



Solutions From the Land

Revolutions in Resilience: ...A Unifying Vision for 21st Century Agriculture

GACSA Annual Forum
Hilton Bonn Hotel...
Bonn, Germany
June 15, 2019

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My farming neighbor told me he may retire this year...he'll be 94 years old. He was born in 1925. In 1927 the global census estimated that there were 2 billion people on the planet. Today there are 7.8 billion. The quadrupling of the global population could have only happened because agriculture has evolved to be predictably productive and capable of creating enough abundance to consistently feed the world's inhabitants and their domesticated animals and pets. In the 1920's, for the first time in human history more people lived in cities than in rural regions. And with the steady decline of people engaged in the endeavor of agriculture...the layers of understanding and support for those who produce food & fiber has declined as well.



When Ag has no vision...the Disconnect: The creation of abundance allows for the expansion of the global population. A world of scarcity (of water, food or energy) puts us in a state of survival. We know this but with long periods of abundance comes complacency, ignorance...leading to an indulgence where people feel entitled to criticize those basic categories of human need. The luxury of abundance allows for the current diatribe against agriculture and the notion that the food system is broken. In a world of multiple choices for food, water and energy...the tendency to let preferences drive opinions that drive policy and politics starts us down an alarming and challenging slippery slope. If ignorance is bliss, than the populations of our country must be ecstatic within their bubble of abundance.

“The policies and practices of the past will not meet the needs of tomorrow”



...but understanding the past has never been more important!



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A generation ago, we began to see the results and benefits that come from unrestricted access to a global knowledge base.

Who knows these 3 Scientists? All of them worried about a world in crisis...all looking at the world through a different lens. All of them convinced that their life work will help save the world for future populations. The Father of Conservation (Hugh Hammond Bennett), The Mother of the Environmental Movement (Rachel Carson), the Father of Modern Agriculture (Norman Borlaug).



In October of 2015, the UN announced the Sustainable Development Goals providing us with a destination for humanity by the year 2030. Each one of these ambitious goals can be aligned to match our human endeavors in agriculture. In fact, as you read through these goals and imagine a remarkable new world...you will quickly observe that these goals in their totality can not be attained if agriculture is doing poorly. And that is where the Renaissance of agriculture must be broadly understood and anticipated!

Goal #17*	<i>Strengthen the means of implementation and revitalize the global partnership for sustainable development</i>
Goal #15*	<i>Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss</i>
Goal #6*	<i>Ensure availability and sustainable management of water and sanitation for all</i>
Goal #7*	<i>Ensure access to affordable, reliable, sustainable and modern energy for all</i>
Goal #9*	<i>Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation</i>
Goal #14*	<i>Conserve and sustainably use the oceans, seas and marine resources for sustainable development</i>
Goal #11*	<i>Make cities and human settlements inclusive, safe, resilient and sustainable</i>
Goal #13*	<i>Take urgent action to combat climate change and its impacts</i>
Goal #12*	<i>Ensure sustainable consumption and production patterns</i>
Goal #2*	<i>End hunger, achieve food security and improved nutrition and promote sustainable agriculture</i>
Goal #4	<i>Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all</i>
Goal #5*	<i>Achieve gender equality and empower all women and girls</i>
Goal #3	<i>Ensure healthy lives and promote well-being for all at all ages</i>
Goal #16	<i>Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels</i>
Goal #1	<i>End poverty in all its forms everywhere</i>
Goal #8	<i>Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all</i>
Goal #10	<i>Reduce inequality within and among countries</i>

As you read the 17 Sustainable Development Goals...it becomes clear that the goals cannot be fully achieved without agriculture doing well. In fact, looking at these ambitious but fully plausible goals, it becomes clear that each of the individual goals require us to acknowledge that they are interdependent...they feed on each other...that they require collaboration among diverse stakeholders...and that there is a kind of practical logic one might take into consideration, when strategically thinking how to accomplish these goals by 2030. As a farmer I look at the task of preparing a field for planting, growing and then harvest...there is a logical and methodical step by step process that we use, each step building upon the 'ground work' for success. I took the liberty of reorganizing the order of the goals by making an observation that certain goals need to be in place before the other goals can be accomplished...and sustained...



