

The Great Simplification

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[00:00:00] **Andrew Millison:** The ripple effects of restoring land, bridges all the way into the worldwide geopolitics because people that are on land that is productive, they don't need to migrate. A lot of the stresses of the world is about migration and all the pressures that puts on both the societies from where people are leaving from and going to.

[00:00:23] When you actually have land that is abundant and productive and people see a future there, then they don't leave.

[00:00:36] **Nate Hagens:** Joining me today for a second time is Permaculturist and educator Andrew Millen for an update on some recent projects that he's been documenting, including the massive scale ongoing project in Africa called the Great Green Wall that is aiming to hold back the expansion of the Sahara Desert. Andrew Millen is, instructor in the horticulture department at Oregon State University for the last 15 years where he founded the OSU Permaculture Design, which runs the first online university Permaculture Program, along with Andrew's teaching, he also creates short documentary videos of permaculture projects around the world in places like Mexico, Egypt, Cuba, Senegal, and India, which he publishes on a very popular YouTube channel.

[00:01:32] You can find the link to Andrew's work in the description of this episode as my own podcast grows. It is my hope to begin more and more covering the responses. Our human predicament, but especially ones that are ecological, effective and scalable. The projects that Andrew discusses in this episode are great examples of such possibilities and demonstrates that actions can be taken at every level from individuals in small groups all the way to governments and international organizations.

[00:02:07] With that, please welcome Andrew Mill. Andrew Millen, you know, you've hit the big time when you come back as a return guest on the great simplification.

[00:02:17] **Andrew Millison:** Oh, real? Is that so? Huh? No, you

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[00:02:19] **Nate Hagens:** don't do returns. I have, a fraction of your viewers. I was just kidding. Yeah. thank you for coming back. It's been, two years when you first came on this show, you gave us an overview of teaching permaculture and documenting, permaculture projects all over the world, especially in India.

[00:02:38] And today, because of all the craziness and, untethered, polarization and, drama and anxiety in the world, I came across, a few weeks ago, some of your recent videos, which were just so inspiring. And I would like you to give our viewers an overview of some really good pro ecology, pro future things that are happening in the world.

[00:03:06] So welcome back my friend.

[00:03:07] **Andrew Millison:** Thank you so much for having me. It's really great to be back talking to you, and I've been watching your podcast as well and learning a lot from it.

[00:03:13] **Nate Hagens:** Thank you. I still believe it's important to, lay out the constraints, and boundaries and, initial conditions of the moment we're in.

[00:03:24] But increasingly, I want to highlight, what's going on that's positive and at least directionally aligned with, what more humans need to do. Yeah. so, so with that, I'll start with the video I saw a few weeks ago had to do with, you working in the Sub-Saharan African region, which includes quite a few countries, and you highlighted something, if I recall, was called the Great Green Wall in an effort to, Hold off, the expansion of the Sahara Desert. Can, maybe we start with that. Can you tell us a bit about why the Sahara Desert is expanding and what dangers come from that and what, you're working on in that region?

[00:04:07] **Andrew Millison:** Yeah, so the Sahara Desert, I just looked up a few facts here before the podcast to, be able to really give you a sense of scale.

[00:04:16] The Sahara Desert is about the size of the continental us. Whoa. Yeah, I would never have guessed that. Yeah. The maps are sort of skewed when you look at it because they have to change the amount of space between the latitudes to make it all fit on a piece of paper. Well, the whole continent of Africa is like enormous.

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[00:04:36] It is enormous. And the Sahara Desert is a vast area, and in the last a hundred years it has expanded by 10%, so about 1% per decade it's expanded. Do you know the answer to this? Not to put you on the spot, but when was it not desert? I can't actually tell you the dates, but I will tell you that when I was in the western desert of Egypt, in the DLA Oasis doing a project, during Covid a few years ago, we visited some old sites that had pictures of giraffes and elephants.

[00:05:13] You know, in an area that is now a desert in an area that now when I was there, had not received rain for 13 years. So not that long ago then, not that long ago in human memory, this was not a desert. Right. Of course, there's been humans in this part of the world for as long as there's been humans. So yeah, not that long ago it was not a desert.

[00:05:35] And then I can't really tell you exactly when it became a desert. but it's been a desert for, you know, modern history basically. And, so it's expanded year after year, and in a hundred years it expanded by 10%, which is about the area of Texas. So if you've ever driven across Texas, I mean, it is a vast state.

[00:06:00] It takes two days to drive across Texas. That's how much the Sahara Desert has pushed to the south. Right. And the impact on people's lives. I mean, imagine people and animals. People and animals. Right. And you know, when you're talking about the expansion of the desert, you know, from what I've experienced in my time, both in Egypt as well as in Niger and Chad and, and Senegal, I mean, you're talking about dunes literally blowing in and covering over agricultural areas.

[00:06:34] You're talking about trees being cut, soils drying up. and then the vegetative cover being eliminated. You're talking about severe overgrazing over cropping. And you know, there's a resource extraction element that is pretty, a pretty big reason for the expansion of the desert. You know, just human uses are really causing a huge impact.

[00:07:01] And, and we could look to colonialism. We could look to, I believe it was 1898, that the European powers got together in Germany and divided up the nations of subset of, Africa for the most part to see which, you know, which colonial power would get which piece of land. And they pretty much divided those lands based on the logistics of European powers.

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[00:07:31] It was sort of like a, okay, let's carve this up for our own needs, regardless of the cultural, political, social structure. So one contribution to the destruction of the land stewardship of this region was the fragmentation into. Pretty arbitrary nation states. So that, I mean, you can't blame it solely on that.

[00:08:00] There's a lot of factors that went into the desertification.

[00:08:03] **Nate Hagens:** So, we'll put a, map up on screen, but what are the, what are the countries that are

[00:08:09] **Andrew Millison:** involved? So, the area that I've been in is the Sahel Zone. So the Sahel Zone is the southern edge of the Sahara, right? So we've got Senegal, we've got Mali, Niger, Chad, Sudan, Burkina Faso's tucked in there as well.

