

The Big Question: How Will We Feed Ourselves?

Challenges for Feeding the World in the Future



MADE FROM
PLANTS!



Daniel Riveong, Dr. Andy Hines, Alternative Perspectives, 10 November 2017

Table of Contents

Context of “The Big Question” Assignment.....	3
Approach 1: Casual Layered Analysis...and suddenly Spiral Dynamics	3
Summary Findings.....	5
Approach 2: The Six Pillars.....	5
A. Foundational Questions	5
B. The Six Basic Futures Questions.....	8
C. Six Pillars	10
Summary Analysis	14
Image References	16

Table of Figures

Figure 1. Futures Triangle on the Future of Food	11
Figure 2. Mindmap of the Trend & Systems. See source document here:	
https://embed.kumu.io/aad2c8955851a97d30af240a4fc5cca0	11
Figure 3. Global or Local? Science or Social Technologies?	12

Context of “The Big Question” Assignment

This assignment asks the writer to identify the single question that most concerns the writer about the future, and to use various foresight tools and frameworks to explore this question. The emphasis of the assignment is not only on the output of these processes, but also describe the writer’s experience with using these tools: *Did some parts work better than others? Were some parts difficult, or did they not generated much useful insight? What is your overall assessment of the tool, having using it to analyze your big question?*

In response to this assignment, I sought to apply two very different processes – a tool and a framework - to see how it can deepen my understanding of the question (“How Will We Feed Ourselves?”), especially to explore more my personal context and biases surrounding it. I choose to use Casual Layered Analysis (Approach 1) and Six Pillars (Approach 2), specifically to understand the difference between using CLA as a stand-alone tool versus employing Sohail Inayatullah’s entire Six Pillar framework.

Approach 1: Casual Layered Analysis...and suddenly Spiral Dynamics

The first approach focused sought to use only CLA, analyzing the headlines and identifying the underlying trends and myths. However, it became apparent that it would be useful to employ Spiral Dynamics to frame the different types of headlines and the myths that drive them. I describe this in more detail in the summary findings section of this approach in the next section.

CLA Level	Findings
Litany (Headlines)	<p>Negative / Fear</p> <ul style="list-style-type: none"> • “China consumes more than a quarter of the world's meat. The government wants to change that” • “UN urges people to eat insects to fight world hunger” • “Earth has lost a third of arable land in past 40 years, scientists say” • “The Observer Climate change: how a warming world is a threat to our food supplies” • “KFC Needs to Take Responsibility for Africa's Obesity Crisis” • “UN report: one-third of world’s food wasted annually, at great economic, environmental cost” • “In A Grain Of Golden Rice, A World Of Controversy Over GMO Foods” <p>Positive / Hope</p> <ul style="list-style-type: none"> • “The ‘impossible burger’ bleeds, but does it taste good?” • “What is clean meat and will it replace traditional agriculture?” • “Vertical farms on the rise in land scarce Singapore” • “First Ultra High Yield Aeroponic Container Farm Delivered In U.S. Centers Around Patented Vertical System” • “A vegan chain you’ve never heard of is expanding nationwide — and that should scare McDonald’s” • “Veganism 2.0: Five Reasons Meat-Eating Is Becoming Passé

