has been watered down. Meanwhile, Fukuoka’s shizen noho – it’s more of a way to live than a set of rules like organic farming, or an approach to landscape design like permaculture.**

**Hannah Kirshner: It actually might have the most in common with indigenous practices around the world.**

**Justine Paradis: At the time, a newspaper published by the Mohawk Nation called *Akwesasne Notes*** [**published a review of *One Straw Revolution***](http://www.aidhp.com/items/show/52#?c=&m=&s=&cv=)**. Here’s an excerpt:**

 *“Although the process he advocates arises in southern Japan… the philosophy and practice of the technique is amazingly close to that of Native peoples prior to the introduction of European agriculture… for the most part, his message could have been spoken by a Lakota, a Seneca, or a Zuni traditionalist.”*

MUSIC: Rumoi Night, stems, Blue Dot Sessions.

Takeshi Watanabe: It's not just farming, right? (...) It’s the way of farming.

**Hannah Kirshner: This is Takeshi again.**

That also is, I think, encapsulated by this idea of do-nothing farming or it's. And I think farming, definitely for him is is more than farming. It's more than a career. It's how one relates to the land, to Earth, to the cosmos.

MUSIC FADE

**Justine Paradis: In a way, I think Fukuoka has become an almost mythic figure, and his farm, a mythical place. But while the power of natural farming might be the philosophy, it also is an actual method actually… possible. Fukuoka died in 2008… but is farm *still exists.***

MUSIC: Everglow, Patrick Patrikios

**I don’t know why this was a surprise to me — maybe because it’s just existed in my mind, to some degree, but of course, it’s a real place, and it’s still the Fukuoka Family Farm. Masanobu Fukuoka’s grandson… is still living and farming on that mountain today. Like, you can go there.**

AMBI: Train in Ehime

**Justine Paradis: That’s next, on Outside/In.**

**CREDITS:**

**That was the first of our two part series on Masanobu Fukuoka and his method of “do nothing farming.” The next part is available now, in your feeds and on our website, outsideinradio.org. That’s also where you’ll find links to more reading, pictures, and a way to sign up for the podcast newsletter.**

**This episode was produced in collaboration with Hannah Kirshner. Her book is called *Water, Wood, and Wild Things: Learning Craft and Cultivation in a Japanese Mountain Town.***

**It was written and reported by Hannah Kirshner and me, Justine Paradis. I also mixed and produced the episode. We were edited by Taylor Quimby, with additional editing from Felix Poon and Outside/In’s executive producer, Rebecca Lavoie.**

**Translation help from Michael Thornton.**

**Special thanks to Tim Crews and the Land Institute, ethnobotanist Justin Robinson, Jeffrey Gray of Fenlake Farm, Paul Quirk of Ishiharaya Farm, Bill Vitek, and Atsushi Tada and Taro Nakamura, who work with the Masanobu Fukuoka Natural Farm.**

**Music in this episode from Patrick Patrikios and Blue Dot Sessions. Our Theme Music is by Breakmaster Cylinder.**

**Outside/In is a member-supported podcast. To support our work, we rely on listeners like you, making the leap to support the show by donating , if you’re able – you can do that at outsideinradio.org.**

**And thank you so much.**

**Outside/In is a production of New Hampshire PUblic Radio.**

# PART II, The Mountain

MUSIC: Capering, Blue Dot Sessions

**Justine Paradis: This is Outside/In. I’m Justine Paradis. This is the second episode of our two-part story on *The One-Straw Revolution*, Masanobu Fukuoka’s manifesto on shizen noho, or “the natural way of farming.”**

**When I first read this book, I was in my late teens, early twenties. I loved it. And I took it super seriously. And I felt like I had found at least part of an answer to this question of: is there a way of farming, of relating to land, that’s not destructive?**

**But, when I tried my hand at it – it was not as simple as I’d thought. First of all – Fukuoka had started from a *farm*, one that already existed. But my starting place was a lawn. If you’ve ever tried to plant something where there’s lawn grass… well, you basically can’t.**

