Introduction

Beginning of the 21st century marks the pinnacle of information technology and its resulting communication revolution. They play a key role in the evolution of humanity giving people the power to connect and share viewpoints, ideas and knowledge at an unprecedented speed with the whole world. People are becoming increasingly aware of this emerging interconnectedness with each other, the planet, and the entire universe. How they think and live, or what they eat and do to survive or thrive, are directly related to the human footprint on the planet. Resultant global chaos needs urgent attention to bring order. By using the overlapping academic parameters of Theory, Practice, Experience and Research, we have designed a roadmap in this paper. We specifically address strategies to fill gaps and suggest an implementation plan in the context of social work education and practice.

The organization of our paper is shown in Figure-1. Each arm extending from the circle in the figure corresponds to a section in our paper. There are seven sections. In Section-1 we explain Civilizational Collapse due to water shortages and food economy that Lester Brown has articulated. We focus on India on the issue of water shortages, and contrast it with the central role that water management played in the traditional Indian system of agriculture. In Section-2 we turn to the role of Women in Agriculture. This context is global, but by way of illustration, we focus on Indian women as the ‘hidden face’ of agriculture. We address important Millennium Development Goals (MDGs) in this section, and briefly introduce the pioneering work of Dr. Vandana Shiva, an international force of change, on the sustainable agriculture front.

Section-3 continues with a focus the impact of our Food Choices on a diverse set of major issues including personal to planetary wellness. In Section 4, we illustrate that many if not all problems of modern society can be traced to the Limitations of the Modern Science based on the unproven 17th century assumption that nature is only material and without consciousness. This assumption has led to an even-growing consumerism and great imbalance in personal lives with disastrous effects on the planet: Global warming,
massive water shortages, destruction of rain forests and ill effects of chemical and genetically modified agriculture on human health and serious water pollution, and the list goes on…. In Section 5, explains the Science of Mind, which gives practices to transform and reprogram the deeply embedded subconscious thought patterns, attitudes, and behavior. The findings in this section consist of the latest advances in Epigenetics: the new science of self-empowerment. An implementation of these advances is explained within the framework of Simplified Kundalini Yoga (SKY). Section 6 gives agriculture and food Sustainability Programs from two American Universities that can be widely adopted as academic models. Section 7 gives two
existing educational curricula and practices based in UK and USA. We propose a Roadmap to Implement for Faculty of Social Work (FSW) housed in the Maharaja Sayajirao University (MSU), Vadodara, India.

1. **Civilizational Collapse**

   Early Sumerian civilization declined and collapsed due to shrinking food supplies, rising salt levels in the soil—the result of a flaw in their irrigation system. For the Mayans, soil erosion exacerbated by a series of intense droughts apparently undermined their food supply and their civilization. For other early civilizations that collapsed, it was often soil erosion and the resulting shrinkage in harvests that led to their decline. Does our modern civilization face a similar fate? Lester Brown states, “…our food shortages could also bring down our early twenty-first century global civilization. Our continuing failure to reverse the environmental trends that are undermining the world food economy forces me to conclude that if we continue with business as usual such a collapse is not only possible but likely”. In an update to his book in 2013, he cited India’s “dangerous food bubble” due to unsustainable use of groundwater resources for agriculture.

   India developed a sustainable system of agriculture in the ancient period. Vrikshayurveda (the science of plant life) that developed in India is attributed to sage Surpala. Sadhale dates it around 1,000 AD, but references to ancient agriculture predate it to the Vedic period. A key component of the ancient Indian agricultural production was its relationship with skillful and wise water-management practices, because entire rainfall is mostly concentrated in the few monsoon months. Water management necessitated a certain degree of cooperation and collective spirit in the Indian countryside, and until the imposition of colonial rule, it precluded any widespread development of private property in India. Regional rulers, or local representatives of the state were generally obliged to allocate a certain percentage of the agricultural taxes on building and managing water-storage, water-harvesting and/or water-diverting structures which facilitated a second crop, and provided water for drinking and other purposes in the long dry season.