<p>Trends & Systems</p>	<p>Fear</p> <ul style="list-style-type: none"> • Climate change & Industrialization • Income & Demographic change • Urbanization & Industrialization • Food discrimination • Bugs are gross, but lobsters and shrimps are delicious • Logistical & Infrastructure challenges • Regulation / Activists fear over GMO <p>Hope</p> <ul style="list-style-type: none"> • Behavior change <ul style="list-style-type: none"> ◦ Orange to Green: Go Vegan, Go Local • Market adjustment to new demands / behavior change
<p>Worldviews</p>	<p>Negative</p> <p>Orange Dysfunction</p> <ul style="list-style-type: none"> • Eat what you want, anytime everywhere • Mexican-Imported Avocados & Toast in Shanghai, China • Air-shipped Alaskan Salmon in Jakarta, Indonesia • “It’s our turn” view by non-OECD countries • Economic Growth is an Absolute Good • Urbanization is progress • Culture Norms about what is Food <p>Green Dysfunction:</p> <ul style="list-style-type: none"> • What’s natural is good (bad at the extreme) <p>Positive</p> <p>Green Functional:</p> <ul style="list-style-type: none"> • Serve the Common Good <p>Orange Functional:</p> <ul style="list-style-type: none"> • Techno-Solutionism
<p>Myths</p>	<p>Negative</p> <ul style="list-style-type: none"> • Orange Dysfunctional: God gave us the Earth to as we wish • Orange Dysfunctional: Growth without consequences <ul style="list-style-type: none"> ◦ Whatever we want, now and anywhere ◦ Material wealth correlates with Happiness • Green Dysfunctional: Gaia’s creations are perfect <p>Positive</p> <ul style="list-style-type: none"> • Green Functional: Harmony with Gaia • Orange Functional: Enlightenment Ideals

Summary Findings

My initial approach was to use CLA as a tool to contextualize the issues and uncover hidden biases and value systems behind it. I sought to use CLA as a method to explore what these myths and value systems looked like. I am a strong believer in CLA as a sensemaking tool as I believe that many of the world's conflicts and disagreement arise from competing ways of seeing the world. Thus, making a decision is not about who is right or wrong, but rather understanding the context.

Identifying litanies was the easiest step of the process, especially as the future of food was a personal interest of mine since my wife is a chef. Yet, once I went into the trends and systems layer, I realized that there are separate topologies behind the litanies and trends & systems layers. As the process of CLA led one to cover the myths and value assumptions behind the litanies, it made sense that I could see these different systems in terms of spiral dynamics.

While I intuitively felt these certain litanies and trends & systems could be grouped together, going through this exercise was still a powerful insight. It shifted my mind from "these two intuitively go together for me" into "I absolutely see why these two can be a powerful combination."

I am now curious how often could we uncover spiral dynamic patterns lurking behind CLA? For Dr. Cindy Frewen's Social Change class, I looked at how to frame Singaporean work culture within a social change theory. I reviewed the "Causal Layered Analysis Project: An inter-agency project to explore the socio-economic aspirations of Singaporeans" from Week 4/Week 5. Lo and behold, again I can see how the CLA framework for Singaporean values could be deepened with CLA. Today, Singapore consider themselves as very "Kiasu" (orange & accomplishment driven) but are now shifting towards "Kampung Spirit" (green & community focused).

Approach 2: The Six Pillars

In comparison to using CLA as a standalone tool, I applied Sohail Inayatullah's Six Pillars framework for the second approach, including following each of the foundational questions, the basic six futures questions, and the six pillars. I choose to use this approach as I believed that this framework has a powerful ability to deconstruct and make aware one's internal bias, context, and internal myths, while the CLA is more external focusing on society's larger context. These were assumptions I was eager to experience and test as I had previously never thoroughly implemented Inayatullah's entire Six Pillar framework.

The Six Pillars framework consists of three components: six foundational questions, six basic futures questions, and the six pillars.

A. Foundational Questions

Where quotations are used, the questions and explanations below are taken directly from Sohail Inayatullah's "Six pillars: futures thinking for transforming" paper.

1. **The used future**

“Have you purchased a used future? Is your image of the future, your desired future, yours or is it unconsciously borrowed from someone else? When we look at Asian cities, we see that they tend to follow the same pattern of urban development that western cities did generations ago”

My borrowed future is from the past. I am a big believer in the Green Revolution and what it has done for the developing world. Based on this, my automatic assumption is that whatever wrong from the Green Revolution can be solved with additional know-how and science.

Furthermore, growing up with *Star Trek: The Next Generation*, I have always been fascinated by the replicator. So perhaps for me, subconsciously technology-based future of food has always been a part of me. Additionally, one of my friends is an investor in a 3D printed food and an edible crickets startup. This reinforces my belief that we can use technology to address our food challenges.