**So I broke one of the main principles of shizen noho: I tilled.**

MUSIC FADE

**But after that, I tried to do it like Fukuoka did. I wasn’t growing rice, but I did make seedballs. In the fall, I planted a cover crop – winter rye, a tall grass with pale blue seed heads. In the spring, I tamped down the rye like straw. And I let my herbs go to seed, hoping they’d re-sow themselves for the next season.**

**And while I had some successes — a lot of plants didn't come back. And some of the things that did – were plants that are really good at taking over. So, I had a lot of mint and sunchokes, a tuber which by the way is really hard for a lot of people, including me,** [**to even digest…**](https://www.bonappetit.com/columns/the-foodist/article/do-jerusalem-artichokes-cause-diarrhea)

**And so… this is a funny sentence to say out loud… do-nothing farming — is REALLY HARD.**

**So… what is it about the slim farming book, that has touched so many people? I know I came to my own garden with a lot of reverence for Masanobu Fukuoka, and even after my failures, I still feel that.**

**But I do wonder how he actually pulled it off himself. And… what about now? Is shizen noho still happening in that mountain orchard?**

**These questions are actually answerable. Because his farm is a real place. It’s on the island of Shikoku, in southern Japan. And, so — writer Hannah Kirshner looked it up. The farm has a website now — and an email address.**

**So, she just asked them — could she come see it?**

**Here’s Hannah.**

**////**

AMBI: Train in Ehime

**Hannah Kirshner: The Fukuoka family farm is about an hour by train from the nearest city, . . And the local train to get there is just one car long, with velvety green and yellow seats.**

MUSIC: Palms Down

 **It takes me way out into the countryside. And the station where I get off is more like a bus stop, just a bench under a little shelter, next to a big busy road.**

AMBI: Arriving at the train station, busy road

**It’s late October – and I can smell smoke from farmers burning their rice fields after the harvest. But it’s still pretty warm – we’re at about the same latitude as San Diego.**

Hannah Kirshner: Oh, there’s a mikan tree! That’s the citrus that this area’s famous for.

**I’ve got a ten-minute walk to meet Hiroki-san, Masanobu Fukuoka’s grandson. Oh, and by the way – I’ll be using -san now, because that’s just more polite in Japan. Sort of like Mr. or Ms.**

[introductions and gift exchange]

Hannah Kirshner: Konichiwa!

Hiroki Fukuoka: Konichiwa! Hiroki-san. Hai!

Hannah Kirshner: Nice to meet you.

**Hiroki-san greets me outside his warehouse — basically a garage where they’re packing limes. He’s 48, and has been in charge of the farm since he was 30. He’s wearing pretty typical farmer clothes: grey fleece turtleneck, tan cargo pants, work boots.**

**He introduces his wife Akiko-san.**

Hiroki Fukuoka: Akiko-san.

Akiko Fukuoka: Hannah-san.

**My Japanese is OK, but I’m definitely not fluent, so two men he works with are here to help us with translation.**

MUSIC: Friction Model, Blue Dot Sessions

**Hiroki-san’s biggest crops are rice and barley, which grows in the valley; and citrus, most of which grows on the mountain. [[15]](#footnote-15)**

Hannah Kirshner: So, first we’re going to see the rice?

Hiroki Fukuoka: Rice, yes.

[AMBI]

**Most of Japan is really mountainous so there just isn’t much space for huge continuous fields like you see in the US.**

**Plus, rice planting and harvesting are a lot easier if you do the work communally. And you need infrastructure for water, so it just makes sense for everybody to cluster their fields together. And that’s how it’s been since as early as the third century BCE. So, Hiroki-san doesn’t have, like, these huge fields of golden rice. He has lots of tiny little plots scattered around the area, wedged up against their neighbors.**

**Reading the book, it’s easy to imagine Masanobu-san’s farm as rustic, maybe surrounded by forest or a patchwork of other farms. I did NOT imagine…**

Hannah Kirshner: Is this a train, or a highway?

Hiroki Fukuoka: Highway.

**… that one of Hiroki-san’s rice fields would be almost literally underneath a highway overpass.**

Hannah Kirshner: This is your rice?