   Quoting Brown from India’s dangerous food bubble: “India is now the world’s third-largest grain producer after China and the United States. The adoptions of higher-yielding crop varieties and the spread of irrigation have led to this remarkable tripling of output since the early 1960s. In recent years about 27 million wells have been drilled, chasing water tables downward in every Indian state. Unfortunately, a growing share of the water that irrigates three-fifths of India’s grain harvest is coming from wells that are starting to go dry. This sets the stage for a major disruption in food supplies for India’s growing population.”

   What made India get off the track from its ancient agriculture system and move
into a highly unsustainable water management system and other practices involving chemical agriculture? This is a key question that needs a careful examination and analysis in the light of ancient Indian agriculture history and the adverse impact of colonization on these practices.

2. Women in Agriculture

Connection of women and agriculture is age-old in ancient civilizations. According to Swaminathan³, the well-known agricultural scientist, “some historians believe that it was women who first domesticated crop plants and thereby initiated the art and science of farming. While men went out hunting in search of food, women started gathering seeds from the native flora and began cultivating those of interest from the point of view of food, feed, fodder, fiber and fuel”.

Indeed, four decades of research demonstrates the varied and crucial responsibilities that women hold in agriculture and the value of their contributions, both economic and social. Rural women produce half of the world’s food and, in developing countries, between 60 percent and 80 percent of food crops⁴. Women also are more likely than men to spend their income on the wellbeing of their families, including more nutritious foods, school fees for children and health care. When credit is provided directly to a woman, it can increase household consumption and children’s schooling. Loan repayment rates are higher for women than for men⁵. Women also are integral to alleviating hunger and malnutrition because they are primarily responsible for ensuring that food for their families is reliably available, accessible and nutritionally balanced⁶. On an average, agriculture provides 64 percent of employment and represents 34 percent of gross domestic product (GDP) in the poorest countries⁷. Therefore, by focusing attention on women in farming, several MDGs (1,3,4, 7, 8) can be addressed.

If women farmers across the developing world had the same access to labor, fertilizer, extension services, and seeds as male farmers, yields would increase by as much as 20-30 percent per household, and reduce hunger for 100-150 million people⁸ (MDG 1). Equal access to production resources for men and women would raise total agricultural output in developing countries by 2.5–4 percent, contributing to food security and economic growth⁹.

Recent estimates show that only 5 percent of foreign aid that is directed to the agricultural sector focuses on gender equality⁴. Overall; the labor burden of rural women exceeds that of men and includes a higher proportion of unpaid household responsibilities related to preparing food, collecting fuel and water⁴. Women and girls spend a significant amount of time carrying water. According to Stanford researchers, a decrease of even 15 minutes in walking time to fetch water is associated with significant reductions in child mortality (MDG 4).

In developing countries economic growth originating in the agricultural sector
is at least twice as effective in reducing poverty as growth originating elsewhere. To solve the problems of poverty and hunger, the agriculture sector in these countries — particularly smallholder agriculture in which women are the driving force — needs to be more efficient (MDG 1).

The World Trade Organization has had a negative impact on women in agriculture. On average, a woman spends 14 hours a day working in and outside the home. During harvesting season she spends about 16 hours a day. According to the Sustainable Development Department of the Food and Agriculture Organization (FAO):

In the Indian Himalayas a pair of bulls works 1,064 hours, a man 1,212 hours, and a woman 3,485 hours in a year on a one-hectare farm, a figure, which illustrates women’s significant contribution to agricultural production.

The question arises why women’s role in the economy is not recognized and has been given such an inferior position? Indian women represent the ‘hidden face’ of agriculture. In rural India, the percentage of women who depend on agriculture for their livelihood is as high as 84%. Women also heavily participate in ancillary agricultural activities. Despite their dominance of the labor force women in India still face extreme disadvantage in terms of pay, land rights, and representation in local farmers’ organizations. Furthermore their lack of empowerment often results in negative externalities such as lower educational attainment for their children and poor familial health.