2. **The disowned future**

The one we truly want, but has become “the self disowned, the future pushed away, that comes back to haunt us.”

I am not sure if I have a disowned future as Inayatullah defines it. However, I do have futures that I like that I think are impractical. I have romantic notions about organic and local food and agriculture, but assume that it is not practical. I assume that given climate change, loss of arable land, changing food consumption behaviors, and so on that favoring the “natural” over employing all the best means to grow food – GMO to clean meats to aeroponics – must be embraced.

This view of the world is still exterior based (“what we can change in the world), rather than interior (“how we can change ourselves”). In neither my preferred or this “disowned” future, do I think about changing eating behavior, such as veganism or eating locally, but rather look to outward solutions.

3. **Alternative future**

“We often believe that there is only one future. We cannot see the alternatives, and thus we make the same mistakes over and over. But by looking for alternatives, we may see something new. We are not caught in the straitjacket of one future.”

One alternative future would be a holistic plan to tackle the whole system of eating. Not just the technology of how food is grown, but also what food is (insects, offal) and our consumption behavior (local v. imported, vegan v. meat heavy).

Another alternative is to focus on eating behavior exclusively, such as vegetarian-focused options to introducing a wider array of types of food that effectively use what we have (greater use of offal meats or “ugly” fruits).

4. **Alignment & inner Alignment**

“We need to align our day-to-day problem-based approach with strategy... Often an organization or individual has a particular strategy of the future – to achieve a certain goal, but its inner map does not reflect that strategy”

With no organization or any direct “skin in the game”, I do not have the means to comment. I have made an effort to eat less meat and be more conscientious about eating more seasonally and locally. I have not participated in any funding in supporting new forms of food, such as soylent or aeroponics but neither have I invested in any thing else.

I suppose at this stage my internal alignment is towards behavior change only, while I still prefer holistic use of behavior and technological change.

5. **Models of social change**

“Do you believe that the future is positive and you can do something about it? Or is the future bleak and there is nothing you can do about it? Or is the future created by the 100th monkey?”

I believe the future can bend towards certain patterns or direction, but nothing is for sure and thus the future can be acted upon and created.

My idea of social change is that it is fundamentally a complex phenomenon. There are numerous variables and interweaving systems and subsystems. Yet, we can see patterns and cycles through strange attractors. And as social-technology is a huge part of humanity’s path – ideas, power structure culture, science-based technology, etc – than memes are an appropriate way to see change spread through the system and emerge.

In short, the future is something I can do something about. It starts with an idea that is acted upon.

6. **Uses of the future**

“Creating strategies, capacity building, creating conditions for a shift.”

The use of futures must be all the above. We need to expand our mental space of possibilities, we need to connect vision to strategy, we need to create the capacity for change, and we need to create the conditions for change – as change is not necessarily top-down but often from some emergent phenomena. When dealing with wicked problems, the scale of these problems requires all the above.

B. The Six Basic Futures Questions

The questions below are taken directly from Sohail Inayatullah's "Six pillars: futures thinking for transforming" paper.

1. *"What do you think the future will be like? What is your prediction? More and more progress and wealth? Wealth for the few? A dramatic technological revolution? Environmental catastrophe? Why?"*

I believe that a system focuses on maintenance over survival in the short term, and overall most systems "see" and "think" within the short term by default. Thus, humanity – if we consider it as a system – will not react and change course until it needs to. I believe that the future of food will follow this path.

Yes, we are seeing changes in behavior and investment in new technologies, but what is needed is for the 7 billion – and soon perhaps 9 billion – people to be onboard. There has not been a "tipping point" to signal to the world or countries that: "oh no, we need to change." Perhaps it will be gradual, like the environmental movement in US or Europe, but I am also betting (hoping?) that as conditions become more dramatic, the shift will move from gradual to immediate.