Hiroki Fukuoka: Yes

AMBI: getting out of the car

**We park next to a little triangular rice field – wedged between the highway and a train track, surrounded by houses.**

AMBI: Rice field

**And, looking at the rice paddy, it’s sort of…. ordinary.**

**The ground is bare cracked mud with tidy rows of rice plants – well, the stubs that are left after harvest. And it looks just like any other rice paddy in Japan after it’s been drained.**

**So, is shizen noho happening here anymore?**

[AMBI]

MUSIC: Oriel, Blue Dot Sessions

Hannah Kirshner: hinohikari...

Translator: Famous rice!

Hannah Kirshner: Oh, is Hinohikari grown mostly in Ehime...?

**Hiroki-san is doing a couple things differently from Masanobu-san. He doesn’t direct-seed the rice, but transplants rice seedlings in late spring, like most farmers do. And he keeps his fields flooded now. He says that’s because he has to cooperate with neighbors who share the waterways.**

**But I do see something special. The harvested rice is hanging to dry in the field on wooden racks called hasa.**

**Rice drying on the hasa is just such a classic early fall scene in Japan, like something from a folk tale.**

**But now instead of cutting bunches of rice by hand and drying them in the sun, a lot of farmers use combines— tractors that can harvest and thresh the rice at the same time. And they dry the grains using machines in a warehouse.**

**Hiroki-san dries allhis rice on hasa. And not only is it a beautiful sight – sun-dried rice tastesreallygood!**

**The rice bundles hang upside down, making a thick golden curtain. Hiroki-san grows two varieties in this field. And one is a kind that his grandfather bred…**

Hiroki Fukuoka: ハッピーヒル、正信が作った--

*this is Happy Hill, Masanobu made it…*

**… called Happy Hill.**

Hannah Kirshner: How’s it different? What’s special about it?

Hiroki Fukuoka: 数が、粒の数が多いです。ええっと、

*There are lots of grains…*

Translator: It has many seeds.

**Hiroki-san takes one of the panicles in his hand—the panicle is the threads of grains at the end of the rice stalk.**

**Hannah Kirshner: He says what’s special is that it has so many seeds—so many grains...**

Hannah Kirshner: Wow, it really does have a lot of seeds.

**Hannah Kirshner: And honestly, I’ve never seen anything like it.**

MUSIC IN: Friction Model stems

Hannah Kirshner: Will you plant something else here in the winter?

Hiroki: Fukuoka: Winter, this area, mugi. は、小麦、麦は、なんですかね、

**NATURAL FARMING IS HARD**

**Hannah Kirshner: Hiroki-san has already scattered barley seeds in the field, just like Masanobu-san did. But the reason I don’t see them sprouting is the weather. It’s been so dry this fall that they haven’t germinated yet.**

**I ask Hiroki-san if that’s been tough, and he’s just like, *sometimes it doesn’t rain, sometimes it rains a lot.* He’s right, of course, that we can’t control the weather, but I’ve never seen a farmer so serene about it.**

MUSIC: Friction Model, Blue Dot Sessions

**In Masanobu-san’s writing, natural farming sounds sort of… pure.**

**But weather is not the only element outside of a farmer’s control.**

**One of the foundational principles of shizen nohois: no herbicides, pesticides or fertilizers. But you can see why it can be very difficult to grow purely organic produce in Japan. I mean, the products neighbors use on their fields inevitably leach into yours.**

**When we visit another of Hiroki-san’s rice fields, he explains: the neighbors are not practicing natural farming. They do use herbicides.**

**Obviously, not everybody feels they can afford to give up modern interventions, to relinquish a sense of control.**

**But… Hiroki-san doesn’t seem too stressed out about it. That’s just how it is.**

**The rice in this field has already been taken down off the hasa and threshed. Hiroki-san has returned the rice stalks to the field*.* The straw nourishes the soil, slows the growth of weeds, and protects seeds from being eaten by birds. Most farmers would chop up the straw, but Masanobu-san insisted on leaving the straw whole – like fallen grasses in a wild meadow.**

**And here, Hiroki-san’s field is *exactly* what I pictured while reading *The One-Straw Revolution*: he’s returned the straw to the field, and as soon as it rains, the barley seeds will sprout from under the scattered stalks.**

MUX: Kern, Blue Dot Sessions

Hiroki Fukuoka: Mountain! Go to mountain.