2.1 Women and Sustainable Agriculture

Dr. Vandana Shiva is an international force of change on the sustainable agriculture front. She founded Navdanya in India, which means “nine seeds”, and it symbolizes protection of biological and cultural diversity. This women-centered network of seed keepers and organic producers has spread across 17 states in India. Navdanya has helped set up 111 community seed banks across the country, trained over 5,00,000 farmers in seed sovereignty, food sovereignty and sustainable agriculture over the past two decades, and helped setup the largest direct marketing, fair trade organic network in the country. Navdanya is actively involved in the rejuvenation of indigenous knowledge and culture. It has created awareness on the hazards of genetic engineering, defended people’s knowledge from biopiracy and food rights in the face of globalization and climate change. Navdanya has also set up a learning center, Bija Vidyapeeth - School of the Seed / Earth University, on its biodiversity conservation and organic farm in Doon Valley, Uttarakhand, North India.

3. Food Choices

Worldwide popularity of convenient junk/fast food lacking in nutrition is an American corporate, profit-driven, endeavor
that began about 50 years ago. It is responsible for the rise of obesity, diabetes, and related serious ailments all over the world. Rise of obesity in the US is wide spread, and the consumption of prescription drugs has been rising.\textsuperscript{14}

The food habits in India have changed due to the western influence and the usage of fast foods is also on the rise. Varieties of instant/ready-to-eat foods available in catering industries as well as at homes are becoming a part of everyday life.\textsuperscript{15} There has been a major shift in food habits in the metropolitan cities. According to a survey undertaken in 2011 by the Associated Chambers of Commerce and Industry of India, about 86% of households prefer to have instant food due to steep rise in dual income level and standard of living, convenience, and influence of western countries. The survey on “Ready to Eat Food in Metropolitan Cities” is based on responses from 3,000 representative households with children or without children, nuclear family and bachelors mainly because many consumers in metros lead time-pressured lifestyles and have less time available for formal meals. As a result demand remains high for products which can be eaten on the go. It is also estimated that this food processing industry will show the annual growth of 40-60% in next five years.\textsuperscript{15}

According to research done by Worldwatch Institute’s Nourishing the Planet project, global meat production and consumption have increased rapidly in recent decades, with harmful effects on the environment and public health as well as on the economy. Worldwide meat production has tripled over the last four decades and increased 20 percent in just the last 10 years. Meanwhile, industrial countries are consuming growing amounts of meat, nearly double the quantity in developing countries. Much of the vigorous growth in meat production is due to the rise of industrial animal agriculture, or factory farming, which pollute the environment through the heavy use of inputs such as pesticides, herbicides, and fertilizers used for feed production. Large-scale meat production also has serious implications for the world’s climate. Animal waste releases methane and nitrous oxide, greenhouse gases that are 25 and 300 times more potent than carbon dioxide, respectively. In India, a country long associated with vegetarianism, and where slaughtering cows is forbidden, the overall meat consumption has grown by 14 percent from 2010 to 2012. Arable land is scarce, and it is directly impacting the rate of decline in available growing land because the animals are gobbling up this irreplaceable resource.

The prevalence of obesity is rising globally and in India. Chopra et al.\textsuperscript{17} published a survey article with a focus on overweight, obesity and related diseases in Asian Indian women. This review highlights the Asian Indian body composition with regards to obesity and provides a collated perspective of gender-specific prevalence of the co-morbidities. Recent data show that women have a higher prevalence of
overweight and obesity as compared with men in India and that obesity is increasing in the youth. Importantly, prevalence of abdominal obesity has been consistently higher in women than in men. South India (rural Andhra Pradesh, 2006) reports the lowest prevalence (6.0%) of type-2 diabetes mellitus in women, where as the highest (14.0%) is reported in the urban areas. Although the clustering of cardiovascular disease risk factors was generally high, it increased further in post-menopausal women. There are a number of factors that predispose Indian women to obesity; sedentary behavior, imbalanced diets, sequential and additive postpartum weight gain and further decrease in physical activity during this period and cultural issues. In view of these data, preventive measures should be specifically targeted to Indian women.

Researchers and health professionals have long been aware of the consequences associated with eating fast food, but until now, no one realized how quickly the damage begins. A new study, published in the Canadian Journal of Cardiology, indicates that damage to the arteries occurs almost immediately after just one — that’s right, one — junk food-type meal. Based on the science, moderation with junk food doesn’t really exist. What is even more shocking is the fact that corporate marketing of junk food is especially targeting children18. So what is nutrition, and why do we care?

