



## **Journey to Planet Earth**

### **Transcript for Episode 03: Land of Plenty, Land of Want**

**Complete Version**

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**Journey to Planet Earth is produced by**

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(opening montage)

Farming is often about faith. It's about waking each morning and praying that the rains will come -- or that your herd will stay healthy. It's about trying to keep a family together while coping with the frailties of the environment.

This is a program about farmers -- farmers in Zimbabwe, France, China, and the United States. Though separated by distance and culture, they all face the same critical issue: how to feed more and more people without impoverishing the land.

And with views from space our ancestors never could have imagined, we will see that farming is often about unexpected cycles of change. Planet Earth -- this is where our journey of discovery begins.

[Titles]

(Arid Zimbabwe landscape)

In a remote corner of Zimbabwe, in Southern Africa, the rains are late by seven weeks. Watering holes and grasslands are disappearing. Wildlife begin to suffer. Elephants invade farms and pastures in search of food. An unforgiving sun turns hundreds of villages into dusty wastelands.

(The Dzangare farm)

Small family homesteads are especially hard hit. Matias Dzangare and his wife have worked this land all their lives. Its always been a difficult existence. But the lack of rain is causing serious concerns. Food supplies are slowly dwindling. The villagers are in desperate need of help.

(Spirit medium)

Several days later the dryland silence is broken by the prayers of a spirit medium. Cloaked in ceremonial black, Mbuy Chaibhira communicates with her ancestral spirits -- asking for rainfall that will bring life to the barren soil. What she doesn't know is that an unusually strong El Nino event has put her country on the brink of disaster.

(El Nino Visualization)

Remote sensing instruments high over the Pacific Ocean, analyze the developing weather phenomenon. Abnormally high sea-surface temperatures are indicated by the intense red color. Scientists issue an El Nino alert. For some it means torrential rains.

(parched land)

In Zimbabwe, it could mean a severe drought. Without rain, 13 million people face a possible famine. It's not a new phenomenon. Struggling with a harsh environment has always been part of this nation's history.

(Great Zimbabwe)

Shrouded in the morning mist lie the ruins of southern Africa's largest medieval city. Called Great Zimbabwe, it was founded in the 13th century. Over the next three hundred years it's population grew to over 16,000.

And at its center -- a royal palace. Where once Kings and high priests walked, all that remain are massive walls and broken ramparts. Abandoned in the early 1500's, this is the largest ancient structure in sub-Saharan Africa.

Recent studies have revealed that its growing population depleted pastures, and water supplies. Great Zimbabwe was deserted because it became unsustainable. It's a vivid reminder of just how vulnerable the land is to human pressures.

(Harare)

Rising out of the rugged African landscape is a present-day Great Zimbabwe. Harare is the nation's capital -- its heartbeat.

(Downtown)

Once a small colonial trading post, it is now a thriving modern city; home to over one and a half million people.

(Busy Streets)

Harare is a symbol of promise -- a magnet drawing people from the country's rural areas. Each year, tens of thousands pour into the city seeking a better way of life.

But very much like Great Zimbabwe, Harare gives off mixed signals. Once, many of these people stayed on the land -- attached to it by inclination and heritage.

Their alienation from the land traces back to the mid 19th century when the British first dominated the territory they called Rhodesia.

(Archival Photographs)

At first, the colonialists burned storage bins to control the supply of food. Indigenous crops like millet and sorghum were replaced by western crops -- corn, cotton and tobacco. To increase productivity, fertilizers and pesticides were introduced. Then the colonialists virtually enslaved the people and banned most forms of indigenous agriculture.

(color close-up)

Ultimately Zimbabwe won its independence, but not before a century of colonialism altered the very nature of farming.

(drought)

The drought has entered its second month. Temperatures soar to over 110 degrees Fahrenheit. Cattle wander aimlessly through villages and over-grazed fields.

(Commercial farms)

The lack of rain generates little desperation for the farmers of Zimbabwe's mostly white-owned large commercial farms. Their fields flow with water -- pumped in from private reservoirs and underground aquifers.

Owned by just 5,000 families, their farms sit on 80% of the nation's most fertile soil. This legacy of colonialism is compounded by the fact that much of their harvest is for export. During a famine tobacco and cotton won't feed a hungry nation.