Hannah Kirshner: Now we're going to go to the mountain?

Hiroki Fukuoka: いいですか？

Hannah Kirshner: Great! 楽しみです *I’m excited*

**Justine Paradis: It’s time to see the mountain – that’s after a quick break.**

**BREAK**

**Justine Paradis: Welcome back to Outside/In. I’m Justine Paradis, and on this episode, writer Hannah Kirshner visits Hiroki Fukuoka, Masanobu Fukuoka’s grandson, on their Family Farm – to see if and how shizen noho lives on today. And now, she’s headed to see the mountain.**

MUX: Kern, Blue Dot Sessions

Hiroki Fukuoka: Mountain! Go to mountain.

Hannah Kirshner: Now we're going to go to the mountain?

Hiroki Fukuoka: いいですか？

Hannah Kirshner: Great! 楽しみです *I’m excited*

**Justine Paradis: The mountain orchard, where, when Masanobu Fukuoka quit his job to start experimenting with natural farming, he killed *four hundred* of his father’s trees. But it’s also where he eventually figured out how to work in cooperation with the existing ecosystem.**

**And where Hiroki Fukuoka now grows most of his citrus.**

**Here’s Hannah again, in a little van, rattling its way up the mountain.**

AMBI: the little van rattling up the narrow winding road to the mountain

**While we drive up the narrow winding road, I ask Hiroki-san about something in *The One-Straw Revolution*. Masanobu-san claimed that his farm’s yields were equal to or superior to nearby farms that used commercial chemicals and processes.**

**Is that really possible?**

Hiroki Fukuoka: そうですね、同じ量を撮るのは無理ではないけど難しい.

*Right. It’s not impossible to get the same yields, but it’s hard.*

Hannah Kirshner: Ah. It's not impossible but difficult to have the same yields?

**Hannah Kirshner: Hiroki-san says that yes, it’s possible to have similar yields, but it takes skill, technique, and the ability to see. And realistically, the yield probably averages about 80% of what you’d get on a conventional. But the real challenge, he says….**

Hiroki Fukuoka: .見た目の問題ですね、サイズであったり、味であったり、汚れであったり。その結果、そのままの農法では、難しい、今の世の中では、となります。そうですね、そこは、作ることじゃなくて、販売する技術。

*Whether because of how it looks, or its size, or the taste, or whether its dirty or damaged. As a result it’s difficult in today’s world, to make it work. Not the growing, but the selling.*

**… is that it’s not as easy to *sell* the produce.**

**Most Japanese supermarkets sell huge perfectly uniform fruits and vegetables, wrapped in styrofoam and plastic—even bananas. The expectations of both consumers and retailers make it hard for farmers to sell fruit that’s the wrong size or shape. Masanobu-san pointed out what a waste that was. And he also got frustrated with retailers who went too far in the other direction – *marketing* his produce as an expensive specialty good. He argued that since his method required fewer materials and less labor, the produce should actually be LESS expensive for consumers.**

AMBI: Car sound

**While we’re chatting, we pass other farmers’ kiwi orchards, and bamboo groves, and then some tree plantations and forest. It takes about ten minutes to reach the top of the mountain.**

Hiroki Fukuoka: My farm!

Hannah Kirshner: Oh, this is your farm. Oh, we're really high up.

**Hannah Kirshner: From up here, You can see across the Seto Inland Sea to Hiroshima prefecture.**

AMBI: getting out of the car

Orchard ambi: birds

**Hannah Kirshner: The citrus orchard is even more wild than I expected. More like... sort of an open forest, with dozens of varieties of citrus. With soft grasses and bushy vines growing between them. There are butterflies and dragonflies landing on the leaves. I feel like I’ve stepped into the book! And then I notice it:**

Hannah Kirshner: Oh, is that daikon? Oh, I see. Wow, so there's just vegetables all in between the trees!