[00:08:27] And so these, are huge countries and each one has a different chunk of, you know, how much of it is in the Sahara versus the Sahel. So I started, you know, I've been now twice on two extended trips with the United Nations World Food Program, looking at the. Unbelievable work that they're doing to restore vast areas of land, working with the governments, working with the people in these areas.

[00:08:57] And, and that's really the basis of the videos. And, you know, I'll just say the videos if you haven't watched them, for the listeners, they've struck a chord in people and I've had higher viewership on these videos by far than anything else I've ever done. Why do you think that is? I think there's a couple reasons.

[00:09:16] One, the Great Green Wall of Africa is the largest biological design project on the planet, right? If you look at the totality of creating a wall, a buffer of vegetation, of trees, across the entire width of the continent of Africa, I mean, it is just a visionary epic scale project. So that's very fascinating to people.

[00:09:42] But I think the part. About the UN is that seeing the world, the United Nations World Food Program, involved in land restoration, involved in bringing social cohesion, bringing, ecological, agricultural and economic prosperity to some of the most hard hit regions on the planet. I think that people see that and they're like, that's what a world body should be doing.

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[00:10:12] Like if we have a United Nations, a collection of countries that like represents the will of the world, that's the kind of work they should be doing is fixing some of our most dire problems with ecological solutions. So I

[00:10:25] **Nate Hagens:** have so many questions.

[00:10:28] **Andrew Millison:** Yeah. Andrew, what, is the Great Green Wall? So, the Great Green Wall is, it's a vision really, of creating a buffer of vegetation.

[00:10:39] To the, on the southern edge of the Sahara Desert. In the Sahel, zone is between the Sahara and the tropical savanna. So it's like the part that's being deserted as the Sahara expands. So in the Sahel to actually hold back the expansion of the Sahara Desert, at first it was sort of put forth as like a wall of trees, so to speak.

[00:11:00] But there was a lot of failures early on. 'cause you can't just plant trees and not have them be tied into the economy and the social structure. The people live there, the project will fail. So the Great Green Wall has really become more of a mosaic of different restoration, tree planting, agroecology, agroforestry, land restoration projects that is all in this zone with the goal of keeping the Sahara in its current.

[00:11:35] Footprint because it's still expanding.

[00:11:37] **Nate Hagens:** I'll just start with a dumb question. If you plant a tree on the border of the Sahara Desert, won't it dry up and die?

[00:11:47] **Andrew Millison:** Yeah. If you just plant a tree in isolation with no other sort of structures around and no human interaction, chances are it's going to die.

[00:11:59] Right? And that's what happened. They feel like everybody was very gung-ho about the Great Green Wall. They went and planted all these trees and, you know, they had a very high, mortality rate. And so the Great Green Wall kind of got a bad wrap in the beginning, but I would say what's happening now is more like Great Green Wall 2.0, which is, using the most cutting edge ecological.

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[00:12:25] Permaculture type of techniques to establish trees in a way that's utilizing water harvesting, utilizing, soil building, land restoration, restoring the microbiology of the soils, the hydrology, the water retention, bringing in really hardy species and building these agro ecological systems that actually are part now of the culture of the people there that are harmonized with the needs of the people.

[00:12:56] The needs of the people for food, for economy, and for stability and even for peace is, which we can get into a little bit later.

[00:13:03] **Nate Hagens:** So what is your role in this? Just documenting what's going on with videos and, sharing it.

[00:13:09] **Andrew Millison:** Yeah, I mean, basically I am like a, you might say a translator and an amplifier.

[00:13:16] Of this work. Now, like I said, the the first video that we did on this topic, it's called How the UN Is Holding Back the Sahara Desert. We got almost, we have almost 16 million views on this video. Whoa. And so. it is now by far the largest piece of propaganda you might say, or you know, educational material about this project.

[00:13:40] **Nate Hagens:** Well, in addition to what you were saying before, that people like to, see what's going on and they, they think this is what a united, governmental body should be doing. It also is an advertisement for humans improving the land that we're on in a ecological pro future in service of life thing that a lot of people, even if they don't follow your podcast or mine, kind of feel this disconnection with nature and, maybe that you're tapping into something, that really needs to be born.

[00:14:17] **Andrew Millison:** Yeah, because the ripple effects of. Restoring land. it, it bridges all the way into the, like worldwide geopolitics in a sense, because people that are on land that is productive don't need to leave. They don't need to migrate. So we look at a lot of the stresses of the world, both in Europe and the US, is about migration, illegal migration, you know, and all the pressures that puts on society, both the societies from where people are leaving from and going to.

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[00:14:54] And so when you actually have a. Land that is abundant and productive and people see a future there, then they don't

[00:15:04] **Nate Hagens:** leave. So, so how many people are involved in this project across all these countries? There's the UN people, but what about the local people?

[00:15:13] **Andrew Millison:** Yeah, so I don't really have a number on how many local people are involved in these projects.

[00:15:18] Right. But, and some of the countries are, have a lot of instability right now, and it's more difficult to make progress. For instance, right in this zone we have Sudan where we have the largest war on the planet. So if anything, they're going backwards right now. We also have Mali, which is, has been, have very.

[00:15:40] Unstable with, jihadist insurgency. Burkina Faso also has had a lot of, really big instability. So, but the countries that are more stable are making incredible progress. And so I started in Senegal where they're, they are actually, recognized as having the most, as the only country that's actually meeting their stated goals for, progress in the Great Green Wall.

[00:16:08] So this involves, well, the other thing to realize, I guess, is important is, that these are not highly populated areas because they're very marginal. So you have the populations that live there, which are basically subsistence farmers. And then you have, you know, cities interspersed, but you also have a population of nomadic herders that are constantly with the, as the rains come, they're moving up into the Sahara.

[00:16:36] And then as the rains recede, there's a three month rainy season, right? And then there's a nine month dry season. So as a nine month dry season kicks in these people go, are crossing national boundaries and there's about 30 million nomadic herders in the Sahel zone that are moving back and forth throughout country.