(The Dzangare farm)

Small scale farmers live in a completely different world. Matias Dzangare spends more and more time with his grandchildren. Though some sense the impending danger, most of the children are unaware of the family's marginal existence. They rarely see their fathers who have been forced to move to urban centers in search of work. Leaving behind wives and children is not uncommon in Zimbabwe.

Despite the lack of rain, Matias' oldest grandchildren practice the skills they so badly need to become farmers. They've already experienced the consequences of a famine.

All Matias can do is hope that the spirit medium's prayers are answered. Fortunately others are taking the battle for survival into their own hands.

(Reservoir)

They include an elementary school principal who decided to build a dam.

**David Jura**

*I built this one physically myself using these hands -- very tough. It all began in 1992 in April until 1995 on the fourteenth of December. That's when I put on finishing touches of this wall. It was pretty tough. So we are going to use this water here for irrigation -- for the communal people. They will benefit.*

(singing groups)

By providing local farmers with a reliable source of water, David Jura's dam has bettered the lives of thousands of people.

In Zimbabwe, singing has always been a way of bonding, a joining together of those who work together. Their voices can be heard in villages throughout the countryside. Singing is also a way to share in the joy of the harvest and the small miracles that come with water.

The women of Chinamora have tended a communal farm for ten years. In the past, they used chemicals which were often banned in richer more developed countries. Without protective clothing, they frequently suffered the toxic effects of these substances.

But now that they have been empowered by a reliable source of water -- they are beginning to also cast off the shackles of colonial rule.

(Lab)

They are guided by a scientist who works with local farmers.

**Sam Page**

*We're able to show that you can grow vegetables without using pesticides. After the initial training and follow-up of a year with our farmers in Chinamora they are now able to grow vegetables without chemicals and they are being supplied as organic produce in the local supermarket in Harare. I think these farmers are going to be very successful -- they're very highly motivated.*

Today, the farmers of Chinamora use less chemicals and are planting indigenous, drought resistant crops. In just two years their bounty has almost tripled.

(another farm)

The ability of a community to feed itself, to reach its full agricultural potential, has many other tangible benefits.

Timothy Madhende was about to leave behind his wife and child and seek work in Harare. He now earns enough to stay in Chinamora -- and his son will grow-up knowing his father.

(arid farm)

Others are not doing as well. The drought has entered it's third month.

(computer visualization)

High over Africa, satellites send back time-lapse photographs. They show dramatic loss of vegetation -- especially in southern Africa. With the height of the growing season only six weeks away, Zimbabwe's communal farms are slowly turning brown.

(The Dzangare farm)

When the rains finally come -- they are six months late. Matias Dzangare's crop is meager. It will barely see him through another season. Yet he is secure with the knowledge that change is coming to Zimbabwe and that his grandchildren will learn better ways to farm their homestead.

(village life)

With a patience forged by the rhythms of an ancient landscape, Zimbabwe's communal farmers continue their struggle against poverty. They are not unlike most other farmers throughout the world. They live on a thin edge -- an edge sharpened by poor harvests and drought.

(opening scenics)

Five thousand miles and a world away from Zimbabwe, medieval fortresses and long dormant volcanoes dominate the landscape of the Auvergne region of central France.

This is a world of memories and picture postcards -- of ancient stone villages surrounded by gently rolling hills.

Like the farmers of Zimbabwe, those that work this land live on a very thin edge.

(birth of lamb)

Alain Fialip is trying to bring a new life into the world. It's not an easy birth. The mother has just died. Alain has been through this before -- many times. With a little coaxing the lamb begins to breathe.

The crisis is not yet over. Alain and his wife Christiane know their orphaned lambs will die unless other ewes allow them to nurse. Their efforts aren't always successful. Today they share a rare moment of supreme satisfaction.

But most of the time Alain is not very optimistic about the future. For over two hundred years this ninety acre farm has supported generations of his ancestors. Today, it can barely support a family of five.