**Hannah Kirshner: Masanobu-san grew vegetables between the trees in the orchard. He described scattering vegetable seeds here and there on the hillside, sometimes by tossing clay seed balls. He never cleared the ground, and he said the vegetables grew surprisingly strong—and flavorful.**

**Hiroki-san still does this – and finding the vegetables among the trees is like foraging.**

Hannah Kirshner: What vegetables are there?

Hiroki Fukuoka: 大根は、種が落ちてまた生えてくるんですけど、他に種で生えてこないのは、ほうれん草とか、

*With daikon, the seeds will fall to the ground and then produce new plants, but there are other vegetables that don’t grow from seed, like spinach…*

 **I see the leaves of burdock and daikon radish. And Hiroki-san tells me there are a couple kinds of beans, and spinach—ten kinds of vegetables in all.**

Hannah Kirshner: carrots?

Hiroki Fukuoka: 人参も少しあります。そうですね、簡単のが、難しいのが、

*We have a few carrots*

**He does harvest some of these things to eat, and occasionally sells some of them.**

Hiroki Fukuoka: 野菜の種が交雑すると、どんどん先祖返りしていくんですよ。で、これらを最初はたかなであったり、カブであったり、したんだけど、今はこういうなかなかたべれない野菜、

*Once the vegetable seeds begin to cross-breed, you start seeing increasing amounts of atavism. So, these might once have been mustard (takana), or turnips, or what have you, but now they’ve become basically inedible vegetables.*

**But the point of these vegetables isn’t really to eat them; they do a lot of work to improve the soil. Some of the root vegetables go unharvested, and they rot and become like sponges. They allow water and air to penetrate the earth. The beans and peas: they pull nitrogen from the air, and it becomes part of the soil when they decompose.**

Orchard ambi

**The orchard is peaceful and thriving.**

**But it took Masanobu-san and Hiroki-san decades to get here. Years of experiments…. Those lessons can’t just be applied overnight to other places – or to very different kinds of farms, like, vast corn and soy fields in the US. It takes time to learn to work with the rhythms of each microclimate, to find a balance that doesn’t depend on technology. And getting there usually entails losses that it’s hard to imagine large-scale commercial farms taking on.**

**It’s challenging enough for the weekend farmer, impatient to get started, who decides to speed up the process with plowing… or, flustered by insects eating their crops, chooses the convenience of pesticides.**

**And so, even if it COULD be more widely adopted, *shizen noho* remains pretty fringe.**

MUSIC FADE: Kern, Blue Dot Sessions

**Looking around the orchard, I don’t see the rustic huts that Masanobu-san described, where people used to stay when they made the pilgrimage to learn from him…. but there’s a new hut with big windows overlooking the view of the inland sea. It has a tiny kitchen, and this is where they take breaks from the summer heat.**

**There are some seed balls on the ground in front, and Hiroki-san says his 8-year-old son was making them with his friends a few days ago.**

# AMBI: Door of hut slides open, murmurs from inside the hut

**Akiko-san, Hiroki-san’s wife, is waiting for us inside the hut, and she pours us hibiscus tea and serves crackers with jam she made from hibiscus flowers.**

AMBI: Akiko-san pours tea

**I ask about how they eat, because Masanobu-san was concerned not just with farming naturally, but LIVING naturally. And he believed diet was part of that. He could be pretty extreme! He wrote,“When people rejected natural food and took up refined food instead, society set out on a path toward its own destruction. This is because such food is not the product of true culture.”**

**Anyway. Hiroki-san says he gets up early, so he makes his own breakfast.**

Hiroki Fukuoka: わかめスープで わかめを刻んで、昆布を入れて、醤油をたらしてぐらい、シンプルな

*Wakame soup. I slice some wakame, add some konbu, a bit of shōyu...very simple.*

**Hannah Kirshner: Today it was simple seaweed soup—and not brown rice, as Masanobu-san advocated, but bread.**

Hiroki Fukuoka: 今日の朝パンですね。

*Hmm, today I ate bread.*

**Akiko-san and Hiroki-san tell me they grow about half of what they eat but the rest comes from the supermarket. They like to buy organic, to support like-minded farmers, but they don’t worry about it too much.**