[00:16:55] So that's how many nomadic herders you have. And these people, of course, are gonna be impacted because creating stable agro ecosystems in this region is, you know, part of the food source for these large herds. Of cattle, of camels.

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[00:17:11] **Nate Hagens:** So tell me what's going on from a permaculture standpoint with, this great green wall, and planting trees.

[00:17:18] Like what sort of techniques are being used to make, this vegetation come to life again?

[00:17:24] **Andrew Millison:** So the work that I saw in the J was the most mature and sophisticated example thus far, where they are using these water harvesting half moons for the most part among other structures. But that's kind of their main tool in their toolbox.

[00:17:40] They can range anywhere from three to five meters wide and they're basically a half moon that is intercepting the flow of water. There's many different styles of these half moons depending on what you're gonna do, but the ones that are most relevant to the Great Green Wall are, creating these, silver pasture systems, which means that they are planting trees and they're also planting grasses.

[00:18:09] So it's. Productive for animal feed. So there's a half moon. Yeah. And then

[00:18:15] **Nate Hagens:** a little ways away. There's another half moon and another. Yeah. What's the distance between the half moons?

[00:18:20] **Andrew Millison:** Well, it depends on what the rainfall is like in that particular area. So where I was in Chad, where it was a Rainier area, the half moons were smaller and more close together because the amount of rains would fill those up.

[00:18:34] But as you get into the more desert, so they were almost like, you know, three meters wide and just almost interconnected. One after another, one after another, row, Like the entire landscape was made into these. They look like fish scales. Right. But as you get into the more arid regions, you're gonna have a bigger half moon.

[00:18:51] 'cause you need more of a catchment area to feed the center of the half moon.

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[00:18:55] **Nate Hagens:** So, so, forgive my kindergarten like questions. So this is an example of humans using a simple technology. I. To change the ecosystem to be better, more, productive and more regenerative. Full stop.

[00:19:13] **Andrew Millison:** Yeah. And I would actually, I would go against the idea that it's a simple technology necessarily because there's a surprising amount of sophistication involved in which type of half moon, which the variations, the spacing, the intercept.

[00:19:30] So is

[00:19:30] **Nate Hagens:** this, is this half Moon technology, is this a new thing like in the last 20, 30 years?

[00:19:35] **Andrew Millison:** Well, it's an ancient technology, but it has been evolved through standard scientific trial and error by the World Food Program, by the people practicing to, so, so it's an ancient technology that's indigenous to the region, basically.

[00:19:52] And

[00:19:52] **Nate Hagens:** would, does this, would this apply to any arid regions in North America?

[00:19:56] **Andrew Millison:** Yeah, basically, I. You could pretty much apply this to any arid region. The type of water harvesting structures that we teach about in permaculture is just talking about taking water from runoff from a large area and concentrating it into a place where it's gonna be wetter.

[00:20:13] **Nate Hagens:** And once you do that, how long does it take to see improvements, to the soil and have things start growing again?

[00:20:18] **Andrew Millison:** It is instantaneous. Once the rains come, I mean, basically they're also spreading grass seed. So they're putting in these half moons, they're spreading grass seed and or planting trees.

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[00:20:32] Then the rains come and you instantaneously have a flush of graphs where. Previously you may have just had barren, compacted soil and the grass is what the cattles and

[00:20:41] **Nate Hagens:** camels

[00:20:42] **Andrew Millison:** eat to start with. Yes. But then, what's happening is they're planting these hardy, thorny desert trees, these different types of acacias and that are native to the area.

[00:20:54] And so in the wet season, the grasses are growing the ca, the cattle, the goats, the camels are getting fat. But then in the dry season, these thorny trees are growing up. They're establishing canopy, and it's a pla, it's a food source for camels and goats who can eat these gnarly, thorny trees. So it provides, a year-round food source.

[00:21:22] With, pulses of grasses in the wet season,

[00:21:26] **Nate Hagens:** how does this change the, nutrition, not for animals, but for humans, in the region? What, to sorts of improvements to like nutrition and hunger are, happening?

[00:21:38] **Andrew Millison:** Well, in the regions, in like in these year where they actually have the scale that can feed the, populations.

[00:21:47] I mean, they have 300,000 hectares that they've put into these structures. So we're talking like, really that's 750,000 acres. I'd have to look up what, how many square miles that is. We're talking about a large area. So when you actually get it at scale, you have. You have whole populations of people that were previously on long-term emergency food assistance.

[00:22:09] They were being kept alive by the World Food Program. So the average, I think of the last five years in Niger alone, there were 3 million people that were on permanent food assistance, right? These projects have now taken 500,000 people off of the books that no longer need permanent food assistance com, completely free of permanent food assistance.

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[00:22:32] So it's taking a situation where you had like dire malnutrition and hunger, like, you know, we showed in the video that, a, a center where they had been, you know, tracking the nutrition of babies and that they had, prior to these projects. They had nine out of 10 of these babies were malnourished.

[00:22:53] Right. To some degree. And so now it's been a complete turnaround in the places where they've done large tracks of this systems, and then it's matured into a forest where now it's like, it's basically like a, tropical savanna, like, you know, woodland dense with trees and many different plants. How

[00:23:14] **Nate Hagens:** did you, like, I mean, you're at Oregon State Yeah.

[00:23:17] near Corvallis, and you have a lot of experience in India. How did you, like, Hey, I wanna go look at the great Green Wall of Africa.

[00:23:25] **Andrew Millison:** Yeah. Well, I was invited by, by a organization first to go to Senegal called Planet Wild to do some documentation of a different project, a really cool food forest project by an organization called Trees for the Future.

[00:23:40] And since I was gonna Senegal, I have a great colleague, her name's Natalie Topa, and she. I don't know if you've ever heard of her. She would actually be someone excellent person to have on the show. she's very brilliant. She's, American by birth. She's been in, living in, in Kenya for the last 20 years.

