WHITE PAPER

Yoga, Personal Transformation, and Global Sustainability

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"What does yoga have to do with global sustainability?" A fellow passenger on B. K. Bose's return flight from India posed this question quizzically. He heard that B. K. had just delivered a talk on yoga and global sustainability at a conference in Haridwar. B. K. politely asked him why he cared, and he said that in addition to being a high-tech executive in Silicon Valley, he was the sustainability commissioner for a Bay Area city, and so began a long and pleasant conversation.

B. K. asked, "Is it possible to have world peace if even *one* of us does not have peace inside ourselves?" The passenger thought for a bit and said that it was not possible, that if even one of us held hatred in our heart, peace in a family, community, country, or the world would be impossible. And then B. K. asked the corollary question, "Is it possible to have global sustainability if even one of us does not leave the smallest possible carbon footprint on the planet?" Again, the passenger thought for a bit and said, "It's impossible; just one individual or small group can wreak havoc on the environment through a life or organization."

Icebergs in Columbia Bay, Alaska (DI01939) Photo by Zhenya Gallon
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We often rush to blame greedy corporations and self-centered nations that are exploiting and polluting our fragile planet irresponsibly and disproportionately, forgetting that individuals design systems, build organizations, and constitute nations. We are the corporations and self-centered nations. We are equally quick to look outside ourselves for solutions to global warming and climate change, but it seems we often forget that our efforts to change our *external* environment need to be balanced by our efforts to change our *internal* environment, ourselves.

Scratching the Surface

When B. K. asked his fellow passenger what the sustainability commission was working on, he mentioned commercial energy efficiency. No doubt that it is important, since energy efficiency could reduce our utilization of fossil fuels. The burning of fossil fuels is the primary culprit behind climate change. Additionally, fossil fuel reserves are finite, and if we do not stop using them now, the impacts on people and the planet are going to be incomprehensible, particularly since we can do something about it now. The hard part is to figure out how to get people to do something now, to change their behaviors in a way that leads to a more sustainable future.

Christine Daniel (2013), the city manager of Berkeley, where B. K. lives, sent the 2013 annual report to residents, highlighting how "the city is acting to green its operations." The report mentions library retrofits that focus on energy-efficiency features, curbside recycling that diverts additional types of plastic away from landfills, and land-use decisions that promote cycling, walking, and public transit. She continued on to say, "The actions we are taking increase energy efficiency, reduce water consumption, promote alternatives to driving, minimize landfill waste, and expand the urban forest [by planting trees alongside streets and in parks]."

All of these initiatives are noteworthy attempts toward reducing a community's carbon emissions by a few percentage points per year, but they do not necessarily lead to individual choices that each person consciously makes in his or her daily lives. In the case of the City of Berkeley, the city council set a goal to reduce emission levels by 33 percent between 2000 and 2020. Several other cities have declared or are considering similar initiatives. In short, we are already doing too little, too late! Solutions must become personal and bold, and our actions must be consistent with long-term plans at a variety of scales!

Impacts of Climate Change

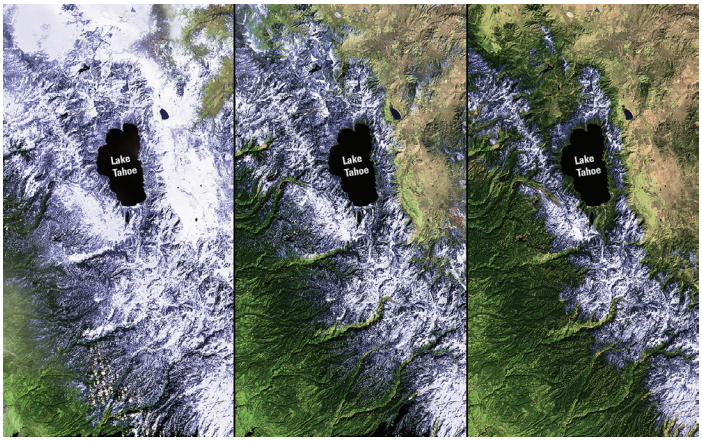
In the second decade of the twenty-first century, nearly 100 percent of climate scientists agree that climate-warming trends over the past century can be attributed to human activity. In September 2013 the Intergovernmental Panel on Climate Change (IPCC, 2013) concluded that it is extremely likely that human influence has been the dominant cause of the observed warming since the mid-twentieth century. It is no longer a matter of scientific dispute that climate change poses real challenges for current and future generations and that impacts of the changing climate are already evident in most regions of the globe. Human-induced climate change has put Earth's population and its ecosystems in a vulnerable position and demonstrates the challenge of planning long-term for sustainability.