Hiroki Fukuoka: 全然買いに行きますね。特別こだわって、チョイスして、吟味して、食べるものをそんなにストイックには捉えてないですね。全然、

*Oh, we definitely go shopping. We’re not stoic--we don’t obsess about selecting, choosing, being picky.*

**Hannah Kirshner: But what I really love…**

Hiroki Fukuoka: ジャンクフードも食べることもあるし、

*I even eat junk food!*

**… is hearing that Hiroki-san likes junk food.**

MUSIC: Rumoi Night, Blue Dot Sessions

**Hannah Kirshner: I ask him about Masanobu-san, did he eat junk food? And Hiroki-san tells me his grandfather had a real sweet tooth. He loved the sweets, like you know, the gifts people would bring when they visited the farm. And he drank *a lot* of coffee—usually instant coffee. He’d make himself five cups a day and put a ton of sugar in it.**

**It was worth coming all this way just to hear that!!! Masanobu-san can seem like a mythical figure. It's easy to forget that behind *The One-Straw Revolution* was a real person. Someone who was maybe a little contradictory.**

Hannah Kirshner: So when you were a child, what did you think of your grandfather? Were you close with him?

Hiroki Fukuoka: 小さい時は、すごく優しいおじいさん、多分みなさん世界中「グランドファザー」＝優しくて、大好きなおじいさん、そんなイメージでしたね。怒られない、悪さをしても許してくれる、そんな存在でしたね。

*As a kid, I thought he was a really kind and gentle granddad--basically, the classic image of the kind, beloved grandfather that I think everyone around the world probably knows. He never got mad at me, even when I did something bad he forgave me--that was the kind of person he was.*

**Hannah Kirshner: Hiroki-san says Masanobu-san might have had a stoic image, but—and I’m quoting now— “he was a really kind and gentle granddad--basically, the classic image of the kind, beloved grandfather that I think everyone around the world probably knows.”**

**Hiroki-san *is* carrying on his grandfather’s legacy, but he doesn’t do every little thing the same way. He has a different relationship with *shizen noho*.**

**He says, “Masanobu investigated, researched, thought about how to grow things using natural methods, and once he figured one thing out, then he went on to think about and explore the next thing.”**

**Essentially, he was a philosopher. But Hiroki-san is a farmer.**

**Farming is how Hiroki-san makes a living, and supports his family—pretty comfortably it seems. He needs to be able to grow the same crop year after year… and he needs to sell it.**

Hiroki Fukuoka: その自然農法いうのは提唱はしたけど、そこまで完成。。。この辺りはいうような話になりますね [laughter]、そうですね、この辺り、ん、どうかな、その辺りは私として色々まだ考える余地はあったんじゃないかな、と思っていて、で、その辺りを色々考えていますね。

 *He was a strong proponent of natural farming, but whether he actually achieved that...well, this is a bit of an awkward conversation [laughter], but, I suppose what I’m trying to say is that I think there’s still a lot of room to think about how to do this work, about how to achieve his ideas.*

**Hannah Kirshner: Hiroki-san says his grandfather was, and now I’m quoting, “...a strong proponent of natural farming, but whether he actually achieved that...well, this is a bit of an awkward conversation, but, I suppose what I’m trying to say is that I think there’s still *a lot* of room to think about how to do this work.”**

MUSIC: Cach, Blue Dot Sessions

**He says: other approaches, like permaculture and regenerative agriculture – they’re paths too. They’re all climbing the same mountain, he says, even if their route is different.**

Hiroki Fukuoka: かわりに、その思想の中に真実、真理があるのではないかと私は考えてきました 。それを私なりに、私の人生にどうそれを取り入れていくかという形となって、それが農業、食を作ること、

*But I have come to believe that there is a core of reality, a truth in Masanobu’s ideas. And based on that, I’ve tried to think about how I can incorporate those ideas in my own way, into my own life--through farming, growing food.*

**Hiroki-san says, “I have come to believe that there is a core of reality, a truth in Masanobu’s ideas. And based on that, I’ve tried to think about how I can incorporate those ideas in my own way, into my own life – through farming, growing food.”**

MUSIC SWELL

AMBI: Orchard

**Justine Paradis: Writer Hannah Kirshner.**

**Masanobu Fukuoka expressed that he did NOT like to be imitated. That he grew frustrated when he was – when students focused on HIM rather than his message: to live with nature.**