[00:23:58] She works with the World Food Program. She's a permaculture person. She's worked with the Danish Refugee Council and now she works with the resilience program of the World Food Program. And so I got in touch with her and I was like, Natalie, I've seen on social media, I've seen all of these images of these cool half moon landscapes.

[00:24:19] Can you hook me up with, can I go see one of these things? And so she connected me with the World Food Program in Senegal because I'm an instructor at Oregon State University. It's kind of like a calling card where I can get in touch and I'm saying, Hey, I'm a university instructor. I do some filming.

[00:24:34] I've got this YouTube channel. I wanna come see this project. And people are usually very happy to invite me in. So that was the first. And I did one day of

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filming. I mean, we drove to the border of Senegal and Mauritania is another country, by the way, on the list of countries that are within this belt.

[00:24:52] And we did one day of filming. And so I, and it was a small project. It was only 30 hectares and it was two years old. So it was like really not very impressive at all compared to what they've done. But this is the one that the video got, you know, almost 16 million views now. And so, they, the World Food Program and the people that had really facilitated this whole resilience programming for the last, I mean, it started Ethiopia in the nineties and it's been going for a long time.

[00:25:23] They were like, man. This project that you showed that had so much attention is like really small scale and not very impressive compared to what we've done. What you really need to do if this is, if you're getting this kind of viewership on our stuff, then you need to come to Niger and you need to come to Chad and you need to see where this is really.

[00:25:47] Popping off on a massive scale. And so that's where they invited me to come. And it all worked out. It was, you know, not easy to get there, but So other than viewing your

[00:25:56] **Nate Hagens:** YouTube channel Yeah, I hadn't really heard about this. Yeah. Are there a sense of pride and awareness in these countries, of these projects?

[00:26:04] **Andrew Millison:** Well, yeah. I mean certainly Niger is the country that is way ahead of the pack and this has become a, center point of how they are dealing with malnutrition and poverty in that country. And, climate. And climate, yeah. I mean, so I mean, desertification climate for them it's like kind of wrapped up into one thing because, you know, the, result of hotter temperatures, erratic rainfall is going to be increased desertification.

[00:26:34] 'cause it's just more stresses on the environment, you know? so the government of Niger is like all in basically. And they are, very well trained at this point. I mean, they have their internal knowledge about how to implement, install, and monitor these systems and make sure that they don't get cut down and make sure that they last,

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[00:26:58] **Nate Hagens:** so, so, being, an ecologist or a permaculturalist in Yeah.

[00:27:03] Niger might now have the social status of a real estate developer or a oil tycoon.

[00:27:08] **Andrew Millison:** Well, I mean, if you watch the video, the one that's, it's called, inside Africa's Food Forest Mega Project is the title I interview this the, the lead forester of the state of Madi. And I also interviewed, and I didn't put it on the film, but I also interviewed the Lead Forester, the state of Zaire.

[00:27:28] And I mean, these guys are, it's interesting 'cause you know, it, there was a military coup. In 2023 in Deger. And so the military took over the country and it still rules the country right now. So these foresters are kind of like in military fatigue fatigues, you know, they're, part of this government infrastructure and these guys are, I mean, they are really smart.

[00:27:50] They know what they are doing. They know what's going on.

[00:27:54] **Nate Hagens:** From your expertise, as a permacultural expert, what, ecological benefits have you witnessed as a result of these projects? Like in terms of biodiversity or cooler temperatures or water table recharging, or are those sorts of things?

[00:28:10] **Andrew Millison:** Yeah, I mean, I mean, all of the above. Basically the, you know, these structures, you put these, you know, you think about you have all of these half moon scales in this whole landscape. They become a net for water. Collect water for fertility that blows in and settles in these half moons, and then they're planted, and then the vegetation that you plant becomes a net for biodiversity to just be caught up in this forest system.

[00:28:41] So in, in the one, the site I've visited, they've had the return of native monkeys to an area that was like bear compacted soil. Now it's a forest. They've got native monkeys. They've got, I mean, the bird song is, you know, so loud you can barely hear yourself. There's insects of all kinds. I mean, there's so many creatures moving in.

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[00:29:03] The temperature effects in the, you know, the areas themselves are, you know, like. 15 to 20 degrees. I mean, really dramatically cooler the ground, you know, when they're measuring the NDVI, which is like the vegetative cover the ground is now 100% covered with vegetation.

[00:29:24] **Nate Hagens:** So let's say they put a strip of these half Moon Silva cultures.

[00:29:28] Yeah. And what you say happens. Yeah. Then is the next step to put a strip further north and do it like that?

[00:29:36] **Andrew Millison:** Well, I think that if they got to the level that we actually were ready for the next step. I mean it, we don't even really need to talk about that because just to get, I mean, we're talking about such a vast area just to get a strip across would be like a transformation of the entire region, the entire economy, the entire climate.

[00:29:57] You know, from there, I mean there's a point where you can only go so far north before you hit, an area that it just doesn't rain. Right. And you could argue that perhaps if you put Moret trees in, you may bring more rain into the Sahara. I mean, I don't really know because there's, you know, there's certain areas that, like the Sahara is a desert for kind of worldwide climate reasons as well.

[00:30:27] **Nate Hagens:** So, was the impetus of this the un or was it, a collaboration with the, governments within, Niger and Chad and other places?

[00:30:37] **Andrew Millison:** Well, I think that the stimulus on really the large scale. Projects was the un in part it was coming off of a nearly 30 year transformation in Ethiopia. So you remember back, you know, USA for Africa, feed the World, all that stuff.

[00:30:59] Back in, what was it, the eighties when the Ethiopian fa, there was a horrible famine. It wasn't just Ethiopia. There was a horrible long-term drought in this region. At the time, Ethiopia's the place that became the most well known, but the World Food Program. And, I mean specifically the guy that I traveled around with in Niger and Chad, who is the director of, the West African branch of the, resilience.

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[00:31:22] His name's Ucci and he. Started working in Ethiopia in the mid nineties, and they, they restored about 6 million hectares in Ethiopia, entire watersheds they brought back and they stabilized this entire system. And so coming off of that, they realized that they could apply a lot of this same, you know, these same types of systems in the rest of abs of, the Sahel.