2. *"Which future are you afraid of? Random acts of violence? Do you think you can transform this future to a desired future? Why or why not?"*

My fear? Climate change and behavior change (increased meat consumption, etc) that occurs too abruptly for the system to make quick adjustments, creating the risk of a partial collapse. A 2017 paper called "[Food scarcity and state vulnerability: Unpacking the link between climate variability and violent unrest](#)" forecasts increasing difficulty in Africa and Middle East, likely – it predicts – leading to conflict as the same scale that beset Africa in the 1990s. They set their timeline as occurring in the near future, only 20-30 years from today.

The paper argues that food insecurity and poor governance reinforce themselves, marking poorly governed countries in Africa and the Middle East especially susceptible to downward spiral and violent conflicts. Already today, instability in [Syria](#) and [Egypt](#) have been linked to food and water supply issues.

As I said above, I do believe that humanity will only act once the threat is knocking at its door and no longer an abstract fear. Thus, while I fear the future that the paper predicts, I also believe it can be the pivotal event that transforms humanity into collective action

3. *"What are the hidden assumptions of your predicted future? Are there some taken-for-granted assumptions (about gender, or nature or technology or culture, or . . .)?"*

My assumption with my predicted future from the first question are the following:

- Technological capability and ability to scale deployment are possible today or around the corner
- The key actors in the global community can react to extreme stress (climate change, famine, climate refugees etc) with collective action rather than a Hobbesian response
- “Wicked Problems” in times of crisis can be solved with current human social and science technology, if seen as a critical and high-priority issue

4. *“What are some alternatives to your predicted or feared future? If you change some of your assumptions, what alternatives emerge?”*

Alternative prediction:

- Instead of responding to a crisis with thoughtful collective action, countries respond in a Hobbesian everyone-for-themselves manner, igniting conflict.
- Instead of responding to a crisis with thoughtful collective action, well-positioned countries opportunistically use their new “food power” to extract resources from food scarce countries.
- Instead of finding technological solutions, collective action fails to identify practical, scalable technologies to solve food scarcity issues leading to unavoidable famine and likely conflict.
- Humanity comes to gather to address the future of food and food crisis by rethinking the concept of food and food consumption, rather than relying on the traditional Western approach of technology as the leading solution.

Alternative fear:

- Instead of an abrupt climate change leading to a food crisis, climate change occurs slowly enough for humans to gradual adjust to it as the “new normal” resulting in a steady decline of

5. *“What is your preferred future? Which future do you wish to become reality for yourself or your organization?”*

My preferred future is that humanity will find scalable and sustainable technological solutions to guard against any potential threat to food supply due to climate change. My assumptions are that in this scenario:

- Climate change will happen and it will have negative effects on food production.
- Technology will be able to counter any negative consumption behavior changes, e.g. increased demand for meat.
- Countries and organizations will coordinate to ensure that such technologies are scaled and provided for all countries and of people of all economic classes

6. *“And finally, how might you get there? What steps can you take to move in toward your preferred future? As it says in ancient Buddhist texts, much of the solution to the challenge of life is simply in being pointed in the right direction.”*

Thus far, I have only adjusted my diet to be less meat focused. I have not taken any substantial steps to support new food technologies. I have tried Hampton Creek vegetable-based mayo and would love to try the Impossible Burger, but there are simply not available where I am.

If my finances permit, I would like to join my friend who has invested in numerous food-tech related companies. Today, there are plenty of choices of new food technology companies. The past ten years have lots of interesting food technology developments:

- Clean meats, bioidentical foods, wine clones, and vegan substitutes - developed by companies such as Impossible Burger, Hampton Creek, Memphis Meat, Clara Foods, Replica Wines, etc.
- Commercial viability of aeroponic food growing such as [AeroFarms](#)
- [New generation](#) of [agricultural robots](#) that can use greater precision for watering, use of pesticide, fertilizer etc.

C. Six Pillars

The Six Pillars are the final step in the process. They consist of performing futures thinking around mapping, anticipation, timing, deepening, creating alternatives, and transforming. For each pillar Inayatullah suggests different tools can be used such as 2x2 Shell scenarios and Dator's four archetypes of the future for the creative alternatives pillar.