Goal #17: Strengthen the means of implementation and revitalize the global partnership for sustainable development. Without imagination our vision of what's possible cannot be brought into reality. When we recognize that a global partnership cannot be perfect in every way...but can strive for perfection...that is where our combined efforts to revitalize our planet and implement the SDG's becomes possible, tangible...our new reality. The story of Butchart Gardens in Victoria, British Columbia is the story of transformation after devastation...a showcase of the art and science of agriculture coming back...almost full circle.



Goal #15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss:

By definition agriculture, the cultivation of the soil requires us to disrupt the natural environment in one way or another. Agriculture can be described as the management (or manipulation) of life systems, and the sustainable use of resources to produce food, fiber and energy. The Incas were pretty good at it...and evidently humans have been working with Goal #15 for 30,000 years. The foot print of humanity has been a disruptive endeavor...



Goal #6: Ensure availability and sustainable management of water and sanitation for all

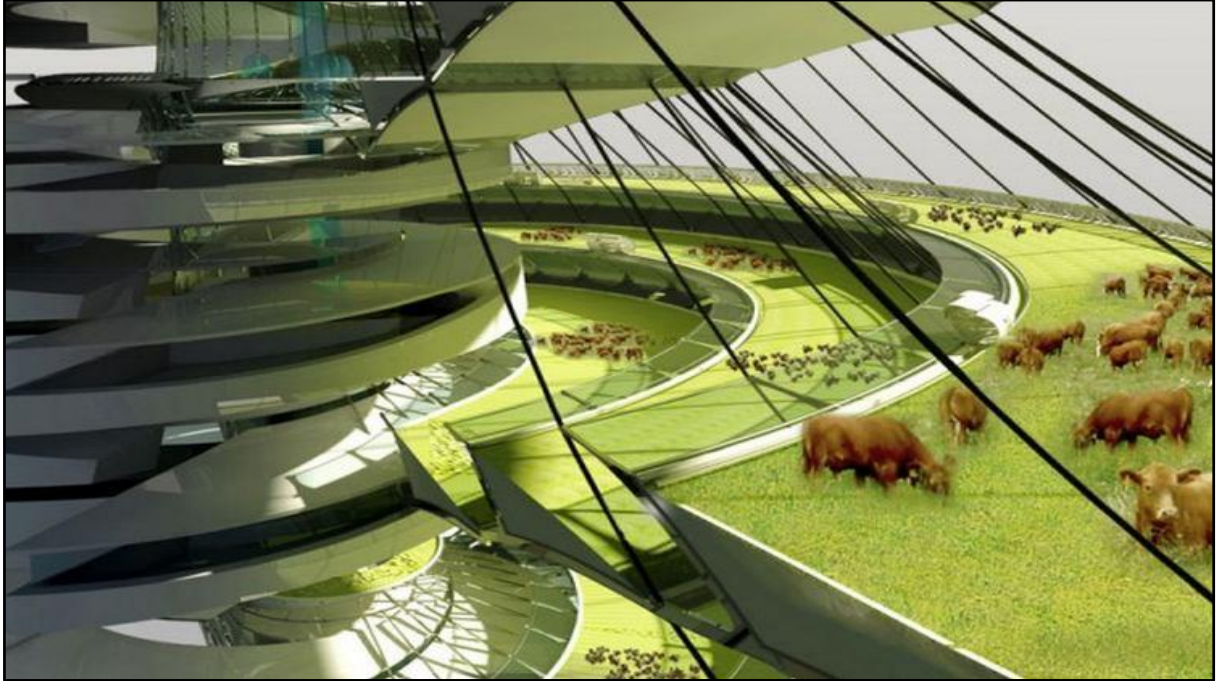
Ironically, this winter as we have already seen some record rainfall amounts, I lost my first planting of green beans to 3-4 inch rainstorm that was supposed to be $\frac{3}{4}$ inch. My co-chair Fred Yoder in Ohio lost much of his first planting of corn last week to a 5 inch storm in 4 hours...his fields were under water. If it wasn't for his new varieties of corn and soy much of his crop for 2019 would have been lost. How many farmers around the world know the pain of losing a crop to flooding or drought...just as they were preparing to plant or harvest?