[00:31:51] So I'm not sure, you know, like the details of who approached who or how it's actually evolved, but, 2014 is when it started in earnest. So,

[00:32:00] **Nate Hagens:** so what do you think the long-term impacts are, for the people who are living in these restored areas? And will they be able to keep it going? if the World Food Program,

[00:32:11] **Andrew Millison:** leaves the impacts are a total transformation from living in, a scarce.

[00:32:19] You know, pr, practicing subsistence agriculture in a very degraded ecosystem. leaving ha needing to leave when there was drought to go find work in other places, right? In the cities, you know, chronic malnutrition to now you basically have social cohesion. You have people sticking around, you have people well fed, you have increasing water tables, so people now are able to sink in borewells and, irrigate horticulture crops.

[00:32:53] It's like night and day

[00:32:54] **Nate Hagens:** is the difference for these people. Could you explain to me, since you have a very popular permaculture, podcast, the mechanics of why the water table is such that they can put in bore wells? Like what? What is happening? Because of these half moon structures that's changing the water table specifically.

[00:33:14] **Andrew Millison:** So previously before you have these structures in and you have a deserted landscape, the rain falls down on hard soil and it rushes away and it rushes down, down through streams to the nearest wash, the nearest R that it could find. And it scours, it creates erosion and it just exit the system as fast as possible

[00:33:34] **Nate Hagens:** and eventually goes to the ocean

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[00:33:36] **Andrew Millison:** eventually.

[00:33:37] Yeah. So here we're talking about the, Niger River. So eventually it will be leaving through Nigeria, you know, and all that. So when you put in all of these water harvesting structures over this vast landscape, the water is not exiting the system. Instead the water's pooling in these half moon water harvesting structures and it's soaking in and it's building up underground into a subsurface aquifer.

[00:34:05] So it's actually recharging the aquifer and it's. Recharging the areas that are downstream from the project as well. So suddenly where before you would drill and you wouldn't hit water. 'cause the water was just exiting the system before it ever soaked in. Now if you drill down, you hit this ever increasing aquifer, that's, you know, that's every rainy season.

[00:34:29] The water's recharging more and more basically,

[00:34:31] **Nate Hagens:** bud. If it only rains three months a year there, and they plant seeds and trees and the grasses grow and the trees grow, but then it doesn't rain again for nine months. How, do the trees and the grass stay alive? Just from the, water table underneath.

[00:34:47] So

[00:34:47] **Andrew Millison:** basically these are very hardy. Well, the grasses don't stay alive. I mean, the grasses are seasonal. I wanna mention one other thing that I actually didn't is I'm talking about one particular version, which is the perennial system. In the most recent video I did, which was from the border with Sudan and Chad, where they're working with refugees coming over, they're planting.

[00:35:10] Annual crops. They're planting sorghum, which is a native, very, drought, hearty grain in these half moons. So they're actually just using them as like direct annual cropping systems. That's, I just wanna kind of throw that out there 'cause it's not just perennials, but basically like I described in the dry season, there's all of these perennials that are growing and they do supply food for camels and goats, which are really important part of the diet there.

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[00:35:40] **Nate Hagens:** Is there a corollary to South America, because I've had a couple of guests on talking about how perilous the Amazon rainforest is and how the southern most, parts are turning into Savannah and I don't think most people realize how huge the central African rainforest is. So it sounds like this is almost a buffer.

[00:36:01] Like this project is, helpful to, ultimately the central African rainforest, which is just south of this. Does this, two questions. Yeah. Does this ultimately affect the weather in the future? Maybe. And is there a South American corollary to this sort of work? You know, there's a lot of

[00:36:21] **Andrew Millison:** comments on my video of like, if you get rid of the Sahara Desert, that's the source of the, you know, rain for the Amazon or something like that.

[00:36:30] Like that. There's some sort of re there's some sort of, there must be some popular YouTube videos about some sort of relationship between the Amazon, between the Sahara and the dust that comes from the Sahara and blows over the Amazon. but you know, I mean, as far as. Climate goes, you know, I don't know if you've talked to anybody about the biotic pump, but you know, when you have trees, they interact with atmospheric moisture, right?

[00:36:59] Trees, they exude small particles, pollen spores and mushroom spores and dust and bacteria that then can become the nuclei for raindrops trees. Avpo transpire water into the atmosphere, which then meet up with clouds moving, and that's, you know, part of the rain that falls is, rain that came from the forest and part of its rain that came, water that came through the atmosphere.

[00:37:26] So yeah, anytime that you're talking about a massive scale revegetation, you're going to have climatic effects, hopefully climatic effects that actually hold more moisture in the land system, which then makes it so the rains can be, more consistent now. This LA when I was there, so this is just last August and September, I mean, there was massive floods as I was, they ch I was almost like being chased by these floods as we went across.

[00:37:57] So I never got affected in a sense where I could, I filmed every day I was planning on filming, but I don't know if you saw some of the footage of, I mean if

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it, the, rains came all the way. They usually stop at the Sahel, but you had these cyclonic storms coming all the way up into the Sahara and you had places in the Sahara that got more rain than they'd had in, you know, 50, a hundred years.

[00:38:21] And there was all this footage of these like flooded, you know, lake beds that, you know, nobody in living memory could remember these lake beds having water in them. So, you know. There's going to be, there's erratic weather anyway. But I would say if anything, having these, this, you know, permanent vegetation here is gonna do more to stabilize that.

[00:38:43] It's certainly gonna be a flood mitigation when you do have heavy rains because instead of having all that water rushing out, it's going to be soaked into the ground.

[00:38:50] **Nate Hagens:** So is this a win-win story or is there conflicts and, dramas with the, humans in the area at all? I mean, from an ecological perspective, it sounds unbelievable.

[00:39:00] **Andrew Millison:** Yeah. Well there are a lot of nuances in this region that I discovered a lot of social, cultural nuances. And, you know, a big source of conflict is the stress that happens between herders and we're talking about these 30 million nomadic herders and settled farmers. Right. So herds come through with, I mean, very large herds.