Continued emissions of greenhouse gases will cause further warming and changes in Earth's systems. Limiting climate change will require substantial and sustained reductions of greenhouse gas emissions. The report pointed out that climate change would affect carbon-cycle processes in a way that will exacerbate increases in carbon dioxide in the atmosphere. As the oceans attempt to absorb excess carbon, their acidification will increase (IPCC, 2013). For these reasons, every one of us must take action to change the way we live. We can no longer wait for city, state, and federal governments, or international bodies to take actions on our behalf.

Feedback Loops

Natural systems have feedback loops that move systems toward order out of chaos or to a more stable state. Equilibrium is nature's ideal, or balance. Climate change is a part of a feedback loop consequent to human actions that are disrupting the balance in the climatic system, leading to negative impacts for life on Earth. For example, when glaciated mountains loose their ice pack due to increased global temperatures, dark rock is exposed that absorbs the sun's heat, whereas snow reflects heat back into the atmosphere. Consequently, Earth becomes even warmer, leading to increased melting of snow and ice, and creating a negative feedback loop that further increases risk for all life on Earth.

Our population has been exploding over the past two hundred years (figure 1): one billion in 1830, two billion in 1938, four billion in 1974 to six billion in 1998, and currently over seven billion. In the future, the population has the potential to decrease to 6.2 billion (low variant) by 2100, but only if there are lower birth rates and/or higher death rates. If neither is attained, the global population could reach 15.8 billion (high variant) by 2100. However, the United Nations projects that the likely global population by 2100 will be 10.2 billion (medium variant) (United Nations, 2013).



Source: U.S. Geological Survey, Landsat Missions Gallery "Drought Conditions in California, USA," U.S. Department of the Interior / USGS and NASA.

It is fairly certain that increased demand on available resources is expected to be severe in regions with populations that are most vulnerable to climate change and that are already prone to conflict. Indirectly, climate change is expected to heighten scarcity challenges in the following ways: (1) weaken states' abilities to meet basic needs for its citizens; (2) negatively impact agricultural production, particularly in

already vulnerable and conflict-prone locations; (3) create absolute scarcity that cannot be addressed by adaptation measures; and (4) with its asymmetrical effects, challenge existing resource cooperation and adaptation mechanisms (Matthew, 2008). More directly, climate change may lead to increased water scarcity, exacerbating challenges directly related to food security.

The failure of traditional human institutions to come to grips with climate change—to perceive the threat, formulate a coherent and flexible response, and then enact it with vigor and discipline—is all too plain. Nearly all climate scientists now agree that climate-warming trends over the past century can be attributed mainly to human activity, and it is no longer a matter of scientific dispute that climate change poses real challenges for current and future generations. Humanity has been aware of climate change for decades, yet for the most part neither individuals nor institutions have been able to respond at the appropriate scale or speed. We have failed to significantly reduce carbon emissions or our reliance on fossil fuels, a triumph of short-term interest in sustaining or raising current levels of energy consumption over our long-term welfare.