For this exercise, I thought it better to think of a country or a province to make the exercise the interesting and have more depth to play with. In this case, I will assume to be a "Food Security Czar" for the White House.

1. Mapping

"In the first pillar, past, present and future are mapped. By mapping time, we become clearer on where we have come from and where we are going."

- Tool used: Futures triangle
- Others that can be used: futures landscape and shared history

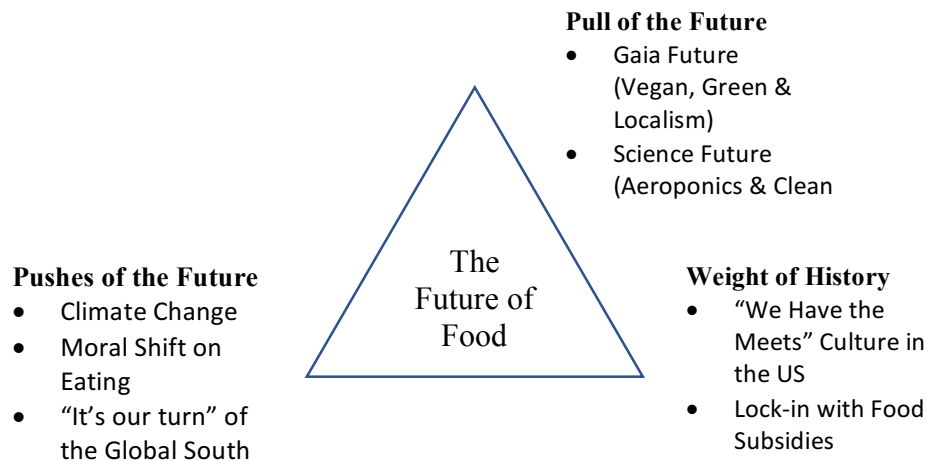


Figure 1. Futures Triangle on the Future of Food

2. Anticipation

Anticipation “seeks to identify issues before they become unwieldy and expensive. And, of course, to search for new possibilities and opportunities.”

- Tool used: Hybrid futures wheel & mindmapping
- Others that can be used: Emerging issues analysis

I developed a very basic mindmap to plot the trends and systems that I identified from the CLA exercise (Approach 1) and expanded from there:



Figure 2. Mindmap of the Trend & Systems. See source document here: <https://embed.kumu.io/aad2c8955851a97d30af240a4fc5cca0>

3. Timing of the Future

“This is the search for the grand patterns of history and the identification of each one of our models of change. Do we believe that it is the creative minority that creates the new system? Or do we believe that you can’t fight city hall, that is, deep change is impossible.”

To respond to the models of time that Inayatullah has mentioned, I do not see the future as functioning as a clock, karma, or a game of snake and ladders. As I mentioned earlier, my basis for viewing the world is that it is a world of complexity.

Yet, I also believe that seeing the future as moving in a spiral as a useful model, not because I believe it true in a literal sense but to overcome a human limitation of our imagination. I fear that if we see the world as linear that we negate the past too readily and if we look at things as a cycle we get stuck attempting to create previous histories (a nostalgia) that simply does not exist anymore.

By looking at the future as a spiral, then we are free to borrow from the past and adapt it to the present and future. And when need be, we can also find something new – that may remind us of other eras – vaguely rhyme with the past (from any time and place). Inherent in this thinking is the assumption that anything new we create has some analogy with the past.

4. Deepening the Future

Deepening the future seeks to unpack the litany of the day-to-day headlines and deepen our understanding of the trends, worldviews, and myths behind them. For this pillar, I used the CLA method from Approach 1 of this paper, as it was relevant and would be identical work.

- Tool used: CLA
- Others that can be used: four-quadrant mapping

Please see the CLA from Approach 1.

5. Creating Alternatives

I created a quick 2x2 scenario chart that focuses on local vs. global efforts and science-focused technology vs. social (behavior) focused technologies. I believe that in reality we will see different combinations of the two axes playing out across the globe. The 2x2 is only useful prism for looking at its extreme logical conclusions.