[00:39:26] It's like kind of spectacular when you're there and you're like, wow, this is really intense. You know, lot huge animals. Well, there's 30 million herds. Yeah. Imagine how many animals they're herding. I don't know. Must more than 30 million. Must be a billion animals. I have no idea. Yeah. Right. So many animals.

[00:39:41] So, but it's interesting that this restoration work is actually, they're using it as peacemaking work between the farmers and the herders. So they are, creating like a ditch. This is the next video from the series I'm gonna be putting out about this topic. So, stay tuned for that one. But they're basically doing these restoration areas.

[00:40:05] They're digging a ditch. It's hard for the animals to get over. And then they're putting a water source for the animals outside of the restoration area so

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the herds don't need to cross through the restoration area to get to water. And then they are facilitating agreements between the tribal leaders of the villages and the herders.

[00:40:28] And so where they've done this, it's been very successful. They've brought, you know, farmer herder violence basically down to zero in these areas that they're doing this. But the nuance between, you know, another important aspect to understand is this is the fastest population growth area on the planet.

[00:40:53] I mean, this is the highest birth rate. So I mean, this is the highest birth rate. Niger has the highest birth rate on the planet. So at the same time, the farmer villages are expanding. Because they're having so many kids. So they're expanding, and then the herders, they leave and then they come back a year later, and like if the village expanded and suddenly the village has expanded into a place where the herders traditionally would go, and that's kind of the source of one of the sources of conflict there.

[00:41:20] So, you know, it's a delicate balance. They're certainly tackling it in areas and, their systems are working to stop farmer herd of conflict. But you can imagine that if you just pop in all this restoration, suddenly you have this protected area. Then you have all these herds show up and they're like, Hey, that's our land.

[00:41:44] Or Hey, this is where we've come for, you know, as long as we can remember. So, you know, there's a lot of dynamics.

[00:41:50] **Nate Hagens:** So how, these, Silviculture, techniques that you're describing and the fact that your video alone on that one project got 16 million views as an advertisement for doing permaculture in, degraded areas in the world is this, repeatable in other arid regions all around the world, the Middle East and Asia, and.

[00:42:16] South America.

[00:42:17] **Andrew Millison:** Yeah, absolutely. I mean, the techniques vary based on rainfall, based on soils, based on the seasonality of rainfall. You know, there's a lot of, like, it might not be that the half moon as a structure is appropriate. There's a

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lot of other structures that people use as well. They have like compartment buns, they call them, or they have, you know, check dams.

[00:42:42] I mean, there's a whole toolbox of these strategies. So, you know, but there's certainly a lot of places that yes, the half moons would, function really well, you know, but once you have all these half moons, I mean, you're talking about it has to be a non mechanized ma, you know, maintenance, because half moons like this, it, it needs to be in a place where you're talking about hand work, right?

[00:43:04] You're talking about people walking, you're talking about animals because you're not coming through with combines or any sort of, or tractors or any kind of machinery. You know, so, so that means that it's only in these types of places where, you know, people are still living. I mean, I wanna tell you a little fact.

[00:43:24] the country of Chad is, I think it's 9%. It's either nine or 11% of the total country has electricity. When you get into the rural areas, it's one, it's like 1.3% of the people have electricity. So it's so hard for people to imagine a place that is completely non industrialized. That, that there's just like very few motor vehicles.

[00:43:54] People are charging cell phones. Kind of funny. They're charging cell phones on, you know, solar panels. so, you know, it's, there's not, like, they're not, there's not industrial agriculture at any scale. It's subsistence farming, it's walking it's carts, you know, it's donkey carts, it's wagons.

[00:44:22] there's a few little vehicles in there, but you know, what an amazing experience for you. Yeah, it

[00:44:27] **Nate Hagens:** was pretty mind blowing. Yeah. I've been to like 20 countries in Africa, but mostly, central and, southern countries. and I've loved every, moment of it. So, it's funny that, with all the macro, geopolitical, biophysical things going on in the world, I dial in my permaculture friend to give me some good news about what's going on, in the world.

[00:44:56] You're working on other things too. I, think I, I saw that you're doing something with saltwater farming techniques. can you, update us on that?

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[00:45:04] **Andrew Millison:** Yeah. I did a video, down in southern Spain. In the, the southwestern corner of Spain where, in a, river delta where, they're actually, you know, they're utilizing halid plants.

[00:45:26] So halid plants are plants that actually can live in salt water or thrive in salt water. And so they're taking, you know, if you think about the low lying agricultural areas of the world, a lot of them were salty areas that were sort of reclaimed by building up these areas and draining the salt water and creating dikes.

[00:45:48] But they've always. You know, in areas especially where you have a tidal influence, you have the tides coming in, some sort of river delta, then you have the river pushing back down. There's all, there's this constant salt flow of water from the ocean coming inland with the tides. And you know, you have salt water infiltration into the groundwater.

[00:46:12] And so in these areas it's very difficult to, have agriculture production basically. But people of course, have tried with detrimental effects. And so, there's some real pioneers out there, that are basically creating, you know, finding and developing a plant palette of species that can live in these salt marsh conditions.

[00:46:38] Right as food crops for humans? Well, for now, the ones, that they're using in, the area that I visited in the video you're talking about, are actually used for animal feed. Okay. And so it is like part of the in animal industrial process. Well, they come in with combines and they'll like let this ecosystem grow.

[00:47:00] And then once a year they come in and they just cut the whole thing down. They harvest it and then they will use it and they will mix it into like pelletized animal feed. I think that given the amount of salt in these plants, they can use about 40% of an animal feed can be this without damaging the animals.

[00:47:18] So it is kind of contributing to like the animal industrial system, which does feed. A lot of people in this world.

[00:47:25] **Nate Hagens:** So what are the ecological, effects of this type of saltwater agriculture?

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[00:47:31] **Andrew Millison:** You know, it's interesting because, if you look at the comments on that video, I mean, people kind of slayed the process.