Food is really little more than a median for soil-based nutrients. Drawing from the earth, nutrients inherent to fertile soil transform into plant matter. Now biologically usable by animal and human alike, this nutrient-infused plant has transformed compounds from the soil into digestible sustenance for its consumer19. Plants grown in nutrient-rich soil serve as a vessel by which nutrition is transferred to whomever, or whatever, eats them. This being the case, it is also true that very few nutrients exist in plants that have been grown in over-farmed soil. Those crops are simply void of nutrients that have been extracted by numerous plants grown on the same lot of land previously, each one of lower nutritional value than the one before.

The benefits of basing your diet on nutrient-rich, plant-based whole foods will dramatically reduce your risk of disease, turn off your hunger signal and cravings, boost your overall health and allow you to mentally and physically outperform those who are on junk/fast foods. It will help preserve the environment, and ensure that there’s sufficient arable land in which to grow nutrient-rich food. Will increased demand for meat lead to more competition among farmers and food companies for valuable natural resources such as water and land and, rather than solving India’s food problems, will further exacerbate it? This is one of most pressing issue that India and the world face because it is directly tied to civilizational collapse explained in Section-1.

4. Limitations of Modern Science

Abraham Lincoln said in 1864 during the American Civil War, “As a result of the
war, corporations have been enthroned and an era of corruption in high places will follow”. What followed is a direct testimony to the visionary prediction that Lincoln made. Western multinational corporations called the ‘Empire’ run the world”. The corporate empire was built on the modern technology and the singular profit motive. Modern science, and consequently modern technology, is based on the unproven 17th century assumption that nature is only material and without consciousness. Understanding consciousness and how it functions in humans as well in other manifestations of nature remain largely elusive to the modern science. Many aware scientists, activists and environmentalists are using modern technology to assess and continuously report the state of the planet. The food and water shortages, health and health care crises, extensive deforestation, environmental disasters, growing disparity between rich and poor, and exploitation of the weak and vulnerable is evident. Brown describes the widespread efforts that are being made to reverse many of these trends through developing solutions. Although these efforts are commendable, a balanced approach that also transforms the human consciousness is urgently needed to expedite the progress. We elaborate on this statement in Section 5. In this section, our focus is to briefly explain how corporate sector is creating major disruptions to the environment and human health through modern technologies that they operate and control. We restrict our focus to agriculture and food safety in what follows.

The chemical and biotechnological corporations have taken control of global agriculture. For example, ‘green revolution’ in Indian agriculture in the 1960s introduced pesticides and other chemicals in it. Although it greatly increased the crop yields in the short run, the effects of chemical pesticides and fertilizers on human health have been rather grim. The unfortunate Bhopal gas explosion of a pesticide plant in 1984 inspired Vandana Shiva to give up her career in Physics to become an activist and an organic farmer. The cultivation of the genetically modified crops has drawn worldwide attention including India due to its adverse effects on the environmental and the human health. We suggest Jeffrey Smith, who established the Institute for Responsible Technology, for his excellent contributions and information on these topics.

Dr. Shiv Chopra, a Canadian microbiologist and an activist of Indian origin, has widely written giving insightful details about the corruption in the government concerning food safety. Time and again, he voiced opposition to the government’s attempt to allow dangerous drugs, agricultural practices, and carcinogenic pesticides to enter the food supply, and upheld the policies of the Food and Drug Act and its regulations. Multinational corporations that make drugs and chemicals for agricultural and food inputs influence and manipulate the government regulatory agencies in-charge of food and drug safety and get approvals. Most importantly, this book contains a blueprint for the establishment of food safety and security throughout the world.
5. The Science of Mind

Inquiry into mind, its origin and how it functions have a long tradition in psychology, neurosciences, philosophy, religion, as well as the ancient science of yoga. Yogiraj Vethathiri (1911-2006), a contemporary philosopher, who developed the Simplified Kundalini Yoga (SKY) system, gave a deep philosophical and scientific understanding of mind. We take some highlights from his works to explain what mind is, and its relevance to Epigenetics: The New Science of Self-empowerment. Building on this scientific foundation, we explain how the deeply embedded subconscious thought patterns and attitudes towards women could be tackled, which require a monumental shift in the human psyche.