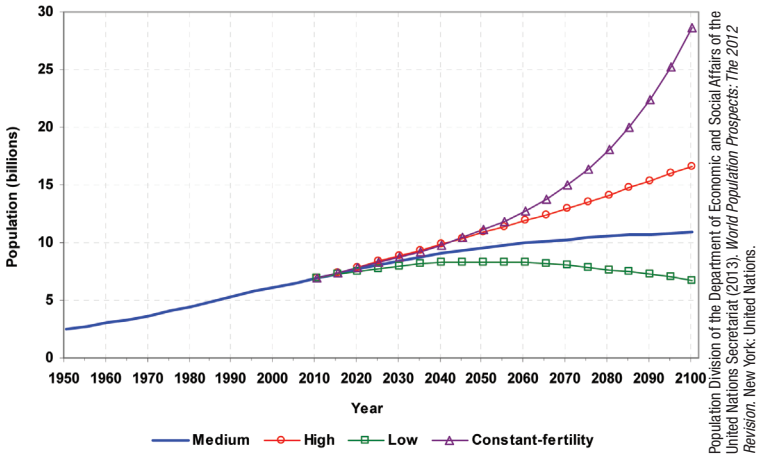


Figure 1: The population has the potential to decrease to 6.2 billion (low variant) by 2100. If lower birth rates and/or higher death rates are not attained, the global population could reach 15.8 billion (high variant) by 2100. However, the United Nations projects that the likely global population by 2100 will be 10.2 billion (medium variant) (United Nations, 2013).

The paradox is that our evolutionary history has equipped us for long-term planning and action. Humans possess a highly advanced capacity for mental "time travel" and are arguably unique in the degree to which we can recall past events and anticipate future scenarios. To an extent, at least, we can imagine and predict multiple, complex outcomes and act accordingly in the present to achieve desired outcomes in the future. This general capacity is very old; the first direct evidence for it is found in the two-million-year-old stone tools shaped by our distant ancestors.

Moreover, humans regularly do make long-term plans: we invest in retirement accounts, establish trust funds and endowments, and buy insurance, for example. However, while these plans sometimes have long-term impacts on society, they frequently yield results that will directly affect only the individuals themselves or the next one or two generations. Evolutionary theory suggests a reason for that too: we care most about our genetic relatives—great-grandparents, grandparents, parents, children, grandchildren, and great-grandchildren, or an approximate span of 140 years that includes both past and future family members. Beyond that most people do not care much about the past or the future.

To embody and act upon those concerns that extend beyond family to others and to times beyond our own lifespans, humans have created institutions. Governments are preeminent among the institutions that are supposed to perform this role, but as already noted they have not been effective at addressing climate change. Fortunately, humans are creatures of culture, the product of learned human behaviors and actions that are not only rooted in genetic inheritance, but are also related to cultural inheritance. In sum, we have the capacity to rise to the challenge in our own lives despite the failure of institutions, but it requires a cultural shift that begins with self-awareness, mindfulness practitioners as citizens and consumers. Yoga and meditation have evolved over thousands of years, long before the births of Christ and Buddha. Herein lay the answer to behavior change through the alignment of our actions with our thoughts and plans: behaviors can be transmitted and can change over time.

Personal Transformation and Global Sustainability

We have learned a lot by asking how humans contribute to climate change, but we rarely ask *why* we leave a larger-than-necessary carbon footprint.

Why do we want what we want and confuse what is a want with what is a need? Why do we choose what is pleasant in the short term and not what is good in the long term? The elders of a Native American tribe called the Onondaga Nation remind us that the way they traditionally decided on individual and collective courses of action was to ask, "What is the impact on the next seven generations (Macy and Gahbler, 2010)?" This is an example of a mindful approach to the future and an approach that we've lost in Western technocratic societies. We intuitively know that the answers to these questions are related to our individual and collective actions—actions that can increase or decrease our carbon footprint. And if that is true, then personal transformation and individual behavior change that aligns our immediate actions with our long-term interests is a necessary condition to achieve global sustainability.

Let's turn to Professor Tim Jackson (2009), the economics commissioner of the United Kingdom's Sustainability Development Commission, who says that if we are serious about avoiding the worst effects of global warming, we must question economic growth itself. He shows that in the United States and in several other developed nations, earning more than approximately half the median income does not increase happiness or improve well-being. And yet, if we do not break

our addiction to economic growth and our need to satiate our need for immediate gratification, we risk great harm by causing global warming and ecological collapse. Jackson consistently emphasizes that in addition to economic changes, we need social changes that shift our emphasis away from materialistic values. Mindfulness-based practices, such as yoga and meditation, offer a way to complete this shift.