[00:47:40] One of the main comments was, you're absolutely destroying these areas 'cause you're bringing salt water in and you're flooding these zones. But I think that what p people don't realize is that these areas. You know, there's a constant inflow and outflow of water with the tides in these entire regions.

[00:48:00] And these are not areas that were salt free to start with. They were areas that they were, they had attempted to create nons, salty agriculture over time and just kind of destroyed these regions. And they were very like, sort of unproductive agricultural regions. So there is an argument to say, don't touch them, just turn them back into native, you know, salt marsh habitats and, you know.

[00:48:26] Sure. But like, there's also a lot of pressure to produce enough food to feed 8 billion people.

[00:48:34] **Nate Hagens:** Do you feel like your role as a permaculture, evangelist slash filmmaker, basically, even though they're not films as much as they're short, videos is, a really important in a cultural, educational sort of way just to, because there's so many pro future things we can do that people are unaware of.

[00:48:57] They just don't know. So how seriously do you take that, responsibility and, like, what else are you working on?

[00:49:05] **Andrew Millison:** I take it really seriously. Like I see where I've made mistakes. So like in the saltwater video for instance, like there's some things that we really missed explaining and the feedback.

[00:49:19] The comments showed me very clearly, you know, like, okay, we did, so actually since then, we implemented a thing where I have a focus group now, and that when I have a video that's about ready to go, I'll send it to a focus group and I'll be like, so what do you not understand? You know? And just because I, have a hard time knowing what people don't know.

[00:49:42] I mean, like, there's certain things that are just, for me, it's like everybody knows that, all right, there's these basic assumptions, but I can't assume that people

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have, you know, that understand this. So I always need to kind of take a step back. And so a lot of times we will now we show, we so, so I, take it very seriously because, I mean, LA in 2024, I had 35 million views on my channel, right?

[00:50:04] So I mean, that's, a lot of eyes, that's a lot of influence to this collective mind. And I really, you know, want to. First off, just respect my viewers' times by doing my own homework. But also, I wanna portray the excellence of the things that I'm seeing and, and I wanna explain it in a way that it could potentially be replicated.

[00:50:34] So.

[00:50:36] **Nate Hagens:** A lot of the things you've done recently have been international. a lot of the viewers of my program and, maybe yours, are in the United States and, Europe. and for many of those viewers, their most frequent experience, with growing vegetation are grass lawns. Yeah. so can you, discuss your thoughts on that and why there's a growing movement against lawns, and yeah.

[00:51:03] And what are you suggesting in instead?

[00:51:06] **Andrew Millison:** Yeah. Well, I just published a video called Kill Your Lawn and Grow Food, so, okay. I'm not mincing my words about how I feel about, the American landscape. I think in the video, we figured out that there's enough lawns in the United States, the size of Florida.

[00:51:25] The size of the state of Florida is how much lawn we have. People are dumping fertilizer. You're mowing, you are, you know, weeding, spraying, herbicide. I mean, the amount of, if, you look at a really well-maintained lawn, especially when you get down to like, you know, Phoenix, Arizona or something like that, where it's super hot and you know you're growing this green lawn or something all, the time.

[00:51:47] The amount of resources that we're dumping into this little square to recreate. Some sort of fantasy from like Old England or something. I mean, I don't even know what the psychology is to having this little, what the psychology

[00:52:02] **Nate Hagens:** is. I, do know the answer to this. Okay. I read it in an evolutionary biology textbook somewhere.

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[00:52:06] Yeah. That when you come out of your house and there's like green low cut things, there's, nothing that's gonna reach out and grab you like a predator. Like if you had large things that were hiding like bushes and things. Yeah. So there's a little bit of a safety and aesthetic, but I don't think it's worth the ecological, impact.

[00:52:27] So, so what are the alternatives?

[00:52:29] **Andrew Millison:** Food. Gardens, you could put the same amount of resources in as far as fertilizer and maintenance and weeding and all of that. And you could actually be a, you could just be growing vegetable gardens. You could be lessening your bill at the grocery store. You could be growing very nutritious food.

[00:52:49] You could have a connection. And you know, when you're out there gardening, you meet all your neighbors

[00:52:52] **Nate Hagens:** and it improves the soil and it's better for insects. Yeah. And, butterflies and birds and everything. Yeah. So is it just a, a cultural barrier that right now to be in a neighborhood of a hundred houses and everyone has green lawns and you're the first person to kill it and grow food, you look like a, an outcast?

[00:53:14] Yeah. Is that the barrier?

[00:53:15] **Andrew Millison:** Well, I mean, and then there's the HOA. What's that? The homeowners association. So most places there are not, most places I don't really know about if it's most or not, but many places there are regulations about what you can and cannot do in your yard. And I could never live in a place that told me what I could or could not do in my yard.

[00:53:37] But many of those there you have to keep a grass lawn, you know, you can't put too many trees or shrubs in. And what do you have in your yard, Andrew? My yard is like a biodiverse explosion. I. Of fruit trees, food plants, native plants, flowers, I mean, I have a third of an acre here, which is like a typical suburban lot.

[00:54:01] And I mean, I have, I've been here for 15 years and I have a, tremendous amount of food growing here for what it is. And I don't even do a lot of

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maintenance at this point. A lot of it's these permaculture, perennial type systems, berries, artichokes, rhubarb, you know, figs, apples, pears, plums, I mean, just, it's packed in.

[00:54:23] Wow.

[00:54:24] **Nate Hagens:** So you're no longer a weirdo, from your neighbor's perspective, or are you still

[00:54:30] **Andrew Millison:** I specifically moved to somewhere that was full of weirdos because I, didn't wanna be, I was in Prescott, Arizona and I was kind of a weirdo and I was like, I wanna be somewhere where I'm not a weirdo and I can do my thing here.

[00:54:46] So, I mean, I live in Corvallis, Oregon, which is, it's a very, gardeny place because it's Oregon State University, which is an ag school, like people garden like crazy here.