There's a lot of water on this planet of ours...it's everywhere...in our oceans, falling as rain, in the atmosphere as humidity...and in most cities, it's the resource we use to flush our toilets and wash with. We know that in many ways we have a salt problem, not a water problem and that the goal of affordable ocean or brackish water desalination and mineral reuse holds great promise when we link it to low cost renewable energy sources. And yet if we don't sustainably manage the water we use we can expect significant problems. In the case of irrigated agriculture we know that: No water, no food...No food, no security!



Goal #7: Ensure access to affordable, reliable, sustainable and modern energy for all

We now have wind farms and solar farms... to add to our dedicated crops for biofuels. So not only are we producing high quality biofuels from dedicated crops, the word “waste” in agriculture is very quickly becoming obsolete as everything from manure to tree trimmings is being converted to re-purposed products for us to use. As we embrace the nexus of energy, water and food...it allows us to deliver the net benefits for a planet with 9+ billion inhabitants. We have a vision for agriculture where our imagination, fused together with innovative thinking lets us look at our world with an exciting new focus.



Goal #9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

With new and old thinking, what you thought was impossible becomes...feasible! And what we think is feasible becomes a reality much faster than ever before. Our world is suddenly transformed. We must embrace these new opportunities to improve upon the agricultural food systems that already exist...while expanding our horizons with new innovations and new thinking.



Goal #14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

The vast regions of our planet covered by water and teeming with life are not barriers or obstacles for humanity but a future habitat and of course...a critical resource, brimming with dynamic life systems. Understanding, caring for and managing for ocean related harvests and use is one of the clear priorities for our survival. Some of the most stable environments on the planet are arguably under the oceans...and will provide incredible opportunities for aquaculture.



In the Chesapeake Bay innovative oyster farms are creating cleaner water, locally sourced protein and economic impact...



Our ability to sustainably utilize our oceans and waterways are among some of the highest priorities and opportunity areas...



Goal #11: Make cities and human settlements inclusive, safe, resilient and sustainable

There is a term called “Permaculture” that embraces a concept that we saw in the movie Mars. We are once again learning to become self-sufficient and develop an off grid mentality that allows us to begin to imagine communities that are designed around the concepts of self-independence in the nexus of food, water and energy. Edible landscapes can be introduced throughout urban and peri-urban communities...



The nexus between water, energy, food and new technology will continue to deliver new ways of thinking where we will find that the net benefits translate to a $1+1 = 3$ kind of dynamic.



Goal #11: Make cities and human settlements inclusive, safe, resilient and sustainable...