The fundamental concept of life force is necessary to understand mind. It is also known by other names in the literature, such as Kundalini energy in the yoga literature, Qi in Chinese holistic healing, and Bioelectricity in Acupressure. Vethathiri postulated that life force current in a living system as a group of very minute ‘life-force particles’ circulating throughout the physical body of a living system. Circulation of the life-force particles may be formally compared to the ‘flow of electrons’ in a wire that explains why life force is called bioelectricity. Life-force particles generate Bio-electromagnetic (BioEM) field just like the flow of electricity in a physical object generates electromagnetic (EM) field. Our statement supports the hypothesis of a close connection between life force and BioEM. Indeed, Waechter based on an extensive and an independent review of the literature hypothesized that Qi or the life-force, is either the same or closely related to the modern concept of BioEM energy. Vethathiri postulated that BioEM energy is transformed for carrying out involuntary functions like breathing, digesting food etc., as well as voluntary functions involving all the five senses, and mind. These insights imply that BioEM is directly related to mind, which is needed in our explanation given below that brain frequencies correspond to mind frequencies.

The electrical nature of brain is well known to the modern science. It is supported through an Electroencephalogram (EEG), an instrument that records the electromagnetic activity of the brain through attaching electrodes to a person’s head. Therefore, EEG measurements are interpreted as the frequencies that correspond to different states of brain. There are four ranges of frequencies that pertain to the activity of the human brain as a wave: Beta (12-35 cycles per second (Hz), Alpha (8-12 Hz), Theta (8-4 Hz) and Delta (4-0.5 Hz). How do these frequencies correspond to that of human mind? Mind is not material and therefore is not the same as the brain. How are the two connected? It is a big challenge to the modern science.

To understand how mind and brain are connected, we consider the ‘life-force particles’ that circulate throughout the physical body of a living system including
the brain. Therefore, we assert that the BioEM field that is produced by the life force particles is common to both mind and brain. According to Dhamodharan\textsuperscript{31}, “it is impossible to separate the waves of the mind and the brain”. Indeed, EEG frequencies are commonly used to interpret states of mind. For example, Beta wave frequency corresponds to day-to-day activity like talking, reading, playing etc. Alpha corresponds to a state of calmness that one experiences in meditation, taking a walk through wilderness etc. Theta corresponds to deep meditation and relaxation. In Delta frequency, a person loses body and material consciousness and experiences what Indian sages described as non-dual nature of reality. In summary, as one reduces mental frequency, one transitions from material consciousness towards pure consciousness.

The latest advances in epigenetics show that the subconscious mind is a repository of ‘stimulus-response’ information that is derived from learned experiences and from instincts. This information in children is acquired till the age of 6 when they are in Delta and Theta frequencies. After that they begin to function in Alpha and then in Beta that is the domain of the conscious mind. Therefore, to reprogram the stored information in the subconscious mind that is not conducive for human behavior, it is necessary to bring the mind to Theta and Delta frequencies, and then reprogram the stored information through affirmations.

Lipton and Bhaerman\textsuperscript{30} list a dozen belief-change modalities, and any one of them can be used to reprogram the stored information in the subconscious mind. To this list we add the SKY system that is most suitable for the modern age. It includes two stages of meditation that are directly relevant to reprogramming the subconscious mind: Thuriya and Thuriyateetha\textsuperscript{25}. On the basis of EEG measurements on himself, Dhamodharan\textsuperscript{31} observed Theta frequency in Thuriya and Delta frequency in Thuriyateetha. Once a practitioner goes into these states during meditation, affirmations need to be given for reprogramming the subconscious mind. It is a two-step process.

6. Sustainability Models

There is a great need for people of the world to get off corporate convenience food and start producing clean food. This would involve initiating grass-root farming projects including student farms in the university settings. The Sustainability Agriculture Institute (ASI) at the University of California at Davis\textsuperscript{32} in 2011 established a new undergraduate major in ‘sustainable agriculture and food systems’. ASI provides a hub that links initiatives and education in sustainable agriculture and food systems across all divisions of the college of agriculture and environmental sciences, across the university of California, and across the State of California.