**Alain Fialip**

*We live on difficult land. Our agriculture is relatively poor due to the soil. The climate is not good and our growing season is shorter because of our high altitude. We have six months of winter.*

(Alain working)

Alain's major problem is that cattle and sheep ranching in Auvergne are too expensive. A declining local population means there is less demand for his goods -- and a costly transportation system makes it very difficult to compete against European market prices. This, coupled with a harsh climate, is at times overwhelming.

(working in office)

**Alain Fialip**

*Allo Francois, bonjour.*

But Alain continues to explore ways to cut costs while still maintaining the high quality of his products. Anything to keep from being driven off the land.

(working on tractor)

Despite all his efforts, deep down he knows he can't compete against large highly mechanized corporate farms. In just one generation almost two million French citizens have abandoned their homesteads. Alain struggles on.

(Alain surrounded by sheep)

He has little desire to expand, only the fervent wish to prolong a time honored agricultural tradition. But in Auvergne, a way of life, developed over centuries, is collapsing.

(Gilbert loading sheep on truck)

Gilbert Bros is a sheep farmer -- his roots also reach deep into the rugged soil of Auvergne. But unlike his neighbor, Gilbert no longer spends most of his time working the land.

(Gilbert Bros at market)

He is second in command of France's largest farmers' union. His job is to keep in touch with the farmers of Auvergne. He hears their stories and tries to solve their problems.

(Union meeting)

And when he's heard enough he puts on a tie and tries diplomacy. And if that fails, he is forced to resort to more aggressive tactics that often make the evening news.

(TV news report)

With Gilbert leading the way, 10,000 angry protesters recently dumped thousands of gallons of milk to dramatize their fierce resistance to free trade. They also demanded higher subsidies to supplement their incomes.

This act of desperation by local farmers was their response to an invasion of low-cost imports that placed them at a competitive disadvantage.

**Gilbert Bros**

*We use demonstrations to make our voice and our opinions heard. Demonstrating usually gets us results because often public opinion is on the side of the farmer.*

*(v.o.)*

*All we want is a decent wage and still be able to produce good quality products. But most important, if we can afford to stay small, more people will stay on the land and our region will prosper.*

Often Gilbert is torn between his belief in a bright future and what he sees when he brings his sheep to market.

(Sheep auction)

Each week farmers gather at the local sheep auction. Today the prices are high. Business is brisk. But take a closer look at these people, particularly their faces. These are not the faces of tomorrow's farmers. These are the faces of the past -- the faces of yesterday.

(Ghost Town)

Many of the villages that Gilbert Bros holds so dear are becoming ghost towns -- a testament to rural flight. A century ago, twice as many people lived in this remote part of France. Not very long ago this high school was home to over a hundred students. Today there are only fifteen. When a school closes a village dies.

(closing montage)

The relentless movement off the family farms of Auvergne is hardly unique. It's happening in Zimbabwe -- it's happening all over the world. This shift in population not only strains the livelihoods of those staying, but affects the places where many of the people have fled --

(Brittany Coast)

-- like the Northwest corner of France -- where farmers have their own set of problems. To understand these issues, its important to first understand Brittany's connection to the sea.

This is a region of strong ocean currents and tidal changes. Sometimes at low tide the sea almost disappears from view -- only to come back hours later joined by the returning fishing fleets.

(Fishing Fleet)

Instead of farmers, Brittany has always spawned men of the sea. Not very long ago they left behind a generation of widows when their frail sailing boats ranged as far as Iceland. The perils of the sea have made the Bretons a deeply religious people.

(church)

In nearly every fishing village there are chapels to honor the men who lost at sea.

Along their walls are slabs of stone and wood and on each is a name and they all have one thing in common. This is the "wall of the disappeared" and the names are of the men who sailed away and never came back.

(Fish unloading)

After a night of trawling the Atlantic waters, the fishermen of Guilvinec prepare for the daily auction. In the past decade, Brittany's fishing community has dwindled from 60,000 to about 20,000. In a sense their names are also candidates for the wall of the disappeared.

(fish auction)

Over-fishing and pollution have devastated the local waters -- like the farmers of Auvergne, inexpensive imports have forced down prices -- driving many into bankruptcy. As a result, most of the region's young people have started new lives -- as farmers.