Many believe that personal transformation is slow and inefficient compared to changing systems. Peter Senge, renowned expert in organizational learning and a member of the faculty at the MIT Sloan School of Management, says, "One of the fundamental differences between social systems (like a business or supply chain) and natural systems (like a rainforest) is that social systems are created by human beings. There can be no 'system' without the human actors who inhabit it and take the actions that bring it to life. Put differently, how the system works arises from how we work; how people think and act shapes how the system as a whole operates (Senge et al., 2008)." The key to global sustainability lay in aligning our thoughts and actions so they are congruent with our long-term interests as a species and life on Earth while requiring us to delay our need for immediate gratification. Yoga is a practice that makes this possible; Raja Yoga is our focus.

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Yoga for Personal Transformation

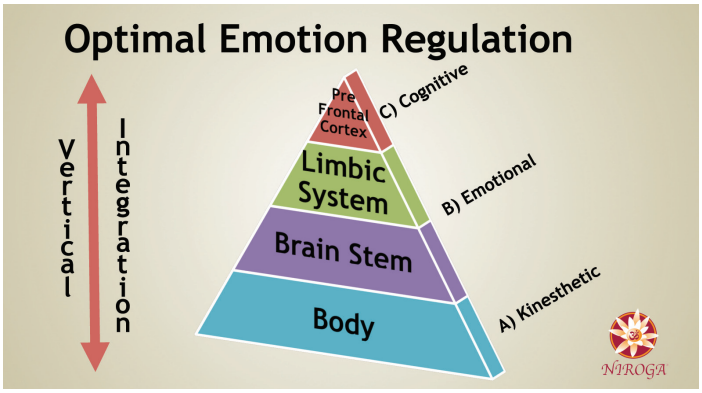
Philosophers, psychologists, and social scientists as well as experts in economics and systems theory all suggest the need to look within to investigate our thoughts and actions to shift our values to ensure global sustainability. Let us explore why the eight steps of Raja Yoga are an optimal approach for personal transformation. The first two steps that are the foundations of the practice are the *yamas* and *niyamas*. They involve an exploration of ten powerful and interrelated moral and ethical principles, with direct relevance to our actions that affect our carbon footprint as a species:

- Nonviolence *(Ahimsa)*: trying to be nonviolent toward all (animate and inanimate), in thought, word, and deed => decreasing environmental degradation, including pollution of air, land, and water.
- Truthfulness *(Satya)*: thinking and acting with intentionality in order to be established in truthfulness => increasing accountability for our individual and collective actions.
- Noncovetousness *(Asteya)*: investigating what we want and why, which enables us to analyze our attachments => reducing consumption.
- Self-regulation *(Brahmacharya)*: navigating the "middle path" between excess and deprivation, which helps us develop self-mastery => discerning need from want and choosing what leads to long-term good.
- Nonpossessiveness *(Aparigraha)*: exploring our relationship with what we have and shifting our perspective from owner to trustee => becoming responsible stewards of our environment.
- Purity *(Shaucha)*: exploring authenticity, where our thoughts, words, and actions are in greater alignment => practicing the universal code of ethics (what leads to the greatest good for the greatest number) for the longest time (adding a temporal dimension).
- Contentment *(Santosha)*: developing a sense of inner abundance, realizing that the best things in life are not necessarily the most expensive and tuning into "a different kind of luxury" (Couturier, 2010) => voluntarily embracing simplicity.
- Austerity *(Tapas)*: sacrificing or letting go of the nonessential and embracing what is essential, trying to live a life that matters => implementing "reduce, reuse, recycle" (the three Rs).
- Discipline (Swadhyaya): being diligent about living an examined and intentional life and developing the discipline to sustain it.
- Self-surrender *(Ishwara Pranidhana)*: surrendering to our better/higher selves and developing acceptance.