- Tool used: 2x2 Scenarios
- Other tools that can be used: single variable, archetypes, organizational, and integrated scenarios; and nuts and bolts.

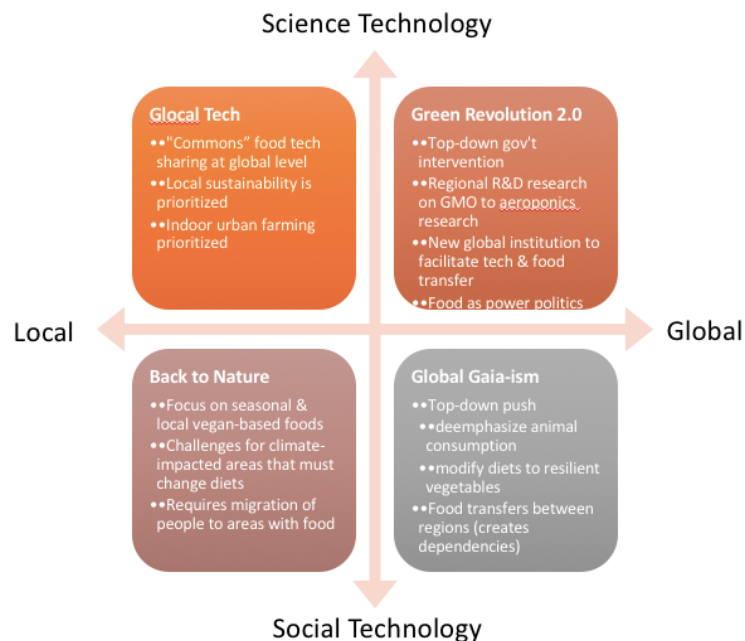


Figure 3. Global or Local? Science or Social Technologies?

6. Transforming the Future

“In transformation, the future is narrowed toward the preferred. Which future do individuals desire? Which futures do cities want?”

- Tool Used: “Mental Time Travel” visioning
- Other tool that can be used: preferred scenarios, visioning, backcasting, triangulation.

For this pillar, I chose “Mental Time Travel” as described by Olivier Markley in his “Visionary Futures: Guided Cognitive Imagery in Teaching and Learning About the Future” paper. Mental time travel is an “imaginary time travel journey in which the participant envisions living in a number of scenes involving different culturally specific locations, both past and future.” Instead of visiting different alternatives, I opted to simply let my mind wander around in a future Singapore.

I imagine myself visiting Singapore many decades from now, taking a self-driving shuttle bus to the local hawker (traditional food courts). The weather is hot, but thankfully the hawker centre maintains a gentle freeze, generated by the massive ceiling fan above.

The old uncles and old aunties (an affectionate term for older people in Singapore) are sadly no more, but delightfully there are still people preparing the food. There’s automation – dish collection, dish washing, serving, payment systems – but there are still people taking orders and cooking many of dishes. But those old faces have been replaced with young Singaporeans.

My favorite dish – char siew (BBQ’d pork) and noodles – was still on the menu, but it’s only available on Fridays. Otherwise, there’s still lots of other choices, but it’s different now. More vegetables. And a differentiation between clean meats and heritage meats. Heritage were local, pricier but only on special days – pork day was Friday.

I felt sad that it’s not Friday, but rather Thursday but an old man next to me pointed out “No need so sad lah! Europe got quota, we can eat how much, but Friday only. Is okay what?” (Apologies for my bad attempt at approximating future Singlish vernacular). An idea of a food quota was crazy for me, but every country and region needs to find their own path.

I traveled again but into the night, walking along a promenade as people enjoyed their evenings. Walking past restaurants, I spied at signs of what they offered. There were heritage restaurants, upscale nouveau restaurants to street corner dining, and everything in between. The heritage restaurants were attempting to re-create 20th century ingredients and cooking. The nouveau made no distinction between “heritage” and “new” or “Michelin-rated chef” or “Michelin approved robots”, but served the latest trends and experiences. Meanwhile, the rest were a mix of automated experiences or restaurants for Singaporeans who enjoyed a more human touch to running a restaurant (services to cooking).