(villages surround farms)

The inland villages of Brittany are astonishingly beautiful. Twenty years ago they were bordered by forests and wetlands teeming with wildlife. Today they are surrounded by cultivated farmland.

(intensive farming)

This is the nation's most intensive agricultural area. Almost every available acre is under cultivation. Unlike the farmers of Auvergne, Bretons use an extraordinary amount of chemicals. The result is a significant increase in yields which has helped France become Europe's leading exporter of agricultural products.

(Farming near Sea)

In an effort to exploit every inch of arable ground, the land is farmed to the water's edge. Ironically, agricultural run-off has so polluted Brittany's rivers and coastal waters that it is partially responsible for the collapse of the local fisheries.

(Pig farm)

Compounding the problem is the amount of waste produced by animal farming. Didier Bienne's state-of-the-art farm, houses over 1500 hogs. It's just one of the thousands of such facilities that make Brittany France's largest producer of pork.

(Chicken farm)

Poultry is also big business in Brittany. Unfortunately, concentrations of chicken and pig farms produce enormous amounts of toxic waste which too often spill into already contaminated aquifers and streams.

(Thierry Merret's farm)

No one questions that livelihoods in Brittany depend on agricultural production. The real question is, how to strike a balance between preserving the environment and safeguarding the region's economy?

Thierry Merret has found a way. His lettuce farm is the largest in this part of France. Yet, he has still managed to protect the surrounding waterways.

**Thierry Merret**

*We can produce with less chemicals. I produce cheaper but it's also good for the soil, it's also good for the air and good for the water.*

(closing montage)

The farmers of Brittany are beginning to realize that they must resolve a fundamental issue -- the conflict between those that want to increase production and those who want to protect the environment. Nowhere is this struggle more evident than in China --

(China - faces)

-- the world's most populated country -- the awakening economic giant of Asia.

(Shanghai waterfront)

Emerging from an early morning haze is Shanghai -- one of China's largest cities.

It's a modern, sprawling, riverside metropolis,

(Fan dancing on the Bund)

-- where some still cling to the customs of long ago dynasties. Shanghai is a place where past and future intersect.

(streets)

Over 15 million people choke its streets. Once a modest fishing village, today Shanghai is on the verge of becoming the commercial and financial center of Asia -- if not the world.

Despite all its possessions -- all its riches -- not so very long ago these food stalls were empty -- the threat of starvation a daily fact of life. Though many are too young to remember, others cannot forget the horrors of a once well kept secret.

(b/w footage)

The year is 1962. Angry protesters disrupt the country -- misguided political decisions bring agriculture to a grinding halt -- famine claims a staggering 30 million lives.

(food market)

Today the nightmare of extreme hunger is long gone. Shanghai's markets overflow with fresh produce and once unimaginable luxuries like milk, eggs, and beef. In a sense the abundance of food is both a monument to the country's economic boom and a preview of China in the 21st century.

(Canal)

The story of China's agricultural success could very well begin here. Suzhou Creek cuts through the heart of Shanghai. Each day over 2000 barges bring in supplies to sustain a growing and hungry city. It's part of a network of canals that is a lifeline to another world -- to an ancient countryside that seems frozen in time.

(countryside)

Yet it is here, in this seemingly unremarkable place, that a surprising agricultural drama is unfolding.

(farming)

The Yangtze River Delta contains China's most fertile soil. On this flat, watery landscape, not far from Shanghai, every available acre of land is under cultivation. The results are remarkable. Since the end of the Cultural Revolution per person food consumption in China has risen by almost 50%. In a country of over a billion and a quarter people, very few go hungry. Like the farms of Brittany, the land is intensely cultivated. Except here in the delta the yield is two and sometimes three harvests per year.

But in return for this fruitful bounty, land and water resources are beginning to suffer. It's not an easy trade-off -- it never is.

(rice harvest)

About a dozen people work this small state-owned rice farm. The harvest is over. They are gathering stalks for use as organic fertilizer. Their labor is hard -- the hours long and back breaking. There are no tractors, combines, or thrashers here -- almost everything is done by hand. Yet these hard working people are a part of a true agricultural miracle. A miracle that feeds 22% of the planet's population with only 7% of the world's arable land.

(canal)

Deeper into the Yangtze River Delta fish begin to rival rice as the dominant crop.