Each one of these yamas and niyamas can transform us profoundly, as we witnessed through two contemporary figures: Gandhi and his practices, which were underpinned by his philosophy of *satyagraha* (truth force), and the practices of Martin Luther King Jr., who was guided by agape (unconditional love). Both built their lives around the very first yama, and that philosophical foundation not only transformed their lives but also continues to touch the lives of millions long after they have passed away.

The next two steps are yoga postures *(asana)* and breathing techniques *(pranayama)*. Asana provides us a semblance of control of our bodies, through stress resilience and the healing of primary and secondary trauma. Breathing practices have evolved over thousands of years, utilizing the bidirectional connection between breath and emotion. Just as our breathing changes when we are sad or mad, we can regulate our breathing patterns and affect our moods and mental states. Herbert Benson's decades of research at Harvard's Mind/Body Medical Institute shows that deep rhythmic breathing invokes the "relaxation response" and favorably impacts several major physical systems including the cardiovascular, endocrine, nervous, and immune systems (Mitchell, 2013).

The next three steps are a progressive inward journey consisting of introspection *(pratyahara)*, deepening into concentration *(dharana)*, in turn deepening into meditation *(dhyana)*. Meditation—whether an open monitoring of our mental states or focused attention on one object, thought, or idea—enables our minds to become a little more calm and still, and less frenetically active.



Vertical Integration

Neuroscientists tell us that the essence of our ability to regulate our emotions lies in vertical integration (figure 2), a strong bidirectional connection traversing body, brain stem (mediates survival, the fight-flight-freeze response), limbic system (repository of emotions and memory), and prefrontal cortex (thinking and reasoning) (Siegel, 2011). The different steps of Raja Yoga map elegantly into this model as simply as ABC, where mindful *action* (asana) provides the kinesthetic connection to body, mindful *breathing* (pranayama) provides the emotional connection to brain stem and limbic brain, and mindful *centering* (dhyana) provides the cognitive connection to the prefrontal cortex.

As we systematically build our capability to regulate our emotions, it affects everything we do—what and how much we eat and drink, what we read and watch, who we hang out with and what we discuss, what/when/why we buy, and how we work, live, and play—in short, it determines our carbon footprint!

The Yoga Wheel

When groups of educators, health care professionals, and violence prevention officials around the country are asked two questions: (a) are you regularly stressed out, and (b) do you work with people who are regularly stressed out? invariably almost 100 percent answer with a resounding yes! Neuroscience tells us that chronic stress on our brains impacts (a) our ability to hold attention, (b) regulate our emotions, (c) cope in healthy ways, and (d) feel empathy with those around us (Davidson, 2012). Even as the implication of these impacts on individual and collective carbon footprints is obvious, neuroscience also tells us that mindfulness mitigates every one of these effects. We can think of the yoga practice as a wheel (figure 3), where yoga starts out providing us with optimal tools for stress resilience (top left quadrant).

As we develop stress resilience, we develop self-awareness (top right quadrant), and we begin to recognize the chasm of difference between "I am sad/mad/stressed" and "I am feeling sad/mad/stressed." As we systematically develop self-awareness, we gain greater ability to regulate emotion (lower right quadrant), the ability to act rather than react, to develop the self-control to resist an impulse to acquire something that we may want but do not need. All of these three capabilities then translate into healthy relationships (lower left quadrant) with everyone and everything around us, with growing empathy.

As we continue to traverse the trajectory of this wheel, it creates its own positive feedback loop, spiraling toward an evolution of our consciousness. This spiral leads us toward the eighth step of Raja Yoga, self-realization *(samadhi),* which is the awareness that we are all intimately interconnected and interdependent. As we move around the wheel aligning our thoughts with actions, we can adaptively reduce our individual carbon footprint and even curtail desires that lead to larger carbon footprints.