Grocery stores didn’t seem to distinguish different either. GMO, clean, vegan-alternatives, heritage, etc. But the big difference was premade meals dominated. Robochefs have changed food just as much as the different food movements.

Summary Analysis

I can see how the entire Six Pillars process is both very adaptable and powerful, far more powerful than CLA alone or CLA with spiral dynamics. I found the six foundational questions as an incredible way to identify one's one personal bias. When I looked at my own borrowed and disowned futures, it helped me understand that conception of the future was not linear but had hidden levels. They're not bad, understanding these different levels allowed me to reevaluate my orientation more thoroughly.

The six basic questions overlapped a bit and was easier for me to go through. For better or worse, I feel that I have a fairly developed sense of the future so the questions about time and the future (in questions #1 & #2) were simple and not too insightful for me. However, the questions that asked me to flip assumptions helped me create new alternative futures I had not considered. Most specifically, it asked me to confront the assumptions of my preferred scenario (technology and top-down driven) and made me realize how (at least to me) how impractical it could be. I now understand that a more integral top-down/bottom-up method is required. I should not rely on a global crisis as a catalyst for global top-down action.

I wish I had more time to go through each of the six pillars thoroughly. While I attempt to do at least one exercise – that is, use one tool – for each pillar, it was a very lengthy process. I felt it was worth it and worth investing even more time, but I wonder how this would work in a group setting.

Of the six pillars, I appreciated the use of the futures triangle to understand how the different ways the present, the past, and images of the future influence my orientation and that I should more conscientiously identify the variables among those three vectors and choose what to do with them.

And most surprisingly for me, was the use of visioning for transforming. I did not think I used the tools as exactly as how Inayatullah nor Markley intended, but it definitely helped me understand the future in a less model-based but more “real” (as in day-in-the-life) way that I found incredible insightful.

I never thought about shifts in eating behavior that would revisit older behaviors (e.g. meats on special days only) or the idea that upscale restaurants in the future may make no differentiation between clean v. heritage meats or GMO vs. local heritage, as long as it delivered on the experience. It's a more integral view. And I completely missed the use of robochefs in my idea of the future of food. Could there be new ways of cooking – ineffective for human-based home cooking or restaurant cooking – but are actually are more nutritious and practical with robots?

Could more local, made to order foods be more practical and less food wastage/less transportation achieved when robots can do the cooking? How about robots chefs becoming Michelin rated overnight? All you have to do is download the latest recipes from a famous chef in – say – Shanghai or Barcelona and have it matched with Michelin-approved local ingredients suppliers.

But, I digress!

While I still find CLA very powerful in understanding “beyond the headlines”, I felt it was great to use the Six Pillars approach to understand my own orientation and hidden assumptions, while creating new alternatives of the future. My question, however, is how to conduct such a deep, emotional process with clients? I would love to learn more from someone who has tried to use Inyatullah methods with different kinds of audiences. How do they know which tool to use for each pillar, and so on?

Image Reference

1. Cover Image:

Thakur, Monika. Header image. Digital image. Google tries to nab Bill Gates-backed veggie burger business. July 30, 2015. Accessed November 01, 2017.

<http://www.homecrux.com/2015/07/30/31817/google-tries-to-nab-bill-gates-backed-veggie-burger-business.html>.

Bibliography

Inayatullah, Sohail. "Six pillars: futures thinking for transforming." *Foresight* 1, no. 1 (2007). 4-21.

Markley, Oliver. "Visionary Futures: Guided Cognitive Imagery in Teaching and Learning About the Future." *American Behavioral Scientist* 32, no 3 (1998). 522-530.

Markley, Oliver. "Imaginal visioning for prophetic foresight." *Journal of Futures Studies* (2012). 17. 5-24.