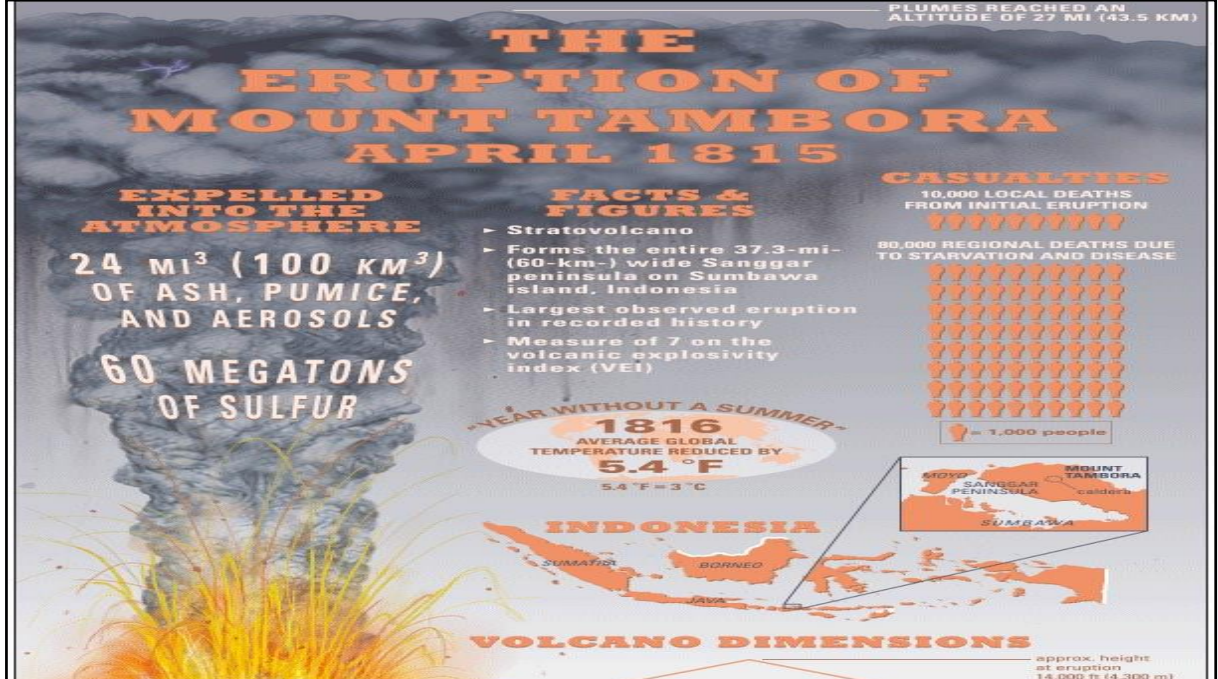
The enormous amount of urban, rural and government owned open space resources that are underutilized, stranded assets that can be repurposed and re-engaged as productive components of an exciting food system framework...a framework that does not replace but augments the systems and supply lines that we depend on day after day.



What we once thought was impossible has moved to feasible...and what is feasible becomes reality so much faster than ever before. So why not embrace the challenge of accomplishing the SDG's in our lifetime? This former abandoned golf course has now been transformed into a strawberry field...if we can imagine it...it must be possible!



This agricultural renaissance taking place across the world is strengthening the backbone of our international food system. We need to be inventing and investing in systems of abundance, not strategies for scarcity. All of these diverse kinds of farming and ranching help to make a more reliable and resilient food supply. No... agriculture is not broken, as some critics would have you believe...in fact it has never been more dynamic! Agriculture must improve with each season, with each generation.



Goal #13: Take urgent action to combat climate change and its impacts

Understanding the past and present...to better prepare for our agricultural future is where we must align our thinking and efforts. In many agricultural circles around my country there is a deep distrust about the causes of climate change and the consequent attack on fossil fuels. But most farmers can understand and agree that changing climate patterns and unpredictable weather means unpredictable harvest. In 1816, Thomas Jefferson wrote in his journals about the summer that never arrived. How fascinating it is today that we understand that catastrophic seismic events, aberrations in solar activity as well as unusual climatic events, can and do cause predictably negative affects on agriculture. We must build resilient food systems that can address the unpredictability of the world we live in...



Goal #12. Ensure sustainable consumption and production patterns. Society, including all of agriculture must learn to address, utilize and transform the many forms of waste in our society...it's the smart thing to do and some of the "lowest hanging fruit" on the SDG list.



Goal #2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

As we look at the SDG's collectively, not in individual silos, it becomes clear that some of the most ambitious and transformational goals, ultimately are some of the easiest to accomplish once we recognize that collaborative, sustainable thinking and doing brings multiple benefits. We cannot accomplish all the goals on this list if agriculture is not doing well. But when you pull the food, energy, water and technology nexus together that sets the stage for success on a scale as big as the world and as small as your own community or home. If we don't maintain the capacity to feed a planet...this all important goal will continue to be unattainable...despite any effort to elevate humanity to a new level.



...successful farming sustains humanity!