(pulling in fish)

The villagers of Qing Pu are also finishing their harvest. Fifty ponds -- holding five different species -- produce 29,000 tons of fish each year.

(Fishing village)

Qing Pu is not unlike tens of thousands of fish farms all over the country. With the harvest completed, the villagers will spend the next few months cleaning their boats and mending their nets and traps.

(draining ponds)

They also drain their ponds to repair any damage. Their biggest fear is that toxic water will seep into these man-made lagoons. More than half of China's rivers and lakes are seriously contaminated from industrial waste and agricultural run-off.

Yet the villagers of Qing Pu are secure with the knowledge that their livelihood is assured because the local government decided to protect the quality of their water. Agricultural and industrial development is

not permitted within five miles of their ponds. It seems like such a logical law. But other less fortunate villages in the Yangtze River Delta have no such regulation.

(Farming near industry)

Thousands of arable acres are being destroyed in the name of progress. Ironically, China's most threatening agricultural problem is its booming industrial growth. Each year China loses about one million acres of farmland to new factories and real estate development. In the past 40 years China's farms have lost a third of their most fertile land -- forcing farmers to work the remaining soil even more intensively and increasing the risk of environmental damage.

Each day barges carry the harvests of the Yangtze River Delta to Shanghai. They return loaded with construction materials. Unquestionably, China has chosen industrial growth over agricultural production.

Less than a decade ago these streets were surrounded by fertile farmland. They are now home to dozens of small and medium-sized industrial enterprises. This small plot of land was once a rice farm.

(interior of factory)

Instead of 3 tons of rice, the yearly harvest is 120,000 pairs of trousers. Almost every worker was lured off the farm. Farming skills, honed year after year, are disappearing along with China's most productive land. Yang Jia harvested rice since she was a child. Three years ago she left the land to make more money in this garment factory.

(village)

Today, her ancestral village is practically deserted. Only a few farmers and the elderly remain. Yang Jia's grandmother finds it hard to adjust. She doesn't quite understand why most of the younger people have moved to the city instead of working in the rice fields. Like most of China's older generation, the villagers do not greet each other with the Western phrase, "How are you?" Instead, the greeting is, "Have you eaten today?"

Clearly the famine of the early 1960s is still a profound and disturbing memory.

(closing montage)

That most are now well-fed is an extraordinary achievement. But losing over a million acres of farmland each year means farmers have to be even more productive. If they fail, massive amounts of food will have to be imported. It's a possibility that's already having a major impact around the world --

(Iowa night harvest)

-- even on the lives of the farmers bound to the rich, black soil of Iowa. Here on the edge of the Great Plains, during the harvest the time of day is meaningless.

(day harvest)

Joe and Bill Horan are in the middle of an around the clock forty day sprint -- a race against time to bring in their corn and soybeans before the weather turns. An early frost or hail storm could ruin their entire crop.

Joe works in air conditioned comfort at a steady six miles an hour. His brother Bill maintains the pace, receiving the grain that will eventually be trucked to nearby storage silos.

Their farm is about as far from China as you can get. Yet almost half their harvest will make its way to the burgeoning markets of Asia.

**Bill Horan**

*Basically, a farm in the Midwest is a protein factory, and the whole idea is to produce as much protein per acre as we possibly can to feed the United States and the rest of the world.*

From late September through early November Iowa's annual cycle of harvest never seems to end. The continuous demand for food is at the heart of a major environmental dilemma -- in the process of helping to feed the world are we in danger of depleting the soil of our nation's heartland?

(aerials)

At first glance, northern Iowa is a vision of agricultural stability -- row upon row of corn and soybeans stretch endlessly toward the horizon. The rich black earth of these farms, the earth that nurtures their crops, is actually a gift left behind from the last Ice Age.

(glaciers)

Ten thousand years ago nearly a third of Iowa was covered with glaciers.

Over time, the climate changed -- temperatures rose -- and the ice slowly began to retreat. Left behind was some of the youngest and most fertile soil in the country.

(tallgrass prairie)

The history of the tallgrass prairies is legendary -- a place where the natural interaction of wild fires and grazing herds of buffalo enriched and replenished the soil -- renewed each year into an exquisitely balanced eco-system.