[00:54:57] **Nate Hagens:** So what's the formula? How would you recommend someone listening to this program with a little plot of, grass, get started in transforming it to something a little bit more aligned with permaculture principles and maybe, growing some food as well?

[00:55:12] **Andrew Millison:** Yeah. Well, you're, you'd be very smart. The smart way to do it is to actually, I. Sheet mulch over your grass before you even start anything is to get rid of all the grass by layers of cardboard and wood chips. Or you could bring in soil, but basically smother the grass for a season or two and then start to put in your other plantings.

[00:55:35] I didn't do that and I'm. Still to this day fighting grass in many places because grasses once, you know, once they're sort of unchecked grasses are very vigorous, they're competitive with vegetables, they're competitive with fruit trees. So getting rid of the grass and then starting to put in your perennial infrastructure is what I'd call it.

[00:55:57] So getting in your berry bushes, your fruit trees, you know, getting those long lasting plants in and then establishing your annual garden areas. I mean, it

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depends what kind of maintenance you wanna do. Some people do, you could do the whole thing and not do any annual gardens. Annual gardens, meaning like vegetables or higher maintenance.

[00:56:15] You could do the whole thing in lower maintenance. Perennial crops really depends on how much time you have. You know, for me it's a hobby and I love it.

[00:56:23] **Nate Hagens:** So, If viewers wanna support, or get involved with these bigger projects that you're working on now in the future, like the Great Green Wall or saltwater agriculture, how would they go about doing

[00:56:37] **Andrew Millison:** that?

[00:56:38] Yeah, well, first off, on the videos themselves, we put links to where people could, you know, hopefully support each project. I'm actually, starting, I just filmed my first project. In Hawaii with the sovereign indigenous nation of Hawaii, where I'm actually gonna be doing a call to action within the video for people to support the project directly.

[00:57:02] So that's a new direction that I'm going in. You know, I'm having to make that video outside of Oregon State University because I can't use state funds to raise money for a private organization. You're the Permaculture video, Johnny Appleseed. I'm trying. You know, so ultimately we're, what I'm doing now is I'm actually getting funds from private donors to help me make videos that are going to be fundraising tools for the projects that I am.

[00:57:30] highlighting. So we're, we have the first prototype that we're doing that we're editing right now for that one. Yeah.

[00:57:37] **Nate Hagens:** Well, congratulations. That's really exciting. Thank you. since this is your second time on the podcast, I'm not gonna ask you my usual closing questions. instead I'm starting to ask my repeat guest if there was anything in their work or perspective on the world that's changed since they were first on the show.

[00:57:58] so that was 24 months ago.

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[00:58:01] **Andrew Millison:** Well, 24 months ago. I had not been to Africa at all, and that changed my perspectives in a really big way. But, one of the things that, this guy was talking about the head of, the resilience program in for the World Food Program, Volfi Carucci. One of the things that he said is the scale of the solution needs to match the scale of the problem.

[00:58:25] Having like a person to person grassroots transformation, it's very valuable. But I have actually come all the way around and I'm like, we need some top down solutions here. the United Nations World Food Program. I mean, coming in like, like I was like, just, you know, why does the UN have to be here? That was my question.

[00:58:46] And the answer was, the need is so great. The breakdown is so great that it has surpassed the abilities of these countries and their governments to deal with it. They need outside help to help organize this movement and apply real, like worldwide expertise to solve some of these situations. So I've, I've gone from being more of like a, say a grassroots, you know, like, let's let the flock of people.

[00:59:22] Do this. Like permaculture is very much like one by one. You do your own yard and you know, it's this sort of like people's movement to like, Hey, we really need this from the top down also, because there's a lot of places that solving this problem is beyond their current capacity and it's getting worse.

[00:59:40] **Nate Hagens:** So what's your like grand vision and wishlist if all the stars align, what role could permaculture and media about permaculture along the way play in our, ecological economic, crisis in coming decades?

[00:59:56] **Andrew Millison:** There are so many. Of the great, especially the great ecological problems, but like I said, that lead that are directly tied into social political problems.

[01:00:06] There's so many of the problems in the world that could be solved with these types of permaculture type approaches. You know, we're seeing it on a large scale in Sub-Saharan Africa. partly because the need is so great that it's come to that in a sense. But I mean, I could see similar types of land restoration, climate stabilization projects applied.

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[01:00:34] You know, show me somewhere in the planet that does not have a problem that this, that these solutions could help. You know, so I, I think that, hopefully, my education and, you know, my media work is creating a spark where people are like, wow, you know, for, there's actually really simple solutions to a lot of these problems that are actually not even costly.

[01:00:56] Like, do we know that? Do we realize that a lot of the answers to our problems are really

[01:01:04] **Nate Hagens:** simple? Could you imagine if killing your lawn and putting in a food forest made you cool in the United States? Like, just that one thing and, what would result from it. Yeah. yeah. Yeah. Well, Thank you for the, oxytocin and positive inspiration, for the ecology of Earth and your continued work. Thank you so much. And do you have any closing words for our viewers?

[01:01:33] **Andrew Millison:** Well, I just wanna u thank you Nate, for, you know, continuing to bring this I. these positive messages and also just all the information you do.

[01:01:41] So I appreciate being in the podcast. And, yeah, you can check in on, you know, I actually, I would love if people would just watch the videos we're talking about. It'll get you, give you a lot more depth. Just go to my YouTube channel, Andrew Milli, and, yeah, just, stay tuned because we have, I've got a lot more coming to be continued, my friend.

[01:01:58] Thank you. To be continued. Yeah.

[01:02:00] **Nate Hagens:** Awesome. If you enjoyed or learned from this episode of The Great Simplification, please follow us on your favorite podcast platform. You can also visit the [great simplification.com](https://greatsimplification.com) for references and show notes from today's conversation. And to connect with fellow listeners of this podcast, check out our Discord channel.

[01:02:22] This show is hosted by me, Nate Hagens, edited by No Troublemakers Media, and produced by Misty Stinnett, Leslie Balu, Brady Hayan, and Lizzie Siri.