Various disciplinary academic departments and programs at the university can play a role in the farm project, as figure-2 shows.
7. **Roadmap to Implementation**

We have selected two very unique academic programs from UK and USA to guide us in designing a roadmap to an implementation plan that covers different issues described in above sections. First is the Schumacher College that, through an innovative approach to learning, with experts from around the world, has helped thousands of organizations and individuals to understand and find solutions for the most pressing ecological and social concerns of modern life. We draw attention to the short courses that are offered at the college. Three topics are taken for illustration: (i) Eating Ecologically - Healthy, Local and Sustainable Food. This course explores the nutritional benefits of consuming a wide range of plant foods and how a diverse and healthy diet can be produced locally, organically and sustainably using...
permaculture principles. (ii) Schumacher Certificate in Ecological Leadership and Facilitation – Transformative Change in a Volatile World. An eight-month learning program that explores a new model of leadership and facilitation, especially designed to meet the challenges and adventures of an increasingly volatile and complex future. (iii) Economics of Happiness: The new science of happiness. The limitations of gross domestic product (GDP) as a measure of societal wellbeing are now widely recognized. Drawing heavily on recent insights in fields as diverse as psychology, biology and anthropology, this course will explore some of the more interesting alternative measures of wellbeing that have emerged in recent years, including the Happy Planet Index.

Naropa University is a Buddhist-inspired, student-centered liberal arts university in Boulder, Colorado. A recognized leader in contemplative education, Naropa’s undergraduate and graduate programs emphasize professional and personal growth, intellectual development, and contemplative practice.

A national conference on “Integrating yoga in Modern Education” is being organized in Vadodara, March 21-23, 2014. FSW-MSU is a co-sponsoring organization. We have taken a schematic diagram from the conference web site to illustrate how the conceptual ideas that the two universities, Schumacher College and the Naropa University emulate, can be joined together to structure a paradigm shift in education.
For the purpose of illustration, we present a conceptual roadmap for an ‘ongoing’ seminar course—entitled Transformation for the Modern Age—that can be offered in any university and college in India including MSU. A holistic framework includes four components: Theory, Practice, Experience and Research. The course would involve local faculty, guest speakers, documentaries, book reviews followed by discussions and instruction in meditation, introspection, physical exercises, plant-based healthy diet, and rest that is pertinent to personality transformation. Reforming the existing education system would transform the consciousness of both men and women, and motivate women to take leadership role in creatively addressing contemporary challenges. This course is designed to introduce students to global challenges and to approaches for implementing solutions. Once this pilot project is successful, it can be taken to other Indian colleges and also introduced internationally.

In conclusion, we quote Mahatma Gandhi: “The difference between what we do and what we are capable of doing would suffice to solve most of the world’s problems.”

Acknowledgements

We are grateful to several colleagues in India and the USA for their cooperation in this project. Dr. Ramanath Pandey, Oriental Institute, MSU, Vadodara, and the Conference Coordinator of ISIS 204, introduced the first author, a graduate of FSW, to Dean Parmar, FSW, which generated an invitation to this conference. We are grateful to Dr. Jagdish Kohli for his outstanding help with the graphics in the last section of this paper. Ms. Jill Owen kindly gave input on references and Patricia Eichorn gave professional editing help. Seager’s book is a valuable resource for invaluable data on the women of the world.

References

http://www.earth-policy.org/plan_b_updates/


http://ncw.nic.in/pdfreports/impact%20of%20wto%20women%20in%20agriculture.pdf
http://ncw.nic.in/pdfreports/impact%20of%20wto%20women%20in20agriculture.pdf
http://shivchopra.com/corrupt-to-the-core/
http://sust.unm.edu/
http://thenationshealth.aphapublications.org/content/40/8/E37.full
http://vitalsigns.worldwatch.org/trends/food-agriculture
http://www.fao.org/focus/e/women/sustin-e.html
http://www.fao.org/sd/ WPdirect/WPre0108.htm
http://www.icrw.org/what-we-do/agriculture-food-security
http://www.naropa.edu/about-naropa/.
http://www.schumachercollege.org.uk/.


Lipton, B. (2005). The Biology of Belief, Mountain of love/Elite Books, Santa Rosa, USA

Organization for Economic cooperation and Development (OECD), The Development Report 2011


________________________________________________________