(pioneers)

With the coming of the pioneers, native grasses were ripped apart. In less than a hundred years the tallgrass prairies were transformed into America's corn belt. By the end of world war I it was becoming the breadbasket of the nation. In haste to reap the rewards of this naturally fertile soil, farmers worked the land hard. It was left unprotected and vulnerable to the elements. Then a prolonged drought hit the mid-west. What followed was the country's worst environmental disaster.

(dust bowls)

The dust bowls of the 1930s started when the seasonal winds began to blow, creating massive dust storms. Thousands of farmers packed up and fled westward. Bill and Joe Horan's father tried to dig out, but eventually he gave up and left Nebraska and started over in Iowa.

**Jim Horan**

*I don't know how we existed through those years. I guess we didn't know much about anything else out there then. There was no money, what would we do? Where would we go?*

(Horan farm)

Joe and Bill Horan are corn-belt farmers of the new millennium. Like the early pioneers they grow similar crops, work similar land, worry about the same uncertainties of weather. What separates them from previous generations, however, is technology.

**Bill Horan**

*It's kind of frightening the speed that things are changing these days. We went from a generation ago with my grandfather harvesting a hundred bushels a day by hand with a team of horses and having a feeling like he had a really good day to where my brother and I now can harvest routinely 25,000 bushels. It isn't because we work any harder, it's because of the technology that we have available and the machinery we have available today."*

(deserted farm house)

There are no longer teams of plow-horses in Iowa. Like the small villages of France, left behind are the skeletons from another time -- another era.

Quiet reminders that the mechanization of agriculture means fewer people are needed to farm larger tracts of land. At the turn of the 20th century farmers were nearly 35% of the population. Today, fewer than 2% of American families work the land.

(combine)

But there is technology -- and it is rapidly changing the face of agriculture.

(satellite images)

High above, a network of military satellites scan the landscape -- not to pinpoint targets, but to tell farmers their exact position. Coupled with yield information from previous years, farmers can now manage their land by the square foot instead of by the acre.

(inside combine)

Joe Horan's on-board computer is linked to the satellites above. Called precision farming, he now knows exactly when and where to apply chemicals.

**Joe Horan**

*Since the government has loosened up a little bit on some of the global positioning equipment that they've had, we have gone to a more of a site specific management system. We apply fertilizer and herbicides where needed, as needed. We live here. Our kids live here. We drink the water. We breathe the air. We try and be as good a steward of the soil as we can.*

(labs)

Elsewhere in Iowa space age laboratories dot the landscape. Here, research scientists create their own weather conditions. They are developing new high yielding seeds that are drought resistant and require less chemicals. It could have an enormous impact around the world -- especially in places like Zimbabwe.

**Jim Keshaw**

*We test products across many, many different kinds of environments. We like to expose our varieties and hybrids to drought, to heavy disease pressure, to heavy insect pressure, to heavy rains. We want them to be stable enough to handle almost any kind of weather that it can be exposed to.*

As night slowly turns into day, the Horan brothers continue their race to bring in the harvest. They are a new breed of farmers who try to increase yields by experimenting with the latest advances in technology. It's an admirable goal and for now it seems to be working.

Yet, there are other places where people work the land according to a different set of practices.

(Sunrise in Pennsylvania)

Lancaster County, Pennsylvania is such a place. Here sunrise usually signals the start of the work day.

(kitchen)

Steve and Elias Groff's day begins with a leisurely cup of coffee.

**Elias Groff**

*So, what I need today is at least 15 boxes of plum tomatoes.*

It's a quiet moment in their busy schedules. A time to discuss the day's activities.

**Elias Groff**

*Getting the tomatoes loaded?*

**Steve Groff**

*Yeah, I'm good. I want to load up all the processing tomatoes. Well it sounds like we have three good days here, so I think I'm going to finish cutting the...*

Fifth and sixth generation Mennonite farmers, Steve and his father are deeply attached to the land.

(farms)

Their 175 acre vegetable farm is located in the gently rolling hills of southern Pennsylvania.

Lancaster County is a community grounded in a strong work ethic dating back more than 250 years -- to the time when Amish and Mennonite immigrants came from Europe in search of religious freedom.