A Dissemination Model

Given the seriousness of the challenge of climate change and the urgency for comprehensive solutions, we believe we simply do not have the time to rely on governments nor institutions to take actions on our behalf. Conversely, we also understand that we have too little time to encourage all humans to dedicate themselves to be yoga teachers and practitioners, which involves years of training. Instead, we feel that we need to extract the essence of yoga and distill it down to a few minutes of practice that can be done regularly by anyone, anytime, and anywhere. And once we do that, we should be able to teach anyone off the street to utilize the essence of yoga to systematically develop the skills of stress resilience and emotional regulation.

Niroga Institute, a nonprofit based in Northern California, has done precisely that. Niroga has developed a series of twenty-minute sequences of yoga poses, breathing techniques, and meditation. Niroga is bringing these offerings to thousands of children, youth, and adults every week all over the Bay Area. These practices are known as Transformative Life Skills (TLS). Niroga also conducts day-long trainings annually for hundreds of educators and administrators, public and behavioral health professionals, social workers, violence prevention officials, parents and caregivers, nonprofit

staff, and corporate executives, nationally and internationally. Independent researchers have conducted multiple studies of TLS with children and youth in urban schools and have found that TLS does indeed decrease stress and increase emotional regulation when done regularly (at least three times weekly) (Frank, 2012).

It goes to show that we do not have to wait to become experts in transformative practices before sharing them with others. With a potent universal practice that anyone can do anytime and anywhere, we can keep traversing the yoga wheel, getting better and better at it. We are then able to share it with ever-increasing confidence and authenticity.

Imagine the possibilities if most of the one billion people in the developed world, where consumption is most rampant, were acting through emotional regulation and self-mastery most of the time, with each striving to be mindful of future generations. Humanity would make great strides toward leaving the smallest possible carbon footprint arising from a palpable awareness of interconnectedness. What an impact it could have on our families, communities, organizations, and countries, and what a powerful tipping point it would offer the world. Imagine the possibilities if every child in the world could learn these transformative life skills from childhood—we could possibly reverse global warming and save this fragile planet from disaster in a single generation!

References

Couturier, Andy (2010) *A Different Kind of Luxury: Japanese Lessons in Simple Living and Inner Abundance*. Southbridge, MA: Stone Bridge Press.

Daniel, Christine (2013) City of Berkeley Annual Report 2013.

IPCC (2013) *Climate Change 2013: The Physical Science Basis. Contribution of Working Group 1 to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Stocker, T. F., D. Qin, G. K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, and P M. Midgley eds. Cambridge: University of Cambridge Press. Available at: https://www.ipcc.ch/report/ar5/wg1/.

Davidson, Richard. (2012) *The Emotional Life of Your Brain*. New York: Hudson Street Press.

Frank, Jennifer (2012) "Results of Transformative Life Skills (TLS) Evaluation," Research Summary.

Gillis, Justin (2013, September 27) UN Climate Panel Endorses Ceiling on Global Emissions, *New York Times*.

Jackson, Tim (2009) *Prosperity Without Growth: Economics for a Finite Planet.* New York: Earthscan.

Look, Marie (2009, July 13) Trash Planet: Germany. *Earth 911*. Available at: http://earth911.com/news/2009/07/13/trash-planet-germany.

McKibben, Bill (2010) *Eaarth: Making a Life on a Tough New Planet.* New York: St. Martin's Griffin.

Macy, Joanna and Gahbler, Norbert (2010) *Pass It On.* Berkeley, CA: Parallax Press.

Mitchell, Marilyn. (2013, March 29) Heart and Soul Healing. *Psychology Today.* Available at: http://www.psychologytoday.com/blog/heart-and-soul-healing/201303/dr-herbert-benson-s-relaxation-response.

Senge, Peter M., Smith, Bryan, Kruschwitz, Nina, Laur, Joe, and Schley, Sara (2008) *The Necessary Revolution: Working Together to Create a Sustainable World.* New York: Broadway Books.

Siegel, Daniel. (2011) *Mindsight: The new Science of Personal Transformation.* New York: Bantam Books.

United Nations (2013, September 27) Human Influence on climate clear, IPCC report says. http://www.un.org/climatechange/blog/2013/09/27/human-influence-on-climate-clear-ipcc-report-says/, accessed 11 November 2013.

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