 **“No, there is nothing special about me,” he wrote. “But what I have glimpsed is vastly important.”[[16]](#footnote-16)**

MUSIC SWELL AND FADE

AMBI: Orchard

**CREDITS**

**That was the second and final episode of our series on Masanobu Fukuoka and his method of “do-nothing farming.” For more reading, pictures, and a way to sign up for the podcast newsletter, visit our website – outsideinradio.org.**

**This episode was produced in collaboration with Hannah Kirshner. Her book is called *Water, Wood, and Wild Things: Learning Craft and Cultivation in a Japanese Mountain Town.***

**It was written and reported by Hannah Kirshner and me, Justine Paradis. I also mixed and produced the episode. We were edited by Taylor Quimby, with additional editing from Felix Poon and Outside/In’s executive producer, Rebecca Lavoie.**

**Translation help from Michael Thornton.**

**Special thanks to Tim Crews and the Land Institute, ethnobotanist Justin Robinson, Jeffrey Gray of Fenlake Farm, Paul Quirk of Ishiharaya farm, Bill Vitek, and Atsushi Tada and Taro Nakamura, who work with Masanobu Fukuoka Natural Farm.**

**Music in this episode from Patrick Patrikios and Blue Dot Sessions. Our Theme Music is by Breakmaster Cylinder.**

**Outside/In is a member-supported podcast. To support our work, we rely on listeners like you, making the leap to support the show by donating , if you’re able – you can do that at outsideinradio.org.**

**And thank you so much.**

**Outside/In is a production of New Hampshire Public Radio.**

1. Nardi, James B. *Life in the Soil: A Guide for Naturalists and Gardeners*. University of Chicago Press, 2007. Pages 240-241. [↑](#footnote-ref-1)
2. Mulvihill, Kevin. “Soil Erosion 101.” [National Resources Defense Council.](https://www.nrdc.org/stories/soil-erosion-101) 1 June 2021. Accessed 21 December 2021. [↑](#footnote-ref-2)
3. Kohnke, Helmut and Franzmeier, D.P. *Soil Science Simplified: Fourth Edition*. Waveland Press, Long Grove, Illinois. 1995. Page 121. [↑](#footnote-ref-3)
4. Fukuoka, Masanobu. *The One-Straw Revolution.* NYRB, 2009. New York. (Original work published Rodale Press, 1978. Emmaus, Pennsylvania). Page 8. [↑](#footnote-ref-4)
5. Fukuoka, p13. [↑](#footnote-ref-5)
6. Korn, Larry. *The One-Straw Revolutionary: The Philosophy and Work of Masanobu Fukuoka.* Chelsea Green Publishing, 2015. White River Junction, Vermont. Page 13. [↑](#footnote-ref-6)
7. Korn, p13-14. [↑](#footnote-ref-7)
8. Takeshi Watanabe and personal observation from Hannah Kirshner. [↑](#footnote-ref-8)
9. Mason, Robert J. “Whither Japan’s Environmental Movement? An Assessment of Problems and Prospects at the National Level.” *Pacific Affairs* [Vol. 72, No. 2 (Summer, 1999)](https://www.jstor.org/stable/i326000), pp. 187-207. [↑](#footnote-ref-9)
10. Korn, p69 [↑](#footnote-ref-10)
11. Fukuoka, p1. [↑](#footnote-ref-11)
12. Fukuoka, p118. [↑](#footnote-ref-12)
13. Fukuoka, Masanobu. *The Natural Way of Farming: The Theory and Practice of Green Philosophy.* Japan Publications, Inc., 1985. Tokyo and New York.Page 5. [↑](#footnote-ref-13)
14. Ibid.,p36. [↑](#footnote-ref-14)
15. Email with Taro Nakamura 12/22/2021. Hiroki Fukuoka interview: 70% of crop is citrus, 20% is rice and barley, the rest are a mix of cucumbers, leafy greens, and small fruits. [↑](#footnote-ref-15)
16. Fukuoka, p10. [↑](#footnote-ref-16)