Their way of life has changed very little over the years. The more orthodox Amish cling to a life-style abandoned by the modern world. They do not drive cars and use mules and horses to pull their plows. The more liberal Mennonites rely on more contemporary means of transportation. Both see themselves as the custodians of one of the most productive non-irrigated counties in the United States.

(plowing & rain)

But, reminiscent of the dust bowl days, their precious land is continually exposed to the elements. Each year more than four million tons of Lancaster County's richest earth are washed away into nearby streams and rivers.

Most of the loss takes place during severe rainstorms. It's not uncommon for an inch of rain to fall in less than thirty minutes. The damage on most farms is both dramatic and costly.

(Aerials)

Once, these farms averaged sixteen inches of the best topsoil in the world. Now, it's barely eight inches. The rest lies somewhere on the bottom of the Susquehanna River or the Chesapeake Bay.

(rolling & seeding)

The devastating cycle of topsoil loss does not exist on the Groff farm. When Steve joined the family business, he brought dramatic change. Instead of plowing the land, each fall he plants a cover crop that is rolled onto the land to form a protective carpet.

**Steve Groff**

*Some of my fields have not been tilled in any fashion for about 15 years. The reason I got away from plowing the soil was because I saw too much soil erosion. My soil was washing away when we had rain and since soil is my number one asset, I want to try to manage it in such a way to keep my soil in place.*

Called no-till farming, Steve never exposes the soil to the elements.

(seeding)

In the final step of the process, a specially designed tractor places the seeds for the vegetable crops directly into this natural mulch. The soil is never turned up. Several months later the land is ready to be harvested.

(Harvesting )

This is when Steve Groff's faith in no-till farming is justified. When his grandfather started farming tomatoes on this land, the yield was 15 tons to the acre. Today the farm's tomato yield is 40 tons per acre and equally important, soil erosion has been cut by over 90%.

**Steve Groff**

*The other thing that the cover crops have done for us is being able to reduce our insecticides and our fungicides in our vegetable crops. We've done some testing comparing the conventional versus no-till tomatoes, and on our farm where we've got about a 10 percent yield increase. And we've been able to consistently get increased yields ever since we've been able to do this.*

In a very real sense the Groff's no-till farm is an island of sustainable agriculture in a sea of doubters. Convincing Steve's father was no easy task.

(Elias Groff loading truck)

Elias is a practical man who handles marketing for the farm. At first he was skeptical about no-till.

**Elias Groff**

*When our son Steve had talked about coming along with no-tilling, I thought that -- I don't see how it's possible.*

Elias is completely won over. He sees their yields rise even in the dry years. He sees the benefits of using less chemicals. And he sees that it can be profitable.

(market)

Several times a week Elias brings his produce to a local market. Today, as on most days, he does well at the auction. It's a validation not only of his son's no-till farming but of a family's persistence.

**Steve**

*I'm the third generation on this farm and I'm really proud of that, to be able to continue on the tradition of agriculture that has been in our family. And my mission or my goal in life, in regards to farming, is to be able to leave the soil in better condition than when I found it.*

(closing montage)

There are no global views on the minds of these Pennsylvania farmers. No overseas markets for their produce. Yet, how they meet their economic needs while respecting their deeply held environmental beliefs speaks volumes to people all over the world.

It speaks directly to the women of Chinamora who have learned to harvest their tomatoes without upsetting the delicate balance of their soil.

It has much to say to David Jura and all those who help break the cycle of poverty and hunger.

There are no easy answers or quick solutions but there are ways to strike a balance between what we want and what nature can provide.

Brittany is beginning to understand the limitations of its soil -- and the people of Auvergne continue to fight to preserve their rural way of life.

In China, farmers are beginning to realize that they must explore new ways to cope with the loss of irreplaceable farmland.

And the farmers of Iowa continue to seek high tech solutions to increase their yields.

But in the end, for the people who work the land, who draw sustenance from the soil -- there are common bonds -- bonds that are renewed by each generation -- bringing new ideas -- new attitudes -- new hope.

Planet Earth. This is our home -- this is where our journey of discovery must begin.

[Tail Titles]

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