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Das Magazin behandelt die transdisziplinäre Zukunftsforschung, die Früherkennung und die prospektiven Sozialwissenschaften. Es macht deren neuen Erkenntnisse der Fachwelt, Entscheidungsträgern aus Politik, Verwaltung und Wirtschaft sowie einer interessierten Öffentlichkeit zugänglich.

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Die Redaktion ist verantwortlich für die redaktionelle Umsetzung der gesetzten Themen und für die inhaltliche Qualität der Artikel, die in Deutsch, Englisch oder Französisch verfasst sein dürfen und auch in der jeweiligen Sprache publiziert werden. Sie sucht Autorinnen und Autoren mit der entsprechenden Expertise und beurteilt, ob die eingereichten Artikel die erwünschten inhaltlichen Qualitätsstandards erfüllen. Dabei ist es wichtig, dass eine prospektive Sichtweise eingenommen wird, was szenarisch oder auch spekulativ erfolgen kann. Beiträge, die diesen Anforderungen nicht genügen, werden zurückgewiesen. Abgelehnt werden auch Artikel, die kultur- und sozialwissenschaftliche Standards nicht berücksichtigen, die thematisch nicht zur Ausrichtung des Magazins passen, die eine kommerzielle Absicht verfolgen oder die in irgendeiner Weise diskriminierend sind. Alle Beiträge werden sorgfältig redigiert – und bei dieser Redaktion der Artikel können auch Mitglieder des Vorstandes einbezogen werden.

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EDITORIAL

Liebe Leserinnen und Leser,

wie kann man über die Zukunft einer territorialen Einheit namens Indien nachdenken, deren Geschichte und Kultur derart komplex ist, dass schon eine Beschreibung der Gegenwart scheitern würde? Indien ist ein Land der Widersprüche: Die Gesellschaft ist stratifiziert in ein Kastensystem, das offiziell seit 1949 nicht mehr existiert, denn Indien ist eine Demokratie. Zugleich wird das Kastensystem nach wie vor reproduziert, womit soziale Ungleichheit kulturell institutionalisiert wird. Die Gesellschaft ist ethnisch, religiös und kulturell höchst divers, was dazu führt, dass in Metropolen wie New Delhi oder Mumbai Paralleluniversen von unterschiedlichsten Sprachen und Kulturen existieren: örtlich nah, kulturell und mental hingegen weit voneinander entfernt. Die Frage, ob der Hinduismus überhaupt eine Religion ist, ist religionssoziologisch nicht eindeutig beantwortet. Anzufügen ist, dass der Präsident Narendra Modi und seine Bharatiya Janata Party (BJP) eine hindunationalistische Identität heraufbeschwören, die es so eigentlich nicht gibt und die zur Exklusion von Minderheiten führt – insbesondere von Menschen, die dem Islam angehören.

Auch sozialökonomisch ist Indien ein Land der Widersprüche. Einerseits prosperiert Indien: Nach Dekaden des Protektionismus und bitterer Armut ab Mitte des 20. Jahrhundert wuchs das Bruttoinlandprodukt Indiens ab der Jahrtausendwende bis zu sieben Prozent pro Jahr. Im Zuge dieser Entwicklung haben sich die Mittelklassen innerhalb von knapp zehn Jahren auf 600 Mio. Menschen verdoppelt. Als Folge dieser Entwicklung befinden sich in indischen Städten Slums oftmals in Nähe von Wolkenkratzern. Bangalore gilt als Indiens Silicon Valley, Mumbai ist eine Finanzmetropole. Allerdings bleibt trotz der Prosperität die sozialökonomische Disparität hoch. Der sehr harte Lockdown im Frühling 2020 verschärfte diesen Gräben und führte Mio. Menschen in bittere Armut.

Indien ist nach China das bevölkerungsreichste Land der Welt: Aktuell leben dort knapp 1,4 Milliarden Menschen. 2050 sollen es gemäss UNO-Szenarien 1,6 Milliarden sein, 2100 dann wiederum «nur» noch 1,45 Milliarden.

Wohin entwickelt sich Indien? Wir haben ausgezeichnete Autoren und Autorinnen gewinnen können, die in ihren Artikeln mögliche Zukünfte Indiens skizzieren. Der Umweltwissenschaftler Saahil Waslekar thematisiert in seinem Beitrag die drohende Wasserknappheit in Indien – und er erläutert Strategien, wie dieses Problem bis 2050 gelöst werden kann. Sheela Suryanarayanan, die das *Centre for Women's Studies* an der Universität Hyderabad leitet, beschäftigt sich mit den negativen sozialen Folgen der kommerziellen Leihmutterschaft, die zwar vor zwei Jahren verboten wurde, die aber als «altruistische» Leihmutterschaft weiterhin existiert. Sebastien Hug, Aparna Kumaraswamy und Archit Kansal von swissnex in Bangalore berichten über die Technologie «Aadhaar», mit der über 1,2 Milliarden Menschen in Indien erfasst worden sind, was mitunter zu einem gesellschaftlichen Misstrauen gegen staatliche Institutionen führt. Anu Ramdas beschäftigt sich in ihrem Artikel mit den Dalit, also der unberührbaren Kaste – und mit der Frage, warum diese in sich heterogene Gruppe vom Westen als homogen wahrgenommen wird. Sie kritisiert den westlichen Blick als eurozentrisch und unterstellt ihm, eigene Kategorien auf Indien zu projizieren.

Der Künstler Raphael Perret, der längere Zeit in Indien verbracht hat, berichtet über eine partizipative Kunst, der er das Potenzial zuschreibt, eine zukünftige Gesellschaft zu gestalten. Avinash K Singh und Sarah Ahamed von der India

Future Society beschäftigen sich mit dem Einfluss der Naturwissenschaften und der Technologie auf die Alterung der multiethnischen Gesellschaft in Indien. Der Politologe und Zukunftsforscher Daniel Stanislaus Martel setzt sich in seinem Artikel «Indiens Griff nach den Sternen?» mit den Hintergründen und Motiven der Raumfahrt-Ambitionen Indiens auseinander. Remo Reginold, Politologe und Co-Direktor des Swiss Institute for Global Affairs (SIGA), behandelt die Feindschaft zwischen Indien und China, die die Geopolitik im 21. Jahrhundert noch substanziell umgestalten werden.

Ich wünsche Ihnen eine inspirierende Lektüre.

Francis Müller

INHALT

RESEARCH ON AGING AND LONGEVITY IN INDIA: HISTORICAL BACKGROUND, PRESENT STATUS AND FUTURE DIRECTIONS

The quest for longevity, just why living beings age and other pertinent existential questions have preoccupied humankind since time immemorial. The Indian subcontinent has witnessed many undulations since the dawn of human civilization, and Indian people have addressed such existential questions differently at various points in history. The use of science and technology today has enabled a clear understanding of India's aging demographics. Such understanding and knowledge are essential for scientists and longevity researchers to shape the field of aging studies as a whole, globally. India, famously known for its diverse gene pool, languages, religions, cultures, etc., is a multi-ethnic country. It thus provides a uniquely multi-faceted perspective on one of the most challenging questions asked by humanity, which is, human aging.

Keywords: Ayurveda, Demography, Future, Healthcare, India, Longevity

Sarah Ahamed and Avinash K Singh

Introduction

In demographic studies, the term longevity is used interchangeably with «life expectancy». The average life expectancy as estimated by the United Nations as recently as 2019 was 72.6 years; a greater average age than any country in the world could have boasted in the 1950s. In view of this trend, the UN has made distant future projections and calculated average life expectancy in economically developed countries to be approximately 105-106 by the 23rd century (UN World Population 2300). The UN also predicted the gap in life expectancy between developed and developing countries would amount to 20 years. However, technology transfer may go help in closing this gap. India, an emerging and developing country (EDC) in South Asia, and cradle of many of the world's ancient civilizations, already appears to have bucked this trend. According to National Health Profile data of 2019, in 1970-1975 India's average life expectancy was 49.7, but has gradually increased and in 2012-2016 increased to 68.7 (National Health Profile 2019).

In the ancient period between 3000-1500BC the Indian Ayurvedic system developed methods for managing ageing. Unani, another common medical system practiced in ancient India that dealt in detail with the aging process was, introduced via Islamic physicians in the medieval period (13th to 17th century) from Byzantine Greece (Poulakou-Rebelakou 2015). In modern day India, the shift to geriatric issue management has primarily focused on demographic research and different aspects of aging in an effort to understand population aging and devise policies for the elderly. More recently, several research groups in India address the molecular mechanism of aging by detecting oxidative damage in DNA with the help of immunochemical reagents, DNA damage due to aging and repair, etc. (Ashok 2013). The focus of this chapter is to understand the general attitude towards aging and longevity of the Indian people in bygone eras, to assess the peculiarities of the aging demographics of India in the present day, and discuss the role India can play in future human longevity and geriatrics.

The Historical background of longevity research in India

The Indian Medical system, also known as Ayurveda, is one of the oldest known healthcare systems in the world. Ayurveda is a Sanskrit word in which *Ayur* means Life and *Veda* means science, and thus combined denote a science of life. Ayurveda dates back to the Vedic period 3000-1500 BC (Saraswati 1988) and is based on scientific principles. Sushruta, one of the towering figures of Ayurveda described the four pillars of successful therapeutic intervention, as Physician (Chikitsak), Drug (Dravya), Nurses (Upasthata) and Patient (Rogi), (Meulenbeld, G. J. 1999). The Buddhist kings in India (400-200BC) were the highest patrons of Ayurveda. Under their patronage, Ayurveda thrived and became quite an evidence-based scientific study of maladies and their remedies. The system of disease diagnosis (Nidana) was provided based on specific indication (Purvarupa), symptoms (rupa), the

conducting of a physical examination and disease case history (Nizamie/Goyal 2010).

The Ayurvedic medical system pertaining to geriatrics and rejuvenation studies was termed Rasayanatantra. It is one of the eight medical divisions found in the system. These eight fields are Kāyachikitsā (General Medicine), Kaumāra-bhṛtya (Pediatrics), Śalyatantra (Surgery), Śhālākyatantra (ENT), Bhūtavidyā (Psychology), Agadatantra/Vishagara-vairodh Tantra (toxicology), Rasāyantantra (rejuvenation science, Vājīkaraṇatantra (Reproductive Science), (Bhishagratna, Kaviraj Kunja Lal 1907). Rasayana or Rejuvenation Science documents various age-related disorders like loss of memory, vigour, cognitive decline. Rasayana claims ways to overcome senility to restore youth and a healthy state of organs to attain longevity. Rasayana under Ayurveda is a drug-based therapeutic intervention for aging tissues in the human body. With the help of Rasaya, the human body's aging tissues can attain a youthful state by implementing restorative remedies for the treatment and amelioration of senile shortcomings in vitality, memory, cognition, and longevity (Jee 1927). Rasayana therapeutics are derived from a wide variety of medicinal plants, animals, and dairy products (fat). However, Rasayana aims to treat patients holistically, i.e., drug therapy and specific lifestyle changes in diet, behaviour, social practices, etc. The Rasayana work on enhancing nutritional, digestive, circulation properties through the following:

Enhancing nutritive value – An excellent example is Shatavari, which works at the Level of Rasa, concerned with nutrition.
Enhancing digestive power so that nutrition is maximum absorbed – these work at the Level of Agni concerned with digestion and metabolism.
Enhancing microcirculation and tissue perfusion to absorb nutrients and increase nourishment – the lipid reducing effects of Guggulipid from Guggul (Commiphora guggul) works at the level of Spotansi and reduces the risk of arteriosclerosis.

Ayurveda also defines several geriatric indicators and ways to deal with them. Well defined gerontological terminologies such as Jivaniya (longevity-promoting), Balya (resilience promoting), Vaya sthapana (preventing aging), Cetaki (agility promoting), Sramkara (preventing fatigue), Medhya (cognition promoting) can be found in Ayurveda. It clearly reveals how Ayurveda rendered therapeutic interventions against aging scientifically. Ayurveda is just one great example of ancient India's systematic and methodological knowledge and longevity is one of its most essential topics of exploration. Ayurveda may be regarded as one of the greatest knowledge in the Indian context, however, the oldest books depicting humankind's collective knowledge are the Vedas or the texts of knowledge (Siddhantalankar 1969). Amongst the four Vedas (Rigveda, Samveda, Yajurveda, Atharvaveda), Rigveda mentions several plants and herbs that have medicinal properties found in a preparation called Chyavanprash for promoting longevity (Ramachandran 1985). In 1999, Manyam carried out an extensive review of the properties of the various medicinal plants prescribed in ancient Indian text, including Ayurveda and Vedas, recommended for the treatment of dementia. Another ancient Indian text, one of Vedas, Atharvaveda, mentions how lifestyle affects longevity and dictates specific roles at specific life stages. Two popular Ayurvedic texts, Charaka Samhita and Sushruta Samhita, feature terminologies related to geriatrics and mental health such as «smriti kshaya» and «medha kshaya» (memory decline and intellect decline), both symptoms of Alzheimer's Disease and Parkinson's Disease. Terms such as «smritibhransh» (cognitive decline) denoting senile degeneration caused by aging are referred to in the present day as a symptom of Alzheimer's Disease (Das Gupta 1968). Medicinal remedies such as Brahmi or Bacopa monnieri, Amlaka (Indian Gooseberry) for dementia, and memory deterioration in old age are recommended in Ayurveda (Rao, 2005). Ayurveda prescribes a specific diet consisting of whole-grain food, fruits, and vegetables, exercise, yoga to prevent cognitive disorders like Alzheimer's (Weiss, 1986). Research shows mental stimulation and social networking decreases the risk of dementia in the aged population. In antiquity Ayurveda focused on community sense to prevent social isolation of the elderly (Holtzman 2004). Psychotherapeutic philosophies found in scriptures like Bhagwad Gita helped curb fear of termination and existential depression in the elderly. Maintaining health was pursued with the utmost seriousness in ancient Indian philosophy and culture. Ayurveda observed «old age is the foundation of all wisdom, virtues, enjoyments (bhoga) and the source of all ‹purusharth› (dharma, arth, kam and moksha).» (Warrier 1998). Aside from Vedic cultures and Ayurveda, at different stages of its civilization, India has brought forth multitudes of ethnocultural and religious sects. Amongst them, in terms of religion, are Hinduism, Sikhism, Jainism, Buddhism, Christianity, Islam, Bahai, Judaism, Zoroastrianism, etc. Contemporary India is a rich blend of these diverse influences emanating from such a wealth of traditions, cultures, and religions (Tiwari 2013).

Present status: Peculiarities in Aging Demographics of India

India has undergone vast cultural changes down the ages, and many ancient Indian practices like Ayurveda or Unani medicine have diminished in significance. In terms of the medical sciences, law, scientific

research methodology, policymaking, etc. India has largely adopted western practices (Arnold, 2013). Great changes in the demographic composition of India have also occurred correspondingly. According to UN 2015 Data, India constitutes 17 % of the world's total population and has a whopping 1.31 billion people living in the country (Agarwal et al. 2020). Currently, India's population is the second largest behind China but is estimated to exceed that of its neighbour by 2028. India's aging population (over 60s) is growing at three times the rate of the general population (Giridhar et al. 2014). Average life expectancy is increasing due to the availability of better healthcare, nutrition, and sanitation. Life expectancy at birth was 67.5 in 2015, which is a stark rise in contrast to 36.2 years in 1950.

Fertility rates are falling due to better access to effective contraception. Improved recognition of women's rights has led to an increase in marital age, and with a lower infant mortality rate. In 1950, the fertility rate of the Indian population was 5.9, compared with 2.3 in 2013. Future projections estimate a drop to 1.88, lower than the replacement level. All these factors contribute to a great segment of the population advancing to old age. (Bloom et al. 2014). In 1960, the percentage of the population over 60 was 5.4 %, roughly 20.3 million. This has grown to 9 %, which by today's figures amounts 116 million older citizens. The United Nations Population Division estimated in 2015, that if the population steadily maintains medium fertility, the number will rise to approximately 19 % thus 324 million individuals aged over 60. All such data and projections are a warning that the aging of the population may result in a crisis of quite devastating proportions.

Several ongoing studies are closely investigating this India's potential aging crisis. However, such studies are both complex and difficult due to stark ethnic variations differing in biogeographic localization, lifestyle, dietary habits, and sociocultural practices (Agalwal et al. 2020). In 2010, Harvard University T.H. Chan School of Public Health, the International Institute of Population Sciences (Mumbai, India), and the RAND Corporation began studying India's aging problems by conducting a Longitudinal Aging Study in India (LASI). In 2010, the LASI pilot study was carried out in 950 households, comprising almost 1683 individuals (over 45s) of contrasting socio-cultural diversity across four states (Punjab, Rajasthan, Karnataka, and Kerala). Following this pilot group, LASI advanced its study in 2017 covering 15 states in their full-wave data collection, beginning with a sample size of 60,000 individuals (over 45s). In April 2017, data collection for Phase 1 of Wave 1 was conducted in Karnataka, Uttar Pradesh, Rajasthan, Chhattisgarh, Gujarat, and Haryana, the union territories of Delhi–National Capital Region, Madhya Pradesh, Daman and Diu, and Dadra and Nagar Haveli. The other remaining Indian states are now participating in Phase 2 of Wave 1. The aging biomarkers focused on are Anthropometry (height, weight, waist, and hip circumferences), systolic and diastolic pressure, pulse rate, pulmonary function test, grip strength and timed walk, vision test, balance test (semi tandem, full tandem, side by side). The survey method employed to record respondent data collection is CAPI (Computer-Assisted Personal Interview), where field personnel carried out face to face interviews and recorded the responses on their laptops. On the subject's consent, LASI gathers data on DBS (Dried Blood Sample) to conduct DBS Assay on haemoglobin to determine glycated haemoglobin, a pilot study for vitamin D, and whole-genome sequencing, C-reactive protein level, antibody levels for Epstein-Barr virus (EBV). Other Biomarkers are also proposed, such as Cytomegalovirus (CMV), Interleukin-6 (IL-6), Cystatin C, vitamin D, and blood lead levels from DBS. The collected DBS Assay is anonymized by barcode technology, stored, and processed in National AIDS Research Institute (NARI), Pune, India (IIPS 2010).

Notably, aside from several ethnic groups, India's Parsi Zoroastrian ethnic group, known for outliving the average Indian, has spearheaded a very specific genome mapping project for their population in India (Patell 2020). The Parsi community is a small, homogenous group localized within a limited geographical area in India. The mapping project of the Parsi genome has been dubbed the Avesta Genome Project (Guzder 2010). It aims to create a complete genetic and genealogical database for the Parsi community to help pinpoint genes that may contribute to human longevity.

In addition to important genomic profiling, these surveys have assessed other challenges faced by the aging population in India, most importantly non-communicable disease (NCD) and multi-morbidity in the aging population. The NCDs affecting most of India's older people are diabetes, cancer, heart diseases, chronic respiratory diseases, hearing impairment, and eyesight disorders. However, NCDs surpass all other major illnesses faced by aged people. India's elderly face a «triple burden of diseases» death caused by infectious disease, chronic disease, and death cause by violencelence, termed (Bloom et al. 2014). Expenditure in terms of healthcare and loss of productive years may amount to 4.3 trillion USD due to NCDs and chronic mental and physical disorders in the elderly. This would result in a massive economic crisis, according to a 2014 World Economic Forum (WEF) report. A staggering amount of evidence shows a positive correlation between the number of years spent in disease caused by a population of

increased longevity (Arokiasamy and Yadav 2014). The significant risk factors contributing to chronic diseases and NCDs are tobacco usage, obesity, sedentary lifestyle, and alcohol abuse (Indian Human Development Survey (IHDS-II) conducted in 2011–2012). Aside from NCDs and other chronic factors, India's aging population also suffers from several other impairments such as visual, hearing, and cognitive, further impacting the quality of life. A collaborative study by the Indian Council for Medical Research (ICMR) involving seven medical centres was conducted in 1997 with 60,000 individuals, which showed that blindness in aged Indians was 10 times more prevalent than the general population, both in rural and urban areas. According to a 1986-89 survey across 15 India states, blindness in aged people (over 50) has reduced from 9.8 % to the current rate of 8.5 %. However, thanks to several government programmes, recent research surveys demonstrate that India has successfully reduced the increase in blindness amongst the elderly (Murthy, 2005). According to the National Sample Survey Organization in 2003, an estimated that 3.4 % of the elderly population has both speech and hearing disabilities (Rout, 2010).

In addition to blindness, speech, and hearing disabilities, another potentially critical and prevalent NCD among the aging population are mental disorders. A rise in mental illness and substance abuse from 2.8 % to 4 % was observed in the elderly population between 1990 to 2003 (Institute for Health Metrics and Evaluation 2014). Regarding mental disorders/illnesses, social stigmas increase the problem in India (and elsewhere it has to be said). According to Reddy et al. 2013, approx. 27 % of the elderly in South India suffer from dementia, alcohol dependence, bipolar disorder, and depression. India's National Survey Data in rural areas demonstrates a significant positive correlation between mental disorders and aging (Lakhan and Ekundayo 2015).

Another issue less taken on and discussed is physical activity among the elderly. Over 69 % of the population over 45 took no physical exercise at all, as recorded by the LASI pilot study, conducted in 2010. The absence of physical activity in daily routine is common in the elderly, women being more sedentary than men (Arokiasamy 2012). Anthropometric data recorded in the LASI pilot study shows 29 % of females had a body mass index (BMI) over 25 compared to 20 % of males. Median systolic pressure was found to be 130, and median diastolic reading was found to be 83, both indicating pre-hypersensitive condition. One in every three participants had proper hypertension and were oblivious of their condition till that time (Bloom et al. 2014). 15 % of 5,400 diabetic individuals were similarly unaware of their disease, as with 33 % of 7200 hypertension patients, in a cross-sectional study made in 2009-2010 across ten Indian states (Joshi et al. 2012).

The aging process, NCDs, combined with a lack of exercise, also causes changes in the cell-mediated and humoral immune system, which significantly increases vulnerability to the infections such as pneumonia, tuberculosis, and other respiratory infections, particular regarding the Indian elderly. COVID can be seen as a potential example, in which the elderly are far more prone to being infected than younger Indians (Mueller 2020). For tropical countries like India, tuberculosis remains a morbid problem especially for people of the lower socioeconomic strata and the elderly (Patra et al. 2013).

With all these problems caused by aging looming amongst the Indian elderly, it is most dispiriting to observe that many more women face the negative impacts of age-related social issues than men. Widowed women, for instance, suffer social and economic deprivation for more than non-widowed elderly women. Census data shows women outliving their spouses (Desai et al. 2015). Another reason, a large number of women like to live with their wards (NSSO Report 1991) rather than living alone. Low literacy level is also a factor here, due to the favouring of sons over daughters regarding property inheritance with the result that female widows are especially economically vulnerable. Regardless of marital status gender issues in aging disadvantaging the female has to be addressed in the future.

Future directions: How can India create innovative policy both for the aged population and aging research?

Various programs and policies have been adopted by the Government of India (GoI), directly and indirectly, aiding the aging population and most of them have, thus far, met with substantial success. India's Ministry of Social Justice and Empowerment enforced the Integrated Programme for Older Persons (IPOP) in 1992 after United Nations General Assembly (UNGA) assumed the United Nations' Principles for Older Persons, which endorses nations to assimilate principles of freedom, self-respect, self-contentment, care, and participation in their schemes and national strategies. GoI provides financial support to NGOs, local rural government (Panchayati Raj), etc., to maintain geriatric shelters and clinics under IPOP Scheme (Agarwal et al. 2016).

The National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke (NPCDCS), is a government-sponsored detection and intervention program inaugurated in 2008 in Karnataka (one of the Indian states) and set

to expand in 10 other Indian states according to the GoI (Government of India Press Information Bureau 2010). Health care assistance also needs to be made available to the elderly in remote areas. Existing and novel technologies such as «telehealth» call or the m-health model may be of value in making healthcare accessible to elderly people residing in remote and rural areas. Walkers, hearing aids, reading glasses and magnifiers, and grab bars are cost-effective and readily available technology that could be provided for the elderly by the government at a subsidized rate. The promotion of the elderly-friendly infrastructure started by Kolkata, New Delhi, Udaipur, as part of the WHO Age-friendly Global Network (Sinha 2012, World Health Organization Centre for Health Development 2015), to design inclusive, effective urban spaces easily accessible by the elderly should be carried out mandatorily in the metropolitan cities to deal with the everyday mobility challenges the elderly face.

The Global Strategy and Action Plan on Ageing was declared by the World Health Organization (WHO) in 2015. As a result, 2020-2030 has been declared the decade of healthy aging. Since then, several related programmes and activities have been started, and existing ones are trying to align with the GoI and ameliorate the welfare of the aging Indian population (WHO, 2016). An action plan by GoI may involve early detection and management of NCDs.
Along with creating policies, the GoI also funds various research laboratories studying the complex mechanism's of human aging Many research groups are currently investigating the aging process in India, and thus Indian scientists have contributed immensely to the field of longevity.

The Gene Regulation Theory of Aging proposed by Prof. Madhu Sudan Kanungo (Kanungo 1975, 1980, 1994; Kanungo et al. 1997) postulates that aging occurs due to the changes in gene expression after attainment of reproductive abilities in adulthood. Sudan focused on the expression of enzymes lactate dehydrogenase (LDH) and alanine aminotransferase (AAT) and discovered that M4-LDH isoform to be less in the heart, brain, and skeletal muscle of old mice, making them more susceptible to Oxygen deprivation. He and his team found that many transcription factors and enzymes that help in metabolism are downregulated upon attaining maturity, for example, lack of presence of A isoform of cytosolic AAT in aged rats. These changes affect the metabolism of alanine, an amino acid, and alpha-ketoglutarate, which in turn alters Kreb's Cycle in the cell.

Prof. Kanungo was an active member of the National Council for Older Persons (N. C. O. P.) of Govt. of India, Ministry of Social Justice & Empowerment from 1999–2011, which initiated the National Initiative for Care of Elderly (NICE) policy. He founded the Association of Gerontology of India which focused on three tenets of aging: biological, socio-psychological and medical research. He was a pioneer in the field of Indian gerontological studies and made several notable publications in the field of Biology of Aging and published two books: ‹Biochemistry of Ageing› (Academic Press, U. K., 1980; translated into Russian) and ‹Genes and Aging› (Cambridge Univ. Press, U. K., 1994). His group is internationally known and still very active.

As proposed by Prof. K Subba Rao from the University of Hyderabad, India, the DNA Damage and Repair theory states that decreased DNA repair in the brain and nervous system is one of the leading causes of aging (Rao 1997, 1998). Ashok and Ali's group is studying the free radical damage to the DNA in the aging process that changes the DNA's antigenicity and elicits an immune response to ROS-DNA (Reactive Oxidative Species), and how the antibodies so formed are cross-reactive to the original DNA (Ashok 2013).
Dr. Gettanjali Chawla discusses interventions such as dietary restriction (DR) and collaborative efforts between India and other countries to discover underlying mechanisms of aging (Chawla 2019).

In June 2018, due to the findings of LASI, the greatest longitudinal study on aging ever carried out in India, Prime Minister Narendra Modi inaugurated the National Aging Centre at the All-India Institute Of Medical Sciences (AIIMS), in New Delhi in June 2018 (The Asian Age 2018). The National Centre for Aging, along with the other aging research labs, some of which have been mentioned above, can take aging research on to even greater success.

In addition to government policies, a new wave of awareness about the aging process has taken place. Older people are more likely to take care of themselves than ever before with the help of smart technology such as smartwatches, tracking cameras, home-use medical devices (fitness weighing scales, digital blood pressure monitors, glucose monitor, etc.) (Stavropoulos et al. 2020). The Indian market has experienced a massive influx of these products over the last few years and is set to continue increasing in the future (IDC India 2020).

Conclusion

India can be a key player in understanding the underlying mechanisms of aging because studying the vast diversity in the gene pool of Indians may hold the key in discovering just how the human being ages. Collaborative research between various countries, increasing funding in aging research, educating the

masses on the multitude of problems that arrive with the onset of senescence will help the rapidly aging population of India to overcome this by learning to benefit from the design of effective interventions. India already has taken several steps to aid healthy aging in all potential directions; but these impacts still must be tracked over a longer time periods. Smart technologies also enable people to keep an eye on their aging process and take preventive steps long since prescribed at the heart of ancient Indian tradition, such as exercise, a balanced diet, meditation, and yoga.

ABSTRACT:

FORSCHUNG ZU ALTERUNG UND LEBENSERWARTUNG IN INDIEN: GESCHICHTE, GEGENWART UND ZUKUNFT

Das Streben nach Langlebigkeit und andere relevante existenzielle Fragen haben die Menschheit seit jeher beschäftigt. Im indischen Subkontinent sind seit den Anfängen der menschlichen Zivilisation solche Fragen immer wieder aufgetaucht. Der Einsatz von Wissenschaft und Technologie hat heute ein klares Verständnis für Indiens alternde Demografie ermöglicht. Ein solches Verständnis und Wissen ist für Wissenschaftler und Langlebigkeitsforscher existenziell, um das Feld der Alternsforschung als Ganzes zu gestalten. Indien, bekannt für seine vielfältigen Sprachen, Religionen, Kulturen usw., ist ein multiethnisches Land. Es bietet somit eine einzigartige, facettenreiche Perspektive auf eine der herausforderndsten Fragen der Menschheit; nämlich das menschliche Altern.

Keywords: Ayurveda, Demografie, Zukunft, Gesundheitswesen, Indien, Langlebigkeit

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DER SINO-INDISCHE KOMPLEX

Mit den Grenzgefechten zwischen China und Indien im tibetischen Hochgebirge wurde die Welt daran erinnert, wie spannungsgeladen die Beziehungen zwischen Neu-Delhi und Peking sind. Verschlechterungen der sino-indischen Beziehungen können das weltweite geopolitische Gefüge nachhaltig verändern. Was sind die Implikationen für die Weltpolitik, wenn China und Indien auseinanderdriften? Eine geostrategische Standortbestimmung.

Keywords: China, Indien, Diplomatie, Geostrategie, Energieressourcen, Multilateralismus

Remo Reginold

Das asiatische Erwachen

Seit ungefähr 2013 haben sich die Beziehungen zwischen China und Indien merklich verschlechtert. Es fanden mehrere Scharmützel entlang der sino-indischen Grenze und der *Line of Actual Control* (LAC) auf über 5000 m ü. M. in unwirtlichen Territorien statt (vgl. Abb. 1). Diese Auseinandersetzungen erfuhren ihren Höhepunkt beim Zwischenfall im Galwan Tal in Ladakh Mitte Juni 2020. Mit 20 toten indischen Soldaten und nicht kommunizierten Opfern auf chinesischer Seite ist dieser militärische Vorfall der aktuelle Höhepunkt historisch komplexer Beziehungen. Die Zwischenfälle sind Ausdruck politischer Nervosität.

Einer der vordergründigen Aspekte dieser Eskalation ist, nebst Sicherung von Wasserressourcen und Quellen im tibetischen Hochplateau, das Kräftemessen um die regionale Vormachtstellung in Asien. Mit dem Verschieben des ökonomischen Zentrums nach Osten haben die Regionalmächte China und Indien an Selbstbewusstsein gewonnen und machen zunehmend geopolitische Ambitionen geltend. Unter der Führung des chinesischen Präsidenten Xi Jinping verfolgt China seine Pläne äusserst strategisch und schafft sich damit weltpolitisch günstige Ausgangsbedingungen. Durch geopolitische Initiativen wie der *Belt-and-Road-Initiative* (BRI) und der Schaffung der *Asian Infrastructure and Investment Bank* (AIIB) werden nicht nur Infrastrukturen und Finanzinstrumente geschaffen, sondern geostrategische Ziele verfolgt (Reginold 2018). Dabei werden zunehmend kulturelle, historische, aber auch juristische Elemente für die Sicherung dieser Ziele eingesetzt. Die *versteckten Seidenstrassen* (Reginold 2020) sind dabei ein gutes Beispiel. Auf indischer Seite gibt es weder erkennbare Ambitionen noch vergleichbare Strategien. Der wirtschaftliche Aufschwung der letzten Jahrzehnte hat in Neu-Delhi nicht dazu geführt, dass eine proaktive aussen- und sicherheitspolitische Agenda formuliert wurde. Indien scheint vielmehr reaktiv auf diese neuen Bedingungen zu antworten. Die langjährige Non-Alignment-Politik und die damit verbundene strategische Autonomie ändern sich erst seit einigen Jahren hin zu einer Politik des Multilateralismus und regionalen Ausbalancierungsstrategien. Die *Act East Strategy*, ein Versuch, die ASEAN-Staaten für sich zu gewinnen, aber auch die Allianzen mit Nachbarstaaten (*neighborhood first policy*) sowie dem *Quadrilateral Security Dialogue* (QUAD) mit Australien, Japan und den USA sind Zeichen dieses verzögerten Erwachens.

Es scheint offensichtlich, dass die Grenzkonflikte im tibetischen Hochgebirge eine militärische Übersetzung dieses politischen Kräftemessens sind. In Erinnerung an den kurzen sino-indischen Krieg von 1962 wird in Analystenkreisen gerne der historische Vergleich gezogen, dass China schon damals Indien in die Schranken weisen und so seine regionale Vormachtstellung demonstrieren wollte. Dieses machtpolitische Gerangel ist aber nur gerade die offensichtlichste Ebene von zwei starken Administrationen, welche die historisch komplexen Beziehungen neu befeuern.

Die ökonomische Variable

Seit den 1980er Jahren haben die beiden Länder versucht, ihre Beziehungen zu verbessern. Vornehmlich wurden die wirtschaftlichen Beziehungen intensiviert. Die ökonomischen Verstrickungen lassen aber nicht darüber hinwegtäuschen, dass die politischen Beziehungen nie wirklich und nachhaltig entwickelt wurden. Im Bereich Kultur- und Wissenschaftsdiplomatie wurden kaum Anstrengungen unternommen, die menschliche Mobilität ist nach wie vor gering, und so beäugen sich die Bevölkerungen beider Länder mit grossem Vorbehalt und Vorurteilen. Gerade in der indischen Gesellschaft werden die Beziehungen zu Peking durch die Brille des Krieges von 1962 gelesen und entsprechend schaut man mit gemischten Gefühlen dem Aufstieg Chinas entgegen. Diese Vorbehalte können die politischen Eliten nicht ignorieren. Entsprechend folgten nach den Auseinandersetzungen entlang der LAC in Indien die Bannung von chinesischen Produkten und Applikationen sowie die Kontrolle chinesischer Direktinvestitionen. Das sind

populärpolitische und rhetorische Massnahmen des indischen Ministerpräsidenten Narendra Modi. Die Handelsbilanz zeigt, dass Indien ein grosses Handelsdefizit gegenüber China aufweist. Bei Indien sind es nur gerade 5 Prozent des gesamten Exports, der nach China geht, und im Gegenzug hat China mit 14 Prozent den grössten Anteil am indischen Import (Kapoor 2020). Nebst Industrie- und Technologiegütern sind vor allem Energie- und Infrastrukturprodukte, aber auch pharmazeutische Ingredienzen für die indische Pharmaindustrie die wichtigsten Importgüter (Sidhartha 2020). Damit hat Modis kämpferische Ansage wenig bis kaum Effekte auf die Handelsbeziehungen. Zunehmend werden indische Tech-Startups und Energieunternehmen von chinesischen Fonds finanziert, die der Importkontrolle entfallen, da die Gelder vornehmlich via Singapur oder Mauritius einfliessen. Die diplomatische Note, welche Peking im Frühling 2020 bei der WTO gegenüber Indiens Kapitalkontrolle einlegte, ist demzufolge auch als populärpolitische Gegenaktion zu werten. Folgerichtig ist Modis «*Make in India*»-Strategie, mit dem Ziel, ausländische Abhängigkeiten abzubauen, mittelfristig für Neu-Delhi in Bezug auf China keine Option. Indiens wirtschaftlicher Aufschwung würde ohne den Support der chinesischen Volkswirtschaft nicht funktionieren. Darum war es mehr als nur klar, dass Neu-Delhi sich hütete, China für das COVID-19 Virus verantwortlich zu machen.

Rohstoffabhängigkeiten – die andere ökonomische Variable

Ein unbekanntes Element in der ökonomischen Variablen ist die Sicherstellung von Rohstoffen, insbesondere für die Energiegewinnung. Inwiefern diese Rohstoffthemen die sino-indischen Beziehungen beeinflussen werden, ist schwierig auszumachen. Beide Nationen gehören nebst den USA zu den weltweit grössten Konsumenten von fossiler Energie und sind abhängig von ausländischen Importen (Babajide 2018). Indien ist bei den Rohölimporten fast ausschliesslich von OPEC-Staaten aus dem Mittleren Osten abhängig. Das Fehlen von Rohstoffen oder das ineffiziente Ausbeuten von inländischen Ressourcen wie Kohle treibt Neu-Delhi in ausländische Abhängigkeiten (Babajide 2018). In dieser Gleichung kann China ein wichtiger geostrategischer Faktor sein. Es scheint, dass China seine Ressourcen besser zu sichern versucht. Peking ist für die enorme Energienachfrage ebenfalls von ausländischen Importen abhängig (Chunrong 2016). Die Chinesen weisen ein ähnliches Importportfolio wie Indien auf. Durch die BRI, der Beteiligung an Hafeninfrastrukturen, sowie mit dem Aufbau von militärischen Basen in Djibouti, Gwadar (Pakistan) und im südchinesischen Meer können sie den Import jedoch besser absichern. Zudem versuchen sie im Inland, im südchinesischen Meer, im Pazifik und in der Arktis nach neuen fossilen Quellen zu forschen und werfen dafür viel Geld auf (Reginold 2020). Diese Optionen fehlen Indien. Mit dem *China-Pakistan Economic-Corridor* (CPEC) hat China zudem die politischen Beziehungen zu Pakistan und die entsprechenden Infrastrukturen verstärkt. So ist es für Indien schwierig, regionale Ressourcen anzuzapfen und damit kurze und sichere Wege sicherzustellen. Exemplarisch dafür steht die *Turkmenistan-Afghanistan-Pakistan-India Pipeline* (TAPI); eine Gas-Pipeline, welche in den nächsten Jahren in Betrieb genommen und durch Pakistan geführt werden sollte (vgl. Asian Development Bank Projekt 52167-001). Damit wird die Transportsicherheit für Indien in Frage gestellt. Unter ähnlichen Vorzeichen steht die *India-Myanmar-Bangladesh Gas-Pipeline*. 2005 initiiert, ist sie bis heute nicht realisiert worden (Lama 2020). In der Zwischenzeit hat China seit 2013 mit der *Myanmar-China Crude Oil Pipeline* eine operativ funktionierende und laut der chinesischen Presseagentur *Xinhuanet* sichere Linie nach China. Diese Projekte kesseln Indien zunehmend ein. Was sind die Optionen?

Der strategische Outlook

Es ist mehr als nur augenfällig, dass dem sino-indischen Komplex eine zunehmend geostrategische Bedeutung beigemessen werden muss. Die ökonomische Variable und Direktinvestitionen werden mittelfristig nicht als Stabilisierungsfaktor dienen können. Es scheint, dass China auf eine sinozentrische Welt zusteuern und Indien sich an den Mustern des Multilateralismus orientieren will. Diese unterschiedlichen Agenden und strategischen Aussichten werden unweigerlich dazu führen, dass die beiden Nationen auf unterschiedlichen Ebenen und mit unterschiedlichen Themen aufeinanderprallen werden. Die Grenzkonflikte sind dabei nur gerade die offensichtlichste Kluft. Weitere diplomatische, ökonomische, aber auch juristische Verstimmungen werden folgen. Dass vermehrt offene Konflikte oder kriegerische Auseinandersetzungen zur China-Indien-Formel gehören werden, ist eher auszuschliessen. Diese Art von Auseinandersetzung können sich die beiden nuklearen Mächte langfristig nicht leisten.

Strategischer Pragmatismus

In China wie in Indien sind aktuell zwei starke Männer mit klaren politischen Zielen am Ruder. China will wieder seinen angestammten Platz in der Weltpolitik und Xi steuert innen- wie aussenpolitisch auf dieses Ziel hin. Modi wiederum sieht Indiens Zukunft als südasiatische Macht, die durch clevere Bündnispolitik mit südostasiatischen Staaten ein (maritimes) Gegengewicht zu China bilden soll. Die Bündnispolitik ist aber für Modi schwierig umzusetzen, da viele kleinere südasiatische und muslimisch geprägte Staaten Indien nicht zwingend wohlgesinnt sind und

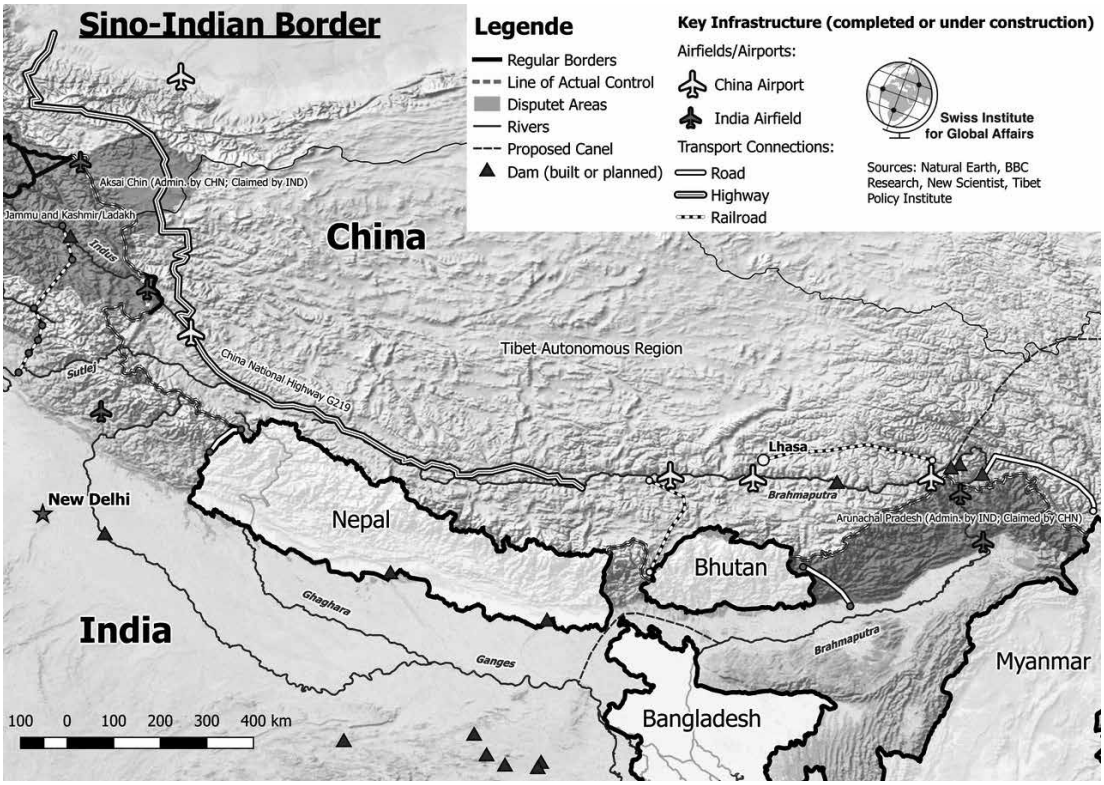

Abbildung 1: Line of Actual Control (SIGA Map Services)

vor der Rhetorik eines hinduistischen Grossindiens zurückschrecken.

Die sino-indischen Beziehungen müssen daher auf pragmatischem Kalkül basieren, wenn sie nicht konstant unter angespannten Bedingungen ihre Beziehungen pflegen wollen. Indien kann es sich nicht leisten, sich militärisch und ökonomisch gegen China aufzulehnen. In diesem Fall würde Neu-Delhi in regionale Isolation versinken. China kann die Muskeln gegenüber Indien auch nicht ohne Weiteres ausspielen, da dies die Kritik an Chinas *Wolf Warrior Diplomacy* – die westliche Betonung von Chinas aggressiver Rhetorik – nur unterstreichen und Signalwirkung auf kleinere Staaten in der Region haben würde. Dass während der aktuellen Grenzkonflikte die Keule der politischen Rhetorik geschwungen wurde, nicht aber die diplomatischen Beziehungen in Frage gestellt wurden, ist ein Zeichen dieses Pragmatismus.

Asiatischer Multilateralismus

Ausserdem können situativ sino-indische Kooperationen auf internationaler Ebene Vorteile mit sich bringen. So haben China und Indien am *9. BRICS Summit* in Xiamen (China) beschlossen, die gemeinsame Antiterror-Arbeit zu verstärken. Den Bemühungen folgte ein gemeinsames Statement, dass die islamistischen und in Pakistan beheimateten Gruppen *Lashkar-e-Taiba* (LeT) und *Jaish-e Mohammed* (JeM) als Terrororganisation einzustufen sind (Chand 2017). Dies ist insofern interessant, als China im UN-Sicherheitsrat lange dagegen opponierte. Als Mitgründer und Mitglieder der *New Development Bank*, aber auch über die Plattform der *Shanghai Cooperation Organisation* (SCO) haben sie zudem weitere asiatische Foren, wo sie sich pragmatisch auf gemeinsame Ziele einigen können. Indiens Mitgliedschaft bei der AIIB mit einem Anteil von 7,6 Prozent (vgl. zweitgrösster Anteilseigner nach China) könnte durchaus situativ zu Win-win-Opportunitäten führen. Indiens Aspiration auf einen permanenten Sitz bei den Vereinigten Nationen wird Neu-Dehli nur mit Pekings Unterstützung schaffen.

Die Zukunft des asiatischen Zeitalters wird nebst geostrategischen Überlegungen auch von innen- und soziopolitischen Entwicklungen geprägt sein. Zunehmende gesellschaftliche Mobilität, eine wachsende Mittelschicht, aber auch Nationalismen und religiöse Radikalisierungen können für aussenpolitische Zwecke eingesetzt und übersetzt werden. Xi sowie Modi scheinen diese Optionen in ihr strategisches Kalkül miteinzubauen. Die Sichtweise, dass Indien als Demokratie ein liberales Bollwerk gegen das kommunistische China sei, ist eine durch und durch westliche und eindimensionale Sicht. Die beiden bevölkerungsreichsten Nationen der Welt mit unterschiedlichsten Ethnien, Religionen und historischen Referenzen kann man nicht alleine auf eine geopolitische Formel reduzieren.

ABSTRACT:
THE SINO-INDIAN COMPLEX

With the border conflicts between China and India in the Tibetan Plateau, the world has been reminded of how tense relations are between New Delhi and Beijing. Deterioration in Sino-Indian relations can permanently alter the global geopolitical fabric. What are the implications for world politics if China and India drift apart? A geostrategic assessment.

Keywords: China, India, diplomacy, geostrategy, energy resources, multilateralism

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THE IMPACT OF COMMERCIAL SURROGACY ON WOMEN IN INDIA AND THE CHANGING PARADIGM TOWARDS ALTRUISM

Commercial surrogacy markets have advanced and moved globally in line with patterns of inequalities. India was one such country that experienced a commercial surrogacy boom until several exploitative factors led to ban proposals resulting in the Surrogacy (Regulation) Bill in 2019. This paper examines the experience of surrogate mothers in Western India and the impact it left on their post-surrogacy lives in monetary, health and emotional terms. 45 surrogate mothers were interviewed in 2018. The study revealed that the poor households had to do at least 2 surrogacies to emerge from poverty. The other poor remained poor, some of whom slipped even deeper into poverty. The physical impacts of surrogacy on the women's bodies were multiple. The emotional impact of surrogacy on women and their family members were also manifold. These detrimental impacts will remain even after changing the law in India to permitting only altruistic surrogacy.

Keywords: Commercial surrogacy in India, health and emotional impact of commercial surrogacy, poverty

Sheela Suryanarayanan

Surrogacy in India

As recently as September 2015 the Indian government announced a ban on commercial surrogacy, permitting only altruistic surrogacy. The regulation came about due to evidence of the deaths of surrogate mothers and egg donors, custody battles and the abandonment of children, exploitation of women and trafficking. Women in India were opting for surrogacy as a ‹distress sale› of labour for survival needs and in the hope of being able to rise out of the vicious circle of poverty. Intended parents were attracted to India mainly because commercial surrogacy was legal and the surrogate mothers had far fewer rights and control over their body, the actual surrogacy procedure and its remuneration. Moreover, unethical practices were thriving, providing opportunity for people to evade the law also (however, this landed several intended parents with legal battles for the custody of their children). All in all India had been a popular destination for commercial surrogacy. Some reports estimated the percentage of foreigners seeking surrogacy in India to be approximately 60–80 % (Frontline 2016), other studies found that the greater majority (60 %) of couples seeking commercial surrogacy came from abroad (Saravanan 2018). In this study, 57 percent of the commissioning parents came from abroad but included 16 percent Non-Resident Indians (NRIs). The Rajya Sabha Committee formed to review the Surrogacy (Regulation) Bill recommended NRIs be allowed to do altruistic surrogacy in India (Rajya Sabha 2020). The Bill has been delayed as one of the recommendations for the Assisted Reproductive Technology (ART) Bill is to be introduced before the Surrogacy (Regulation) Bill 2019. The reasoning behind it being that certain regulations regarding technical matters such as the storage of embryos, gametes could be addressed in the ART Bill.

Previous studies have found that most surrogate mothers were from poor households and were in dire need of money when they became involved in surrogacy (Pande 2010; Rozée et al. 2020; SAMA 2012; Saravanan 2018). Pande (2014) noted in her study that many women repeated surrogacy when the money ran out. The health impact of surrogacy on women's bodies is known to be detrimental. A recent study revealed higher obstetric complications, a higher likelihood of caesarean section, the development of gestational diabetes, hypertension, and placenta previa and a higher use of amniocentesis and the requirement of antibiotics during labour in surrogate pregnancies, compared with non-surrogacy pregnancies of the same women (Woo et al. 2017). Previous studies have also found that surrogate mothers became more depressed compared to non-surrogate mothers in India, both during their pregnancy and after childbirth (Lamba 2018). Other studies found that the social stigma and strict rules of surrogate hostels, and the absence of any relationship with the intended parents caused long-term psychological impacts on surrogate mothers and all that in return for very short-term monetary gains (Lamba 2018; Nayak

2014). However, Pande (2010) has noted that the surrogate hostel can be a space for resistance and that women can form sisterhood bonding within them.

This paper takes the household level of poverty as a primary indicator and examines the post-surrogacy impact; physical, financial, and emotional, on surrogate mothers and their families. In 2018, semi-structured interviews were conducted with 45 surrogate mothers in Western India who had completed a total of 63 surrogacies. The questionnaire was formulated and translated into the local language, consent was taken before the interviews in written or oral form and their anonymity has been maintained throughout the research.

Surrogacy maintained the vicious circle of poverty

Monetary gains were the primary motive for all the 45 surrogate mothers. For a majority (76 percent) of the women (34/45), surrogacy was a ‹distress sale› of labour to meet basic survival needs in the hope of escaping poverty. Hence any notion of their agency in this process can largely be ruled out. The study here categorised the, poverty level of the surrogate mothers as; ‹very poor›, ‹poor› and ‹sustainable› households. The ‹sustainable› households refers to land or house owners with a consistent flow of income, ‹poor› households were those with a consistent flow of money but no house or land ownership while ‹very poor› had neither a consistent flow of income nor land or house ownership. The immediate impact of surrogacy was a sudden influx of money, however, after 5 years, most that is to say (8/12) two-thirds of the ‹very poor› families slipped deeper into poverty. Only the four women who repeated surrogacy from ‹very poor› households were able to become sustainable in terms of income. Yet overall, only approximately one-third of the surrogate mothers (17/45) repeated surrogacy. The reasons given by the women for not repeating surrogacy were that surrogacy had reduced their physical capacity for work and that the process itself had been both physically painful and emotionally draining. Two-thirds of the ‹poor› households gained upward mobility into stabilising their monetary situation, while one-third slipped into deeper poverty. It was largely the sustainable households that became richer with surrogacy.

Adverse Health Impact

All the women stated that their capacity to work had reduced drastically post-surrogacy. Few surrogate mothers, 6 (13 %) had completed more than 12 years of education and most women had been working in the labour-intensive informal sector. For them, not having the capacities for work they had had before surrogacy resulted in a reduction in income and loss of livelihood. The multiple physical impacts of surrogacy on the women's bodies ranged from the pain caused by the hormone injections, to diseases developed post-surrogacy, the removal of the uterus and near-death experiences. Surrogate mothers in this study faced various forms of obstetric complications specific exclusively to their surrogacy pregnancies, as discovered in previous studies (Woo et al. 2017).

All the surrogate mothers described the physical pain of the hormone injections and how the pain continued even years after the surrogacy. Post-surrogacy, some surrogate mothers had developed diabetes, blood pressure problems, HIV, thyroid, also cancer. One surrogate mother faced near-death complications after an in-utero selective abortion. A few surrogate mothers experienced haemorrhaging and the necessity for the complete removal of their uterus. Another surrogate mother experienced a fistula in her own pregnancy afterward. In all the feeling was that bodies had been exploited in the surrogacy process.

Emotionally painful

The emotional impact of surrogacy on women and their family members were manifold. Surrogate mothers described, for instance, the depression experienced in the surrogate hostels caused by separation from their family members, how they witnessed the death and near-death situations of co-surrogate mothers in the hostel. Furthermore they talked of the degree of sadness and yearning they continue to feel deeply wishing to know of the well-being and whereabouts of the surrogacy children and feeling of isolation from the intended parents, and medical practitioners as well as from the co-surrogate mothers. An overall 62 % of the surrogate mothers declared that they felt sad, nervous, or depressed post-surrogacy either frequently or extremely frequently.

In addition, this study also found that the surrogacy impacted the surrogate mother's children and family. Gracy's son was 4-years-old when she went into surrogacy and thinks till today that his mother gave away the children because she was unable to take care of them. Other children felt their mother was exploited. Some of the ‹poor› and ‹very poor› husbands regretted sending their wives into surrogacy upon witnessing such physical and emotional pain for a mere short-term economic gain, but most found justification for it.

Conclusion

The study found multiple physical impacts of surrogacy on women's bodies and the emotional impact of surrogacy on women and their family members was manifold. Post-surrogacy, the poor remained poor and many slipped deeper into poverty. Only those poor families who repeated surrogacy were able to gain upward mobility in their economic status. In all, the women felt exploited both during the

surrogacy process and post-surrogacy. Yet, the ‹poor› did apply some agency by refusing to repeat surrogacy despite falling deeper into poverty. Most sustainable families became rich after one surrogacy while the ‹poor› became ‹poorer›. In view of these findings, the future of altruistic surrogacy in India seems to be grim as these detrimental impacts will remain in spite of the changing law in India in permitting only altruistic surrogacy.

ABSTRACT:

DIE AUSWIRKUNGEN DER KOMMERZIELLEN LEIHMUTTERSCHAFT AUF FRAUEN IN INDIEN UND DER PARADIGMENWECHSEL ZUM ALTRUISMUS

Die Märkte für kommerzielle Leihmutterschaft haben sich weltweit in Einklang mit sozialer Ungleichheit entwickelt. Indien war ein solches Land, das einen Boom der kommerziellen Leihmutterschaft erlebte, bis mehrere ausbeuterische Faktoren zu Verbotsvorschlägen führten, die 2019 eingeführt wurden. Dieser Artikel untersucht die Erfahrungen von Leihmüttern in Westindien und die Auswirkungen auf ihr Leben nach der Leihmutterschaft in finanzieller, gesundheitlicher und emotionaler Hinsicht. 45 Leihmütter wurden im Jahr 2018 befragt. Die Studie zeigt, dass die armen Haushalte mindestens zwei Leihmutterschaften durchführen mussten, um aus der Armut herauszukommen. Einige rutschten sogar noch tiefer in die Armut ab. Die Auswirkungen der Leihmutterschaft auf Körper und Emotionen der Frauen und ihr soziales Umfeld waren nachteilig. Diese negativen Auswirkungen werden auch nach einer Gesetzesänderung in Indien, die nur noch altruistische Leihmutterschaft zulässt, bestehen bleiben.

Keywords: Altruistische Leihmutterschaft, Armut, Indien, Kommerzielle Leihmutterschaft, Gesundheit

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INDIENS GRIFF NACH DEN STERNEN?

Spätestens seit 2019, als die Landung der indischen Mondsonde «Vikram» wenige Minuten vor dem Aufsetzen scheiterte, wird das Weltraumprogramm des Landes kontrovers diskutiert. Dabei geht es vor allem um die Beweggründe dahinter. Gäbe es für Indien nicht «Wichtigeres» zu tun? Geht es um Wissenschaft und die Verbesserung der Bedingungen seiner Bevölkerung? Spielen Rivalitäten mit China eine Rolle? Soll das Programm Zukunftsmärkte erschliessen? Oder ist es narzisstischer Selbstzweck … und wie geht es weiter?

Keywords: China, Geopolitik, Indien, Post-Corona, Raumfahrt, Zukunftsmatrix

Von Daniel Stanislaus Martel

«Wir sind überzeugt, dass wir nur dann unser Land entwickeln und dessen internationale Position stärken, wenn wir die menschlichen und gesellschaftlichen Probleme mit moderner Technologie lösen.»[1] So äusserte sich Dr. Vikram Sarabhai, der Vater der indischen Raumfahrt 1969 anlässlich der Gründung der Indian Space Research Organization (ISRO).

Lockende Sterne auch für Indien

Historisch war Indien Hort einer reichen Technikgeschichte, darunter der Astronomie, welche das Abendland befruchtete (Chattopadhyaya 1989). Im Heute galt Indien lange als für jegliche Zukunft verlorenes Land. Schon vor 1947 wollten dessen Eliten dem durch westliche Hochtechnologie abhelfen (Bhagwati 2004). In den 1950ern wurde die Raumfahrt zur Verheissung (Clarke 1963). Erste Euphorien machten bald Ernüchterung Platz. Militärisch-utilitaristische Prioritäten und nicht Visionen und Suche nach Erkenntnis takteten ihren Fortschritt (Paul 1980). Ihre Geschichte lässt sich in sieben Abschnitte gliedern. Am Anfang war das Vortasten der UdSSR und der VSA von 1957 bis 1961. Im selben Jahr gründete der indische Physiker Dr. Vikram Sarabhai ein nationales Weltraumprogramm.[2] Zwischen 1961 und 1969 lieferten sich die beiden Supermächte ein Wettrennen zum Mond. 1963 stieg eine erste indische Rakete empor.

Auf die Euphorie folgte die Frage «Wozu eigentlich?» mit konkreten Anwendungen als Antwort. Von 1969 bis 1975 prägten Fernmelde- und Wettersatelliten die Aktualität. 1969 entstand die Indian Space Research Organization mit dem Ziel einer nationalen Infrastruktur im Weltraum. 1975 startete Indiens erster eigener Satellit Aryabhata mit Hilfe einer sowjetischen Rakete. Zwischen 1975 und 1989 wurde der Weltraum für die Nachrichtentechnik relevant. Nach Fehlschlägen folgte 1980 der erste entsprechende Satellit Rohini an Bord der ersten indischen Rakete. Seit 1983 überwacht das nationale Satellitensystem (INSAT) Anbauflächen. Als Nächstes folgten Raketen für präzise geostationäre Umlaufbahnen. In 36'000 Kilometern Höhe genau über dem Äquator bewegt sich der Satellit synchron zur Erdoberfläche, d. h., er befindet sich immer an derselben Stelle. Dies vereinfacht die Verbindungen.

Chancen ausserhalb der Erde

Das Ende des Kalten Krieges 1989 führte nicht zum «Ewigen Frieden», sondern der Erosion der staatlichen Autorität durch Private auch im Weltraum. Dadurch fielen bis 2010 die Preise für Satelliten und Raketenstarts, und selbst Länder wie Afghanistan und Bolivien leisteten sich diese. 1994 stieg die erste indische Grossrakete auf. Zusammen mit Russland wollte Indien sodann leistungsfähige Kryogen-Triebwerke entwickeln. Die VSA blockierten diesen Technologietransfer, doch erwies sich das Land bis 2001 als fähig, dies aus eigener Kraft zu verwirklichen. 2008 entdeckte dessen erste Mondsonde Wasser auf dem Erdtrabanten. Von den 11 Instrumenten stammten fünf aus Indien und sechs von Partnern, darunter der NASA und der ESA. Indien war nun ein vollwertiger Akteur. Ferner erkannte die ISRO, dass Starts für Andere Einnahmen generierten. Auch die Schweiz profitierte 2009 davon mit ihrem ersten Satelliten Swisscube.[3]

In einer kommunikativ und technologisch eins gewordenen Welt wurde zwischen 2010 und 2020 die Präsenz im Weltraum Alltag (Schmundt 2020). Die Vierte industrielle Revolution ermöglichte neuartige Missionen zu den Planeten. 2014 wurde Indien das erste Land, welches beim Initialversuch Erfolg mit einer Marssonde hatte. 2017 setzte es einen Rekord, indem es 104 Mikrosatelliten gleichzeitig absetzte.

Bis 2015 ging das regionale Ortungssystem Gagan nach dem Vorbild des amerikanischen GPS in Betrieb.

1 https://web.archive.org/web/20190627181445/https://www.prl.res.in/~library/sarabhai_v_speeches.pdf

2 https://www.indiaeducation.net/apexbodies/isro/milestones.aspx

3 https://archiveweb.epfl.ch/swisscube.epfl.ch/

Dabei deckte es ein Gebiet von 1500 Kilometern jenseits der indischen Grenzen ab. 2017 folgte der South Asia Satellite für Nachrichtenübertragung und medizinische Ferndiagnostik. Beide stehen den Nachbarländern zur Verfügung. 2019 setzte eine zweite Mondsonde einen Lander mit dem Mondauto «Vikram» ab. Wenige Augenblicke vor dem Aufsetzen brach der Kontakt ab. Es wäre die erste Ankunft beim lunaren Südpol geworden. Eine Ersatzmission ist für 2021 vorgesehen. Weitere Projekte betreffen die Sonne, die Venus, den Mars und den Jupiter. Indien nimmt dadurch die nächste, noch offene Etappe der Weltraumpräsenz ab 2020 vorweg (Olivari 2020). 2022 soll der erste Gaganaut starten. Vier Kandidaten werden derzeit bei Moskau ausgebildet.

In Entwicklung findet sich ferner eine «Billigrakete» für Minisatelliten. Eine weitere soll dank Modulen kostengünstiger sein. Ebenfalls in Planung ist eine für 60 Tonnen Nutzlast. Bis Ende 2019 beförderte die ISRO 328 Satelliten aus 33 Ländern in das All.[4] Militärische Absichten verfolgt sie offiziell keine. Die Streitkräfte haben ihr eigenes Programm (Kalam et al. 2006).

Irdische Machtpolitik im Weltraum

Das indische Weltraumprogramm wurde trotz seiner relativ bescheidenen Budgets im In- und Ausland stets kritisiert (Komireddi 2017). Es gäbe im Lande mehr als genug zu tun, etwa im Gesundheitswesen (Mundy 2018). Jeglicher Zusammenhang mit Rüstung und Prestigedenken wurde von Anfang an von den Verantwortlichen bestritten. Es diene der Entwicklung des Riesenlandes, insbesondere durch Fernmeldewesen und die Überwachung der Agrarflächen (Mukunth 2019).

Machtpolitik schimmert nichtdestotrotz durch. Dies zeigt sich in der Assoziation der Nachbarländer an seine Satellitendienste. Indien unterstreicht dadurch seinen regionalen Führungsanspruch. Dazu kommt der Wettlauf mit China (Rajagopalan 2020). Indiens Rivale war um 1950 nicht weiter entwickelt. Es stieg jedoch durch Disziplin, Härte und gezielte Emanzipation zur Regionalmacht auf, ehe ihm der Neoliberalismus die Industrialisierung ermöglichte (Emmott 2004). 1958 begann mit sowjetischer Hilfe dessen Weltraumprogramm. 1970 startete der erste Satellit, 2003 der erste bemannte Raumflug und 2007 die erste Mondsonde.[5] Seit der Jahrtausendwende widerspiegelte das indische Lunar- und Planetenprogramm das chinesische (Goswami et al. 2019). Sozusagen nebenbei demonstrierten beide Länder ihre Fähigkeit zur Zerstörung von Raumflugkörpern (Schmundt 2020). Abbildung 1 vergleicht die Weltraumaktivitäten der Protagonisten und setzt sie in Verbindung mit denjenigen der Supermächte.

Indien lernte von den Supermächten und wurde durch technologische Emanzipation autonom (Krugman et al. 1997). Das Rennen mit China ermutigte spektakuläre Erstleistungen analog zu denjenigen der Pioniere zwischen 1961 und 1969 (Jasani et al. 1985). In beiden Epochen trug nicht zuletzt der Ehrgeiz der Fachleute dazu bei. Den Machteliten kam dies gelegen, denn dadurch bewiesen die Spezialisten in ihrem Solde ihren Gegenübern ihre Überlegenheit bei hochkomplexen Aufgaben (Hennock 2008). Dies unterstreicht die High-Tech-Kompetenz des Landes, denn viele dieser Kapazitäten betreffen potenziell militärisch und machtpolitisch nutzbare Anwendungen. Solche für Frieden und Krieg anwendbare Mittel gelten als Dual-Use-Güter (Forge 2009). Dazu kommen Technologietransfer und Inspirationen für Unternehmer und dadurch Impulse für die wirtschaftliche Entwicklung (Speser 2006).

Wie weiter in einer möglicherweise neuen Welt?

Seit 2020 wandelt sich die Welt unter dem Einfluss von Corona. Beispiele sind die steigende Nachfrage nach Kommunikation oder der Rückgang der Mobilität. Beides beeinflusst Länder wie Indien oder China. Dazu verstärkte die Pandemie weltweit latente soziale Spannungen.[6] Szenarien zum indischen Raumprogramm müssen daher diese Zusammenhänge berücksichtigen (Blasche 2006). Im Detail geht es um die Rivalität Indiens mit China in der Nach-Corona-Welt und deren Auswirkungen auf die Präsenz im All. Die Wechselwirkungen zwischen Indien und China beruhen auf der Stärke beider Länder und den Prioritäten ihrer Eliten (Rajagopalan 2020). Jene werden von der übrigen Welt beeinflusst. Einer oder beide Protagonisten können die Expansionspolitik fortsetzen oder abschwächen, etwa im Zusammenhang mit Unruhen oder einer Rezession. Die Zukunftsmatrix zeigt die vier möglichen Zustände (Martel 2020) in Tabelle 1.

Die Rivalität Indien – China setzt sich je nach innerer und äusserer Lage beider Entitäten fort oder nicht. Im ersten Falle steigen die Spannungen in Kontinentalasien, im zweiten entschärft sich die Konfliktsituation. Dies hat Auswirkungen auf das indische Weltraumprogramm. Dabei geht es nicht um die Grundsatzfrage, ob das Land sich davon verabschiedet oder nicht. Die Verpflichtungen und Pfadabhängigkeiten (Krugman et al. 1997), aber auch der Nutzen sind zu gross, um es aufzugeben. Die Frage lautet daher, ob Indien sich zukünftig auf konkrete Anwendungen wie Fernmelde- oder Wettersatelliten konzentriert oder ob es weiterhin interplanetare Ambitionen hegt (Rajagopalan 2020). Tabelle 2 illustriert die Möglichkeiten.

4 https://www.isro.gov.in/sites/default/files/328_foreign_satellites.pdf

5 https://www.reuters.com/article/us-space-exploration-china-moon-timeline/timeline-major-milestones-in-chinese-space-exploration-idUSKBN2830LD

6 https://www.ipg-journal.de/regionen/asien/artikel/am-abgrund-4435/

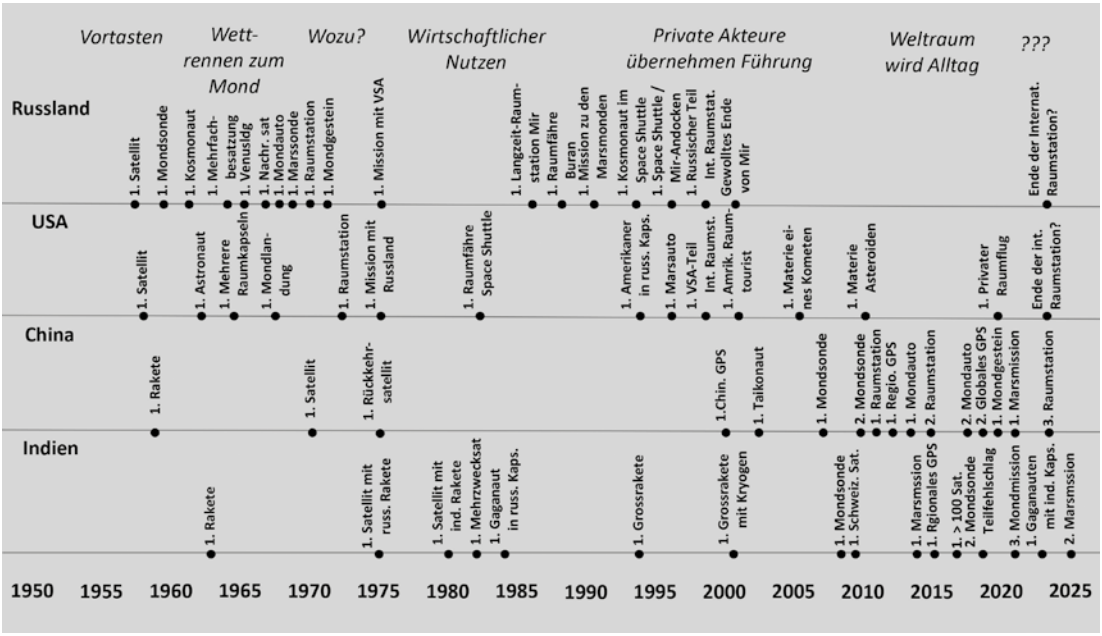

Abbildung 1: Ausgewählte Erstleistungen in der Raumfahrt – Rivalität und gegenseitiges Lernen (Quelle: Eigene Darstellung nach Launius 2018, Nair 2019)

		Expansionspolitik Indiens	
		Verringert sich	**Wird fortgesetzt**
Expansionspolitik Chinas	**Wird fortgesetzt**	Innere Probleme aller Art erschüttern Indien und erzwingen fundamentale Kurswechsel in Politik, Wirtschaft und Gesellschaft. China bleibt dynamisch, nutzt die Schwächen Indiens aus und überholt es. ***Indiens Stagnation***	Ungeachtet möglicher Erschütterungen und Einflüsse von aussen kann Indien an seinen politischen, wirtschaftlichen und technologischen Prioritäten festhalten. Dasselbe trifft auf China zu. In der Folge verschärft sich die Rivalität. ***Indiens Bewährung***
	Verringert sich	Indien und China sind innerlich und äusserlich durch Veränderungen in der Welt geschwächt. Prioritär versuchen sie, ihre darauf zurückzuführenden Blockaden zu überwinden. Die Spannungen nehmen ab. ***Indiens Entspannung***	Indien setzt seinen bisherigen wirtschaftlichen, politischen und internationalen Kurs mehr oder weniger fort. Indien konsolidiert seine Position. China gibt aus inneren und äusseren Gründen den Führungsanspruch auf. ***Indiens Aufstieg***

Tabelle 1: Rivalität Indien mit China nach der Corona-Krise (Quelle: Eigene Darstellung nach Goswami et al. 2019, Joehr 1987, Pti 2021)

		Indisches Weltraumprogramm	
		Nationale Ausrichtung	**Bilaterale Rivalität**
Chinesisches Weltraumprogramm	**Bilaterale Rivalität**	Ungeachtet der chinesischen Aktionen konzentriert sich Indien auf Nutzsatelliten und Dienstleistungen für Drittländer. Dadurch steigert es den volkswirtschaftlichen Nutzen des Programms. ***Indiens Stagnation***	Indien setzt (neben den Nutzanwendungen) seine Erstleistungen fort, mit dem Ziel, China zuvorzukommen und die Welt zu beeindrucken. China verhält sich analog und kann infolge höherer Ressourcen die Führung anstreben. ***Indiens Bewährung***
	Nationale Ausrichtung	Indien und China geben den Wettlauf auf und konzentrieren sich auf volkswirtschaftliche Anwendungen. Die Konkurrenz verringert sich und beide Programme werden weniger spektakulär. ***Indiens Entspannung***	Indien erkennt, dass China seiner sichtbaren Präsenz im Weltraum weniger Priorität einräumt, und setzt seine eigenen Erstleistungen fort oder steigert sie sogar. Indien zieht dadurch mit den Weltraummächten Russland, VSA und Europa gleich. ***Indiens Aufstieg***

Tabelle 2: Indiens zukünftige Präsenz im Weltraum (Quelle: Eigene Darstellung nach Hennock 2008, Komireddi 2017, Rajagopalan 2020)

Angesichts der angelaufenen Übergänge zur Nach-Corona-Welt, der regionalen und geopolitischen Rivalität zwischen Indien und China, aber auch der Vorinvestitionen sind verschiedene Fortführungen denkbar. Dabei können sowohl Indien wie auch China den Konkurrenzkampf um Erstleistungen zugunsten konkreter Nutzungen verringern oder nicht (Rajagopalan 2020). Die nachfolgenden vier idealtypischen Szenarien stellen Indiens Weltraumakivitäten den chinesischen gegenüber.

Indiens Stagnation: Ein von innen und/oder von aussen geschwächtes Indien wird von einem wirtschaftlich und innenpolitisch konsolidierten China bedrängt. Indien ist daher gezwungen, seine Weltraumambitionen zu reduzieren. Deshalb konzentriert es sich auf Anwendungen, welche seiner Volkswirtschaft und seinen Regionalambitionen Nutzen bringen, wie Fernmeldesatelliten.

Indiens Bewährung: Indien und China setzen beide ihren Expansionskurs fort. Dabei kommt es weiterhin zu Pioniertaten. Auf der indischen Seite verschlingt dies immer mehr Ressourcen, so dass der innenpolitische Druck zunimmt. Indien stärkt allerdings seinen Status als Weltraummacht und bietet sich auf dem Weltmarkt an.

Indiens Entspannung: Indien und China sind beide geschwächt und geben die Rivalität im Weltraum faktisch auf, setzen aber praktische Anwendungen wie Wetter- oder Fernsehsatelliten fort. Durch ihren weitgehenden Rückzug von ressourcenintensiven und risikoreichen Pionierleistungen konzentrieren sich beide auf wirtschaftliche Anwendungen der Weltraumtechnologie.

Indiens Aufstieg: Ein durch innere Spannungen und äusseren Druck geschwächtes China gibt einen Grossteil seiner Weltraumambitionen auf. Indien erkennt die Chance und setzt seine sichtbaren Erstleistungen fort. Dadurch konsolidiert es seinen Status als Weltraummacht, geht allerdings das Risiko wachsender innerer Unzufriedenheit infolge der «sinnlosen» Ausgaben ein.

Vielleicht unerwartete Zukünfte?

Das weitere Vordringen Indiens in den Weltraum wird sich zeigen. Das Land und sein Rivale könnten wie die übrige Welt durch neue Mutationen des Coronavirus oder Rezessionen und Unruhen erschüttert werden. Deshalb sind auch die möglichen Wechselwirkungen zwischen dem indischen Weltraumprogramm und den vorstellbaren Reaktionen der nach wie vor mehrheitlich armen Bevölkerung zu bewerten.

Indiens Stagnation: Die Reduktion des indischen Weltraumprogramms auf praktische Anwendungen infolge der Position der Schwäche des Landes gegenüber China wird von den ärmeren Bevölkerungsschichten mitgetragen. Dadurch entspannt sich der Subkontinent innenpolitisch.

Indiens Bewährung: Die stets beeindruckenderen Leistungen machen das Land zur Grossmacht, bringen aber Teile der Bevölkerung gegen ein Programm ohne gefühlten Nutzen auf. Inländische Erwartungen und Prioritäten der Regierung und Eliten driften auseinander mit zunehmenden Unruhen als Folge.

Indiens Entspannung: Der zumindest für Teile der Bevölkerung spürbare Nutzen der Weltraumaktivitäten nimmt dank des Wegfalls der spektakulären, aber teuren Erstleistungen zu. Indiens Kompetenz führt zu komparativen Vorteilen, so dass es zum Spezialisten für Weltraumdienstleistungen wird.

Indiens Aufstieg: Die ISRO lanciert infolge des Wegfalls des Konkurrenten spektakuläre Programme. Dadurch meistert das Land Dual-Use-Technologien und wird Machtzentrum und High-Tech-Partner. Die Bevölkerung dagegen fühlt sich vernachlässigt und politische Opposition wird wahrscheinlich.

Die Verknüpfung der vorstellbaren indischen Aktivitäten im All mit den durch jene hervorgerufenen möglichen Reaktionen der Bevölkerung zeigt fundamentale Herausforderungen für Indien. Regierung und Eliten müssen daher zwischen der allgemeinen nationalen Schwäche und der punktuellen globalen Stärke lavieren. Es ist daher vorstellbar, dass das Weltraumprogramm das Land letztendlich destabilisiert und blockiert. Nicht zu vergessen sind ferner die üblichen «bekannten Unbekannten» wie Technologiesprünge. Gesellschaftliche Umwälzungen wie die Stigmatisierung der Raumfahrt analog zur Luftreise sind ebenfalls zu bedenken (Wallace-Wells 2020).

Lange vor den heutigen Zweifeln fasste der indische Wissenschaftler Abdul Kalam die Motivationen hinter den indischen Vorstössen ins All zusammen: «Premier Nehru und Professor Sarabhai teilten beide die Vision eines Indien, welches dank moderner Technologie den ihm gebührenden Platz unter den Ländern einnimmt» (Kalam et al. 2006). Wie dies zu verstehen war und ist, darüber gehen die Ansichten auseinander – nicht nur in Indien.

ABSTRACT:
INDIA'S REACH FOR THE STARS?

The country's space program has been the subject of controversy since 2019 at the latest, when the landing of India's lunar probe «Vikram» failed a few minutes before touchdown. The main issue is the motives behind it. Wouldn't India have «more important things» to do? Is it about science and improving the conditions of its population? Do rivalries with China play a role? Is the program intended to open up future markets? Or is it a narcissistic end in itself ... and what happens next?

Keywords: china, geopolitics, India, post-corona, space, future matrix

Daniel Stanislaus Martel

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FUTURE. INDIA. DALIT

The Dalits present a paradox for understanding the future of India. Do they represent India or are absented from it? When scrutinized, present day «India» shows only a persistence of ignorance, perpetually propped up by an academic class too lazy, overwhelmed, and ill-equipped to cope with its social complexity. A slothful binary of India and the Dalit provides no base for future thinking. The Eurocentric, white Christian analysis reduces India to race and religion. This over-simplistic master narrative facilitates the ruling elite's continuing existence. India's future is in the eradication of all castes in the name of liberty, equality, and fraternity – wherein lies the rub – and much more, in a further paradox that can only terrify the current order of things.

Keywords: Unborn time, caste system, Eurocentric, the politics of ignorance, social complexity, nation, caste-annihilation

Anu Ramdas

‹Unborn time› feels like a good description for the ubiquitously used concept of the future, it is a definition-defying yet universally understood concept. The term future, and all that it connotes, is a product of human imagination, irrevocably tied to a temporal state that will always be unborn. As the future does not exist in time and space, no one demands tangible evidence of it, nonetheless a close reading of the present and the past is expected. Towards this, the human mind processes multitudes of factors to approximate a prediction of the immediate future. In a sense, prediction as a primordial survival skill is also one of the oldest transactional commodities used by humans from individuals to nations.

The nation, as a constructed idea, bundles many kinds of promises and penalties – *If you are a citizen, you will be protected. You will be provided for. Your rights and aspirations, that is, your present and future will be taken care of.*

These promise/penalty packages are contingent on people's belief in them. So, we must imagine the nation as a sales team, one that must constantly work on its spiel about the future to keep the populace convinced. How does such a sales team go about making a pitch for something that has no concrete evidence of its existence?

This must be done in two ways, promise a better future for the ones protesting the present and the past. And simultaneously promise the same future for the ones who are content with their present.

Those who are content with the present require the social structure to remain static and those resisting the existing social structure want it destroyed. Only one outcome is possible.

In the light of the above, let us examine the specific topic given to me for this series: ‹The future of India: The situation and possible futures of the Dalits›.

Why is the future of India or any nation significant? And why would the future of one subset of a nation's population be significant?

I will attempt to unpack the nature of the second question first. Why Dalits? Why not Adivasis, Pasmandas, Bahujan, Brahmins, Indian Christians, Parsis or any of the hundreds of social classes of India?

Two possibilities present themselves; the Dalits in some way are a representative class of all Indians and the nation. Or, the Dalits are *not* representative of Indians and India, therefore a special sociological lens is required with respect to their future alone.

What facts are at hand? The key terms are the future, Dalits, and India. Dalits are 16.6 % of the population of India. This is hardly informative, aside from the fact that 83.4 % of the population are unnamed and left to be assumed to be a homogenous social class oppositional to the Dalits. In this formulation and much of all academic and public discourse around the social structure of India, Indian society is split into these two classes. Dalits and the rest. The rest is never named or identified.

In this bifurcation, all semantic inferences rest on the terms India and Dalit. For any subset information to have meaning we would need some insights into all the subsets. More simply, we need a part-whole relationship. Perhaps, a proposal was made to ask every subset of the Indian population their situation and future and Dalit was just a random choice. This not being the case, one is forced

to wonder why Dalits were singled out for this exercise.

Taking it at face value, that there is academic or logical credibility in this formulation, let us see where it takes us. If 16.6 % of Indians are Dalits, who are the rest? Imagine not knowing this and having to look for all subsets of the population within the political boundaries of India. Is it so complex that the knowledge cannot be acquired as quick facts? Or is it too fearsome a prospect for academic inquiry? In the absence of the knowledge of who the others are, what exactly does the question of the future of the Dalit mean? The sum of past and present experiences points to differential outcomes for different classes of Indians. As this formulation posits only two social classes, Dalits and the rest, the obvious assumption is that the others' futures are secure.

Let us examine the other presupposition—Dalit. Who are they? Do they have a common ancestry or language or region? What is common to all Dalits? Perhaps, they practice some form of religion that is vulnerable and therefore their future calls for a global discourse.

This will not hold; Dalits practice numerous ways of worship, many of which have no mainstream equivalents. Their religious beliefs cannot be the reason for concern about their future or common experience. In fact, the poet Joopaka Subhadra says there is no word for religion in her language. Like all other Indians they speak different languages, live in different regions, have different political affiliations.
Quite clearly this question of Dalits and India along with their nested presuppositions emerges from a perception that there is some kind of persecution of Dalits. The origin and sustenance of this perception itself needs closer scrutiny. But for now, we will take it as being based on substantial evidence. How did 16.6 % of the population come to be a persecuted community? Why do they not mutiny against the rest? This would mean mutiny against India.

If the Dalit is the stand-in for the wronged, then India is the stand-in for the wrongdoer. Temporally, the present must be in a state of mutiny so that both the wronged and the wrongdoer have a just future.

Are Dalits a proxy for understanding the social structure of India? Are all nation states to be understood in this way? As illustrated above, this is flawed at a very fundamental level and yet we have these discourses.

I want to call this the politics of ignorance cultivated by the academic class.

It is apparent that there cannot be an honest and direct discourse on the social structure of India – the caste system, a supremacist order, for it implicates and isolates the ruling class/castes as the beneficiaries of this supremacist order. Furthermore, the Dalits are not the only community affected by the caste system, the Bahujan or the majority of the lower castes are also affected. But it has always been and remains the best strategy to separate the Dalits from the Bahujan and present them as the only affected entity. In so doing it compresses the horrendous system into a simplistic binary.

For the western scholar, caste has always been too much of a mess to study. An early reference to this recognized difficulty can be seen in the notes of the first census effort by the British colonizers:

«*In this manner it was designed to lay ‹a foundation for further research into the little-known subject of Caste,› a subject in inquiring into which investigators have been graveled, not for lack of matter, but from its abundance and complexity, and the lack of all rational arrangement. The subject as a whole has indeed been a mighty maze without a plan.*» Eustace J. Kitts, 1885

Western scholars need a ‹plan› that makes sense to their own contexts and realities. When attempting to deal with the ‹abundance of information about caste› they find themselves bereft of analytical tools. And they typically resort to default Eurocentric methods, putting diverse peoples, societies, and their histories into two neat buckets – race and religion. The center in the Eurocentric is white-Christianity. The rest of the world is absorbed into this highly restrictive master-narrative. As Kuffir repeatedly points out in his writings, this results in the non-white world getting organized into racial and religious categories even when neither make any sense. The Dalit becomes equivalent to the Blacks, racializing the Dalits as well as the discourse on the caste. Thus, propagating massive levels of ignorance, deliberate ignorance about people and an anti-social system that affects a billion humans. Kuffir and Aloysius argue that the western scholar's limitation of seeing the world through the lens of organized religion led the British colonizers of the subcontinent to imagine a common religion «Hinduism» sans evidence. Multitudes of diverse people including the Dalits and Adivasis are clubbed together into this religion with not even their awareness let alone consent. This religion with its inherent system of caste provides the ruling elites endless possibilities to control the masses and allows no change to the social structure.

Coming back to the promise of the future, which social classes can be invested in the status quo? The ones who are going to be born in the same castes at

the top of the caste pyramid with the same material, social and political advantages generation after generation that secures their position as the perpetual ruling class.

In his last speech to the Constituent Assembly, Dr Ambedkar expressed this, in 1949: «I am of the opinion that in believing that we are a nation, we are cherishing a great delusion. How can people divided into several thousands of castes be a nation? The sooner we realize that we are not as yet a nation in the social and psychological sense of the world, the better for us. For then only we shall realize the necessity of becoming a nation and seriously think of ways and means of realizing the goal. The realization of this goal is going to be very difficult far more difficult than it has been in the United States. The United States has no caste problem. In India there are castes. The castes are anti-national. In the first place because they bring about separation in social life. They are anti-national also because they generate jealousy and antipathy between caste and caste. But we must overcome all these difficulties if we wish to become a nation in reality. For fraternity can be a fact only when there is a nation. Without fraternity equality and liberty will be no deeper than coats of paint.» Seven decades on, the nation in reality did not materialize. Caste has prevailed. The idea of nation has become another tool that services the caste system and the ruling elites. The nation has become inseparable from the caste system.

For the majority who are oppressed by the caste system, this is unacceptable, caste must be annihilated for the Bahujan to be liberated. This is the only way equality can be imagined and achieved for all. To transcend caste, the Dalit's future is not a carrot to be dangled. The Dalit is like any individual anywhere in the world who imagines freedom, aspires for, and works for an equal world that centers the humanity of individuals.

The unborn time is always a promise. Promise for the better or worse and the usually unsaid truism – remains the same. The vantage point of the Dalits shows that the future is not going to change for the majority of the working classes – the Bahujan caught in the caste system. And since popular discourses are still hesitating to find the language to name caste, the politics of ignorance will ensure that annihilation of caste is not a future.

If there has to be a future that ensures dignity for all, then India's future is in its demise.

ABSTRACT:
ZUKUNFT. INDIEN. DALIT

Die Dalits stellen ein Paradoxon für das Verständnis der Zukunft Indiens dar. Repräsentieren sie Indien oder sind sie von ihm abwesend? Wenn man es genau betrachtet, zeigt das heutige «Indien» nur ein Fortbestehen der Ignoranz, aufrechterhalten von einer akademischen Klasse, die zu faul, überfordert und schlecht ausgerüstet ist, um mit der sozialen Komplexität des Landes umzugehen. Eine träge Binarität von Indien und den Dalit bietet keine Grundlage für zukünftiges Denken. Die eurozentrische, weisse christliche Analyse reduziert Indien auf Rasse und Religion. Diese allzu vereinfachende Meistererzählung erleichtert der herrschenden Elite die weitere Existenz. Indiens Zukunft liegt in der Ausrottung aller Kasten im Namen von Freiheit, Gleichheit und Brüderlichkeit – worin der Haken liegt – und noch viel mehr, in einem weiteren Paradoxon, das die gegenwärtige Ordnung der Dinge nur erschrecken kann.

Keywords: eurozentrisch, Kastensystem, Kastenvernichtung, Politik der Ignoranz, soziale Komplexität, ungeborene Zeit, Nation

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THE FUTURE OF WATER IN INDIA 2050

Evidence across India shows that the future of water is grim. This paper employs the DPSIR model to highlight how the demand for irrigation and urbanisation drives water stress. Furthermore, the paper investigates the role of inclusive communication and education, green finance, and technology as responses to minimize water stress. The reasons for the water stress faced in 2020 will remain pressingly relevant until 2050 and beyond. Fortunately for India, irrespective of the public or private sector, urban-rural base, or age bracket, forms of the above solutions are already embedded in daily practice. India must implement solutions in a smart, strategic manner before water scarcity washes out 6 % of the nation's GDP by 2050.

Keywords: water, irrigation, India, future, DPSIR framework

Saahil Waslekar

The warnings are clear. India is experiencing a water crisis. A population of 1.38 billion (2020), growing at 1 % annually, is bound to demand more water, food, energy, housing, and jobs. Such growth will dilate the gap between water demand and supply, affecting daily activities.

India is known to have the largest annual agricultural water withdrawal. The Council on Energy, Environment and Water (CEEW) (Chaturvedi et al. 2020) estimates water withdrawal to reach 1058 billion cubic meters (BCM) by 2050. According to the Food and Agriculture Organization (2016), India has 67 million hectares equipped for irrigation. Across the world, on average, 74 % of water withdrawals are for agricultural purposes. However, in 90 % (688 upon 761 BCM) of total groundwater draft is consumed by irrigation (Scheierling/Tréguer 2018). In fact, according to CEEW, estimated water withdrawal in 2010 was 949 BCM.

In 2011, average annual water availability per capita was 1545 cubic meters. The Government of India anticipates that by 2025 this number will be reduced to 1341 and further reduced to 1140 cubic meters by 2050. Jain et al. (2019), in 2013-14, recorded an ever-steady decline in canal and tank irrigated areas and an increase in dependence on groundwater for irrigation since 1950-51. During 2013-2015, the average net annual groundwater withdrawal was 253 BCM or 62 % of net-annual groundwater availability, carried by wells. Unfortunately, wells contribute to water contamination due to much deteriorated conditions.

Seventy-five BCM (equivalent to one-third of global extraction) of groundwater is extracted annually in India (Rajendran 2019). Evidence has shown a trail of subsidies, such as fertilizer, power, or export, favour groundwater extraction in certain provinces. Furthermore, mass production of water-guzzling cash crops and cheap bank loans to pump water has resulted in dry aquifers, increased salinity, arsenic toxicity, nitrate contaminants, causing immense health hazards. 82 % of rural households today, live without a piped water supply. Among farming communities, these dry water bodies result in high suicide rates or a rush to cities to find employment. However, cities and semi-urban centres have their own water scarcity issues. India's urban population is well over 33 % of the current population. It is projected that by 2050 India will have an additional 416 million urban residents. The pace of urbanization will further corrupt the quality of water, and conditions and access to water will increase societal and economic inequality.

In urban areas, water is required for domestic households, commercial, and industrial use. In urban India, as of 2017, 48 % of the urban water supply was provided by groundwater, however, only 47 % of urban households had individual water connections, and 70 % (44,000 million litres a day) of sewage water remained untreated. Provincial water boards regulate permissions, launch-halt water projects, but they lack the framework necessary to control urban groundwater extraction. The outcomes are daunting:

– urban poor receive 40 litres per capita per day (lpcd) of water as opposed to the 150 lpcd prescribed by municipal corporations. By 2050 India may be reduced to only 22 % of the present lpcd (Menon/Poti 2018).

– informal neighbourhoods (60 % of the national urban population) in Bengaluru receive two hours of water twice a week.

– in Mumbai, there are sections of society that pay 52 times the normal rate for public water (Du 2019).

– the core area of Kolkata lacks a sewage treatment plant. The generation daily of 750 million litres of wastewater and sewage means the Bengal basin faces arsenic toxicity.

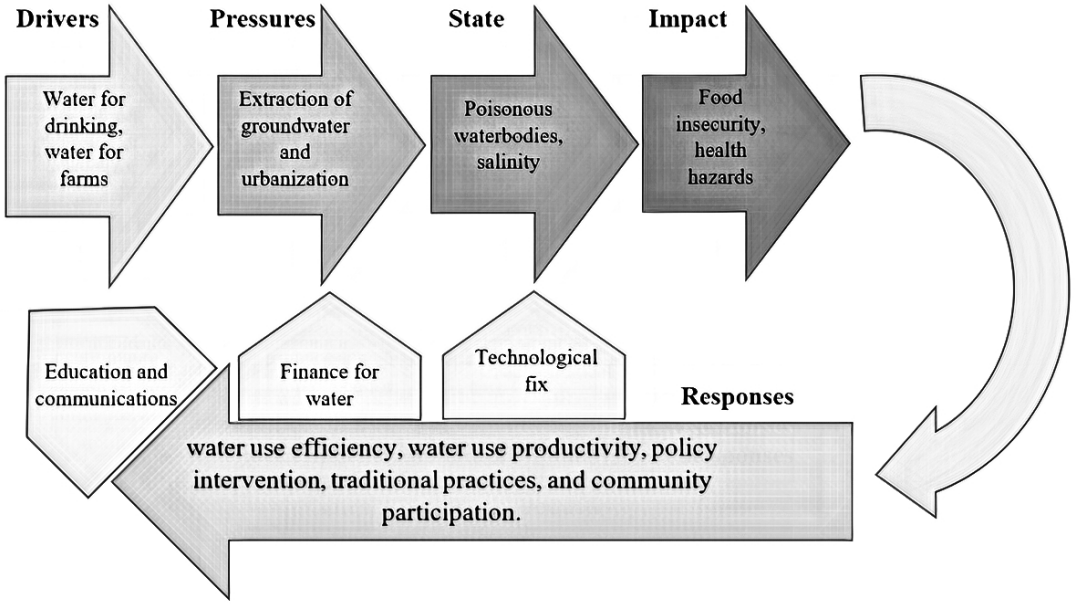

Figure: DPSIR framework, state of water in India

– theft, water loss (non-revenue water), and exploitation by private suppliers during transportation of water to communities in urban centres have increased water prices.

Solutions that can address irrigation will effectively solve 90 % of the problem. For rural India, provincial governments are already taking steps towards water use efficiency and water use productivity to minimize unsustainable cropping patterns. Furthermore, The Ministry of Jal Shakti (Water Power) began the dispatch of roughly $1.3 billion to support provincial-level governments under the National Rural Drinking Water Mission. Urban and peri-urban populations should learn how to calculate their water footprint and water accounting. These tools, if taught at academic institutions or pre-installed in cell-phones, could gradually impact behaviour. The Centre for Science and Environment is currently studying the potential of parks and open spaces (8000 hectares) in New Delhi as units of stormwater harvesting (Rohilla/Jainer 2020). The city's water supply has been affected many times by ammonia contamination in the Yamuna river (India 2021). Such measures could also benefit the provincial governments' water departments.

21 % of diseases in India are water-borne, 400,000 children die annually from diarrhoea (primarily due to contaminated water), and every year 200,000 people die directly (Hota 2020) as a result of a lack of access to clean water. The International Water Management Institute estimates that by 2050 water demand will increase by 32 % from 680 BCM in 2000, and industrial, domestic sectors will account for an additional 85 % of water demand (Amarasinghe et al. 2007). Measures for safe use, transportation, and reuse of water must be put into operation urgently. If not, the share of water-related diseases will increase substantially, costing around $600 million in the coming years.

Further to the problem of health hazards to human beings, the condition of water is also affected by climate change. India will observe an increase in climate refugees as seen in the Sundarbans (home to 85 % of India's mangrove forests), that are sinking into the land due to excessive extraction of groundwater. River dependent economic activities will suffer, and increased salinity will affect aqua biodiversity. The pressure on water supplies caused by unsustainable human activities has hit the environment and the Indian population is already suffering from the consequences. India is already experiencing effects such as reduced groundwater, food insecurity, soil erosion, economic exploitation, female students in villages dropping out of school to collect water, and a directly related increase in the suicide rate. This DPSIR model attempts to summarize the problem of water in India: Education and communication, green finance, and technology must address the growing water crisis in India. Policy tools and measures are an effective response to solve the water crisis. However, in India, such decisions are made by the provincial government. To this effect, water boards have the power to regulate groundwater extraction. The Constitution of India includes water on the State List versus the Union List.

Education and communications

Rural populations and farmers need to deploy solutions concerning water. The gross demand for water has to be reduced by farmers being taught of the ill effects of groundwater extraction, the benefits of low water-intensive crops, agronomic practices to improve crop productivity, and diversion from microloans resulting in suicide.

NGOs have been proven to have had a real impact. These include Paani (Water) Foundation's Water Cup (training in watershed management among thousands of villages to create entrepreneurial competition in water conservation), WaterAid India (work for drinking water security, rural sanitation), and Argyam's For Water initiative (collaborative thinking for water security), and many other initiatives that India has already set up.

Hiware Bazar, a small village in Maharashtra state in western India, tells a powerful story of community governance, transformed irrigation through water collection, rainwater harvesting, and watershed conservation. Furthermore, students at universities situated in peri-urban geographies have gained immense local know-how. Their knowledge could help initiate government efforts to solve local water challenges.

Alongside stories of water published by select media, the receding snowfall in the Himalayas is seldom if ever reported and its impact results in lower water levels in the Ganges and Indus river basins, a source of sustenance for 700 million people. The Third Pole contributes to this space. The India Water Portal is a helpful resource that includes local information on water. It aids research and informs the general population on the state of water in India. As media consumption grows and mobile penetration expands into rural India, it could also help address the water crisis.

Finance for water

By 2050, the demand for water in India will range from 900-1050 BCM, placing unbearable burdens on India. According to the Standard Chartered SDG Investment Map report (2020), the private sector could invest up to $19.2 billion in India towards SDG 6 by 2030. However, for non-bankable projects, private investments would need to gain public money. India Investment Grid e-platform has mapped investments amounting to $291 billion up to 2030 for the water and sanitation sector and $582 million up to 2025 for the food processing and agriculture sector and growing. As the agriculture sector has an embedded cost of water and agro-commodity consumption amounting to an estimated 620 million tonnes ($575 billion agri-food production value) by 2050 (Hamshere et al. 2014), (n.b. the above estimates are lower limits of projected values).

Blended finance is the outcome of public and private money working together. It may fulfil irrigation, water treatment plants, sewage collection, treatment and disposal, and solid waste management projects in India. Water.org in India has demonstrated active use of the same. The Ministry of Jal Shakti aims to provide a piped water supply (PWS) for clean drinking water to all rural households by 2024. According to the Centre for Policy Research, PWS covered only 18 % of rural households in 2019 (Irava et al. 2019) Critics argue that infrastructure projects (such as the interlinking of rivers) create carbon emissions. One goal of finance is to ease the ill effects of the pressures.

The future of finance for water is in the form of blended finance. No single stakeholder (private or public) has the muscle power or resources to solve water stress across India.

Technology intervention

In India, technology for water should enhance efficient irrigation management. The World Resources Institute's Aqueduct Water Risk Atlas has used data to deduce that India's water risk is at an 'extremely high' level. Software technology could include machines that execute data-driven precision farming, water optimization, cloud-based soil sensors, IoT sensors, smart meters and many other developments. Hardware technology could provide tools such as dikes for groundwater recharge, rainwater harvesting, air to drinking water units, drones for mapping farms, water recycling facilities, water-free urinals, and so on.

Technology will keep outperforming itself. The recent development of a futures market for water has not yet been discussed between decision-makers in India. If it could be viewed, for example, on a screen just how the groundwater beneath our feet is depleting, it might help sensitize us all. India will require a system-thinking approach dedicated to technology for water. However, climate change, zero rainfall (as seen in Chennai), or over-flooding may render some of these technologies obsolete.

Conclusion

A safe and sustainable future of water in India depends on the support of decision-makers. They must create high-quality services, provide a simple scope of pilot projects for future expansion, and include the community in the solution-building process (ADB 2020)[13] The decisions academia, civil society, farmers, financiers, government, media, NGO, think tanks, and rural-urban bodies make in the 2020s will relieve an average 40-something age Indian population in 2050 from being responsible for losing $1.5-2.5 trillion[1] (6 % of national GDP).

India must keep innovating for water in a collective spirit.

1 Gautam Adani debunks GDP rhetoric, says India will be 2nd largest economy by 2050. Retrieved from https://economictimes.indiatimes.com/news/economy/indicators/gautam-adani-debunks-gdp-rhetoric-says-india-will-be-2nd-largest-economy-by-2050/articleshow/78363145.cms (28. September 2020)

ABSTRACT:
DIE ZUKUNFT DES WASSERS IN INDIEN: PROJEKTIONEN 2050

Die Daten aus Indien zeigen, dass die Zukunft des Wassers düster ist – und sie werden bis 2050 höchst relevant bleiben. Dieser Artikel verwendet das DPSIR-Modell (Drivers-Pressures-State-Impact-Response), um aufzuzeigen, wie die Nachfrage nach Bewässerung und Urbanisierung den Wasserstress antreibt. Darüber hinaus untersucht der Autor die Rolle von inklusiver Kommunikation und Bildung, grüner Finanzierung und Technologie als Antworten zur Reduktion der Wasserknappheit. Glücklicherweise sind in Indien Formen der oben genannten Lösungen bereits in die kulturelle Praxis eingebettet. Indien muss die Lösungen auf intelligente, strategische Weise umsetzen, bevor die Wasserknappheit bis 2050 6 % des nationalen BIP ausspült.

Keywords: Wasser, Bewässerung, Indien, Zukunft, DPSIR-Modell

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PAINTING WITH LIVE COLOURS

Art has the potential to point to the future through experimenting and struggling with the contemporary by opposing it defiantly. While the art market has become internationally commercialised, artists regain their autonomy by breaking free of restricting formats—working on the human scale in reality—where their practice touches upon questions of ethics and aesthetics in different forms, society is driven forward and alternative infrastructures are frequently created. The Indian art scene is no exception, immersed as it is in a sub-continent with such a multitude of cultures, religions, languages, and phases of modernising converging. Moving into the 21st century, the question of how infrastructure is organised will become a defining factor of the future in India and artists may have a say in precisely that.

Keywords: Activism, Arte Útil, Alternative Infrastructure, Contemporary Art, Delhi

Raphael Perret

WALA

The Hindi word wala (m.), wali (f.) has no exact equivalent in English and bears several meanings. One of the most common is to designate an object or a person according to a specific property or feature. Hence an auto-rikshaw driver is an auto-wala and a tea vendor is a chai-wala, which can be translated as «the one with an auto» or «the one with chai». Playing with the versatility of the word as a designator for people who are known for their profession, the Delhi based artist group WALA[1] (Akansha Rastogi, Sujit Mallik and Paribartana Mohanty) leave the prefix open in order to open up a space for various contexts, formats, shapes, and associations from which they can let their practice develop. According to their website: «WALA sees itself as producer of situations, encounters, devices, formats that allow dialogues to occur with or without artists' presence.»

Performing in the Neighbourhood

When I met him for the first time in 2013, Sujit was living in a flat right across the border from North East Delhi in Ghaziabad, technically already in the state of Uttar Pradesh. He explained to me, that the house used to be surrounded by heaps of trash the neighbours used to throw from their balconies into the open space between buildings. Even though he tried to persuade them verbally to stop that habit, the waste kept piling up. Eventually, he decided to show how serious he was and made a performance by going out in the greatest midday heat during summer—a time when one tries to avoid stepping out of the shade—and dug up that mountain of trash with a shovel. According to him, it was this radical intervention, involving his bodily fight against the merciless heat of the sun, that won his neighbours over, made them change their minds and ultimately allowed the space to be cleared.

1 https://walacollective.wordpress.com/

Escaping Art

At the same time, he mentioned his dissatisfaction as a painter, that usually one person ended up owning his work and the more attention he received, the more people started to try and influence him and his work. Even though he had an individual art practice, the work became an eclectic work of a collective, in which he was not able to recognise himself. His way out of these pitfalls was to start growing plants on the roof top, which had been an empty concrete surface up to this point, and slowly but surely start a lush garden that would attract insects and birds and create a friendlier microclimate. His work could not be owned in a strict sense and it was his intention to give it, in the shape of saplings and plants, away to his neighbours, for them to grow more plants and green their roof. When he had to move out of the flat, he was asked to remove his ‹forest›, which was dissolved—though some plants had grown too large and could not be removed any longer so had to remain there—and distributed among the people living around him, turning more roof tops into beautiful gardens. The occupation with gardening led him to think and work deeper on the topics of land and soil, their significance and conservation. Out of that process came the urge to deal with the reality beyond his enclosed garden-space on farmland, by becoming saag-wala (saag = greens, spinach, and other leafy vegetables) or «the one with greens».

Saag-Wala

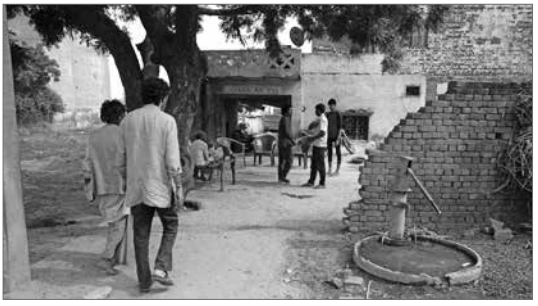
He started to cultivate 1 acre of land together with a friend and moved later to a bigger 2-hectare patch in Loni with 2 hectares. By the time of my visit Saag-Wala in 2018, it had grown into a multidisciplinary collective that had a multitude of ideas, experiments, and operations concerned with organic crops, food safety and the relationship between farmers and consumers, and now understood itself as a body of

solution-finders rather than growers. A vegetable store was set up, in which fresh produce was packaged and delivered to subscribers, community meetings were held, and ideas discussed for educating workers, farmers, and consumers. Financing models were tried out, in which supporters could invest in land and get their interest back in produce. The price per kilogram for all crops was uniformly fixed at 62.52 rupees throughout the entire year. This was about a fifth of the price of other organic sellers, putting it within reach of middle- and lower-income families, who could budget for it throughout the entire year as the cost was only 2.52 rupees higher than inorganically grown vegetables. Though this service would only be granted to subscribers, who would regularly visit the farm—not to work—but to interact with the farmers. This helped in dealing with complaints and preventing subscription cuts. The idea being: when a farmer takes care of a family, the family must take care of the farmer, in order for she*he not to feel alone.

Live Colours

As a saag-wala, again nobody was able to privately own his practice. His work dissolved into the effort of a publicly communicated collective, the odd twist here being that it became fully his own. Sujit recalled the difficulties of his former art practice. The worst part for him was the search for an accurate design to communicate his idea in a medium like painting, sculpture, or performance. To come up with a narrative that fit into the frame. Furthermore, after finishing a painting, the question of «what comes next?» arose immediately. As a consequence, he started to experiment with what he called live colours rather than the dead colours of his former practice. The colours left the restricting boundaries of the frame and the first step into this direction took place during a residence, in which he had a live chicken in a gallery space as a work with live colours. Now the greens in the fields were the live colours he was working with. A plant in his story became a plant in real life. In his own words, the question of art depends on the idea of the work and the space in which it is taking place. His narrative and reality were now overlapping and the colours themselves had their own life, they were growing, changing, dying and at the same time nourishing, connecting and transforming people. How he designed the community and the structure to maintain the

The cleaned space



Sujit, Baba-ji and Pawan Kumar Dubey visiting farmers in Loni

A crop sample

Gardening on the roof top. Paribartana Mohanty and Sujit Mallik

Sujit at his farm in Loni

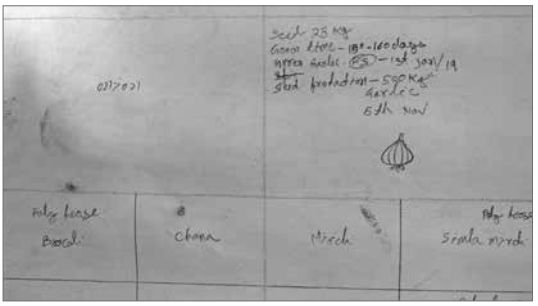
Cooking performance with organic vegetables from saag-wala

Checking seeds

Visiting the fields

Pumkins in the field

Sujit, Baba-ji, Pawan Kumar Dubey



Field plan on canvas

Cauliflower

system and the quality became the art. Not only was he living a story in his realm of reality, the domain of his story expanded as people started to talk about his endeavour and became involved in it. This resonates greatly with Nicolas Bourriaud's idea of Relational Aesthetics: «… the role of artworks is no longer to form imaginary and utopian realities, but to actually be ways of living and models of action within the existing real, whatever the scale chosen by the artist.» (Bourriaud 2002: 13)

The Distance between Art and Reality

Sujit's journey, his dissatisfactions, obstructions, and responses and with all that the development of his art practice, moves progressively along the lines Cuban artist Tania Bruguera described in her presentation[2] on the occasion of the Verbier Art Summit 2019,[3] as the distance between art and reality. A distance that opens up a space for different strategies, forms and functions of art while putting the artist as well as the audience in different positions and relations to each other. That distance stretches from a complete separation between the poles of art and reality to a congruent match of both. In it, the function of art reaches from representation to presentation and implementation of an idea. In all stages of this spectrum, different forms and functions of art practices create a different intertwining between aesthetics and ethics.

Arte Útil

It is notably Bruguera's interest to work at the end of the scale, in which the artist is an initiator, the artwork becomes a case study, results are implemented, and the former spectator turns into a user. A practice she calls Arte Útil[4], which can be summed up in her demand: «I don't want an art that points at a thing, I want an art that is the thing» (Thompson 2012: 21). In this overlapping between art and the thing, I see a match with Sujit's desire to paint with live colours. The parallels become even more stark in her explanation of Arte Útil. «Arte Útil is not art for institutions, but art for the people: it is art that enters people's houses, people's lives. We work on the human scale … we have to stop asking ourselves in what medium and with which materials I would do my art, where I will do it, how I would package, circulate, or sell it, and, every time we begin a new artwork, start asking ourselves the question ‹what am I doing this art for?›» (Malzacher 2014: 299–300)

The Future-Wali*a

In Bruguera's terms, art is action and hence to be understood as a verb. And where there is action, there is activism close by. A field in which the curator and theorist Nato Thompson has observed a shift from the tactical to the strategic (Thompson 2014: 152) in the last two decades. The tactical being best represented by a trespasser, who is dancing on the ground owned by others, creating meaning in relation to the power structure in place for the sake of a gesture. And the strategic coming into play when one controls the use of a space over a long period of time and is able to create enduring structures and infrastructures. Exactly the field, to which Sujit explained his art has shifted. Considering that art has the potential to freely experiment and point toward a possible future by «… cracking open the ailments of the contemporary by cracking open the limits of art» (Olma 2018: 94), I would not be surprised to see more alternative infrastructures to be implemented by artists. Hence, will the art-wali*a be the future-wali*a by becoming the infrastructure-wali*a?

2 https://www.youtube.com/watch?v=viRq8GmOMYM
3 https://www.verbierartsummit.org/2019
4 https://museumarteutil.net/

ABSTRACT:
MALEN MIT LEBENDIGEN FARBEN

Kunst hat das Potenzial, durch Experimentieren und Auseinandersetzung in die Zukunft zu verweisen, indem sie sich ihr trotzig entgegenstellt. Während der Kunstmarkt international kommerzialisiert ist, gewinnen Künstler/innen ihre Autonomie zurück, indem sie aus einschränkenden Formaten ausbrechen. Sie arbeiten in sozialer und humaner Realität, wo ihre Praxis Fragen der Ethik und Ästhetik in verschiedenen Formen tangiert, die Gesellschaft vorantreibt und häufig alternative Infrastrukturen schafft. Die indische Kunstszene ist in dieser Hinsicht keine Ausnahme. Sie ist eingebettet in einen Subkontinent, auf dem eine Vielzahl von Kulturen, Religionen, Sprachen und Phasen der Modernisierung aufeinandertreffen. Auf dem Weg ins 21. Jahrhundert wird die Frage, wie die Infrastruktur organisiert wird, zu einem bestimmenden Faktor der Zukunft in Indien werden, und Künstler/innen können dies mitbestimmen.
Keywords: Aktivismus, Arte Útil, Alternative Infrastruktur, Delhi, Zeitgenössische Kunst

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A PUBLIC DIGITAL INFRASTRUCTURE FOR INDIA'S FUTURE

For over a decade, India has been at the forefront of building public digital infrastructures, collectively known as the India Stack. This started with solving India's «identity crisis» by attributing a digital identity to over 1.2 billion Indian residents through Aadhaar. This has not only redefined the relationship between the state and its citizens but through the interoperable, modular design of the technology platforms of the India Stack has also unleashed India's entrepreneurial energy, leading to a fintech revolution and is on the cusp of transforming the healthcare system. However, the governance and accountability frameworks currently in place leave the door open for potential misuse of these technologies, fostering public mistrust in those evolving technology-based policy tools.

Keywords: digital infrastructure, India Stack, Aadhaar, fintech, healthcare

Sebastien Hug, Aparna Kumaraswamy, Archit Kansal

Redefining public infrastructures in the digital age

The development of the modern nation state was closely linked with the fundamental changes in the society and economy brought about by the Industrial Revolution. The shift from a largely rural, agriculture-based society to an urban, mass-manufacturing industrial one required the emerging modern states to build solid infrastructures, such as roads, railway systems, and airports as well as schools, hospitals, and public libraries. After the World War Two, the economic boom enabled by electronic automation and information and communication technologies (ICT) powered the expansion of the modern welfare state in Europe, establishing social security networks and public health systems. In this context, public infrastructures were largely understood as investments in physical common goods, primarily provided by the state for shared use by the public. In the recent advent of the Digital Revolution, this notion of public infrastructures is being revisited. Developing and emerging economies, in particular, have recognized the potential of digital solutions to leapfrog and to address socio-economic challenges in a novel way.

Building its version of public digital infrastructures, collectively known as the India Stack, India has been a front runner now for over a decade. The India Stack[1] is a so-called Open Digital Ecosystem (ODE), which can be defined as «open and secure digital platforms that enable a community of actors to unlock transformative solutions for society, based on a robust governance framework» (Omidyar & BCG 2020: 17). Accordingly, ODEs can be looked at from three distinct angles: (1) the technology platform itself, (2) the community building products based on this digital platform, and (3) the governance framework to safeguard users rights and define the rules of the game.

Creating the foundational technology: Aadhaar et al.

In several Indian languages, *Aadhaar* means «base» or «foundation». Today, Aadhaar also stands for the world's largest biometric ID system, which attributes a 12-digit unique identity number to Indian nationals and residents and is the centre piece of the India Stack. The initial mission of Aadhaar was to solve India's «identity crisis» (Ramnath & Assisi 2018: 2). In 2009, approximately 400 million residents of India were unable to prove their civic identity as they remained completely undocumented. As a result, millions of Indians from the lowest socio-economic bracket had been unable to claim government subsidies as the public authorities were unable to authenticate their identity. Nandan Nilekani, the co-founder of India's largest IT company, Infosys, who joined the federal government to lead and build the Aadhaar initiative, put it as follows: «Unique identification of each citizen also ensures a basic right – the right to an acknowledged existence in the country, without which much of the nation's poor can be nameless and ignored, and governments can draw a veil over large scale poverty and destitution» (Nilekani 2008: 368). By developing one IT-platform which makes the identity of Indian citizens more easily verifiable across the multiplicity of siloed government departments and schemes, «would make the relationship between the state and the citizen infinitely less traumatizing in both time and energy wasted», argued Nilekani. Today,

1 Technically speaking, the India Stack is a set of Application Programming Interfaces (APIs), which create a transmission bridge between two software applications. An OpenAPI, such as the India Stack, are APIs that are made publicly available to software developers, allowing them to build services which give consumers secure access to the data base. India Stack is the largest API in the world.

1.25 billion (out of 1.34 billion) Indians possess an Aadhaar digital identity.

The design principles of Aadhaar's technology platform – and by extension, the India Stack, – are as simple, as they are revolutionary. Aadhaar's chief architect, Pramod Varma, explained its approach as follows: «The way to solve India's hard problem, wicked problem, was not by building solutions, but by building Lego blocks that could be used by people on the ground, closer to the problem, to assemble, build solutions» (Ramnath & Assisi 2018: 88). Following this Lego-Design-principle, the India Stack's success is due to its interoperable modular design, whereby each platform performs only basic functions independently, but can be linked to other platforms and exchange information in a secure way. For instance, Aadhaar's mission was not to establish citizenship, or to ensure subsidy delivery, but simply to establish and document a unique identifier for all (eligible) residents of India. Over time, other modules of the India Stack were built on top of Aadhaar, creating four distinct technology layers[2]:

- *Presence-less layer:* On the basis one's identity being established via Aadhaar, its participants can now access various schemes digitally from anywhere in the country.
- *Paperless layer:* With the eKYC (Know-Your-Customer) platform, a bank account can be opened without having to provide paper-based documents; eSign provides for an officially recognized digital signature; and the Digilocker offers a repository for important documents (i.e., driving license, academic diplomas, etc.) which can be accessed by third parties upon the account holder' consent.
- *Cashless layer:* The UPI (Unified Payments Interface) enables payment apps to offer digital payments services, including peer-to-peer transactions between two bank accounts.
- *Consent layer:* The NBFC-AA[3] allows users to digitally share financial data with service providers, i.e., to apply for credit lines or other financial products.

On the basis of these modular technology platforms, it was then up to India's tech community to build customer-centric applications. Fintech entrepreneurs were the first to fully seize the opportunities of the India Stack and unleash the beginning of a digital payment revolution.

India's Fintech Revolution

With Aadhaar, eKYC and in particular UPI which was launched in 2016, the foundation was laid for the entrepreneurial community to build innovative financial products. Hence, from 2015 to 2016 more Fintech start-ups were founded in India than anywhere else in the world, except China (Medici 2019: 06). In 2019, the ecosystem had over 2000 Fintech start-ups, almost 50 % based in Mumbai, the financial hub, and Bangalore the Tech capital. The most prominent segment is the digital payment services providers; India's Unicorn Paytm tops the ranking with approx. 140 million active users a month. America's Big Tech is also looking for a slice of the expanding pie. In late 2020, WhatsApp gained permission to roll-out its Peer-to-Peer payment services to its 400 million user-base. GooglePay has been such a huge success in India that Google recommended the US Federal Reserve be inspired by India's UPI model. Aside from the payment segment, lending services have also experienced a huge uptick.

The biggest hope is that this entrepreneurial flurry will not only benefit urban India, but above all hopes it will increase financial inclusion of the rural and poorer populations. However, while most Indians now have a bank account, many accounts remain dormant due to financial illiteracy, inappropriate financial products for the poor, preferences for cash payment, and jewellery and animals persist as financial saving vehicles (USAID 2019: 36). Nonetheless, UPI-based transactions continue to grow rapidly. Currently, over 2 billion transactions are made based on UPI per month, and it is expected in two to three years daily transactions will grow to1 billion. In the light of this success story, India's policymakers and IT entrepreneurs now attempt to surmount the next big challenge: the healthcare sector.

The next frontier: The National Health Stack

In 2018, the Government of India launched its Universal Healthcare Coverage program, Ayushman Bharat, to increase access to affordable health services. Digital technologies are expected to play a central role. The COVID-19 pandemic has further exacerbated – worldwide – the necessity of data-driven healthcare systems to enable time-sensitive, evidence-based decision-making. The National Health Stack (NHS) is India's method for developing and bringing its health system well and truly into the 21st century. The National Digital Health Mission (NDHM) was launched, in August 2020, in the midst of the pandemic: «to create a national digital health ecosystem that supports universal health coverage in an efficient, accessible, inclusive, affordable, timely and safe manner, through provision of a wide range of data, information, and infrastructure services, duly leveraging open, interoperable, standards-based digital systems, and ensuring the security, confidentiality and privacy of health-related personal information»[4].

2 https://www.indiastack.org/about/ (5 February 2021).
3 Non-Banking Financial Companies – Account Aggregator

4 Government of India, National Health Authority (2020). Press Release of 15 August 2020. https://ndhm.gov.in/media/pressReleasePdf (6 February 2021).

The NDHM was not compelled to start from scratch to start from scratch. Over the last few years, the non-profit, technology think tank from Bangalore, iSpirit, had already been developing the core components of the Health Stack. The NHS is composed of basically two layers of cloud-based services: Firstly, the National Health Registries layer is a single, centralized repository of all the health facilities in the country (hospitals, labs, beneficiaries, insurers, pharmacies etc.). Building on these registries, the second layer offers: (1) a Coverage and Claims Platform for large-scale insurance programmes and government schemes; (2) a common Personal Health Record Framework to archive in one place all medical records of a person; and (3) a National Health Analytics Framework, which will draw on these aggregated and anonymized datasets to support health policy-making and interventions with specific data analytics. Similar to how the UPI drove innovation in the finance sector, the NHS's data goldmine and ODE approach is set to boost healthcare innovation in India. Efforts to find immediate solutions that can be integrated into the platform have been initiated by the Government, itself, with, for instance, specific start-up competitions. The National Health Authority of India has also begun to mentor start-ups in partnership with the ACCESS Health Digital's Social Entrepreneurship Accelerator (SEA) program.

Catching-up: Governance of the digital

While institutions such as the World Bank point to India's technology-based strategy to increase social inclusion as a blueprint for other developing countries, and the country's start-up community thrives due to the Open Digital Ecosystems approach, the India Stack and its various components have faced a great deal of criticism from civil society groups and privacy advocates. The various controversies have pinpointed India Stack's Achilles' heels: (1) the lack of – or the slow process in establishing sufficient governance structures to regulate those rapidly developing digital commons; and, (2) the tension between the need for public accountability and due process on the one hand, and the lean start-up culture – «move fast, break things and then maybe patch them later, launch and iterate» (Ethiraj 2020) – of India's entrepreneurial community, on the other. A case in point is Aadhaar which, despite its far-reaching consequences, was launched without a sufficient legal basis. Only years later, lawmakers followed suite. The lack of clear governance frameworks and the temptation to use digital tools to influence, govern or control the masses also leads to confusion over the voluntary or mandatory nature of those digital platforms. Aadhaar was initially meant to be voluntary, but the push of government and private players to make the Aadhaar ID a pre-requisite to access many services made it *de facto* mandatory. Very similar concerns have been raised about the National Health Stack (Singh & Porecha 2020). Hence, critics argue that this ambiguous approach leads to a renewed exclusion of the poorest as they are unlikely to possess the required infrastructure or the digital literacy skills to opt-in. Moreover, the long-awaited Personal Data Protection Bill appears to have stalled in parliament and competing legislative projects on regulating digital data are emerging from Delhi's bureaucracy, which contributes further to the confusion and uncertainty (Salman 2021).

India is – without doubt – among the leading countries in redefining and developing a public digital infrastructure. The speed and scale at which those digital commons are being deployed is impressive by any standards and speaks to the entrepreneurial energy of this country. Though the complexities of social challenges might not all be solved by a binary code, the India Stack presents a big opportunity to make the society more inclusive, whether in finance, health, or other sectors. The challenge for regulators is to keep up with the rapid pace of disruptive technologies and innovative business models, not least to ensure that the risks associated with those digital platforms are mitigated as much as possible and the public is able to maintain trust in these new infrastructures.

ABSTRACT:
EINE ÖFFENTLICHE DIGITALE INFRASTRUKTUR FÜR DIE ZUKUNFT INDIENS

Seit über einem Jahrzehnt steht Indien an der Spitze des Aufbaus öffentlicher digitaler Infrastrukturen, die unter dem Namen «India Stack» bekannt sind. Über 1,2 Milliarden indischen Einwohnern wurde durch das System «Aadhaar» eine digitale Identität zugewiesen, was nicht nur die Beziehung zwischen dem Staat und seinen Bürgern neu definiert, sondern durch das modulare Design der Technologieplattformen des India Stack auch Indiens unternehmerische Energie freigesetzt hat. Dies hat zu einer Fintech-Revolution geführt und das Land an die Schwelle zur Transformation des Gesundheitssystems gebracht. Die derzeitigen Rahmenbedingungen für Governance bergen jedoch auch einen potenziellen Missbrauch dieser Technologien und fördern deshalb das Misstrauen der Öffentlichkeit gegenüber diesen sich entwickelnden technologiebasierten Politikinstrumenten.

Stichworte: Aadhaar, digitale Infrastruktur, Fintech, Gesundheitswesen, India Stack

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VERANSTALTUNGEN

Moventia
«Innovation through Internationalisation»
22. April 2021
Kosmos, Zürich
https://www.movetia.ch/news-events

The Future Laboratory
«Retail Futures»
29. April 2021
Online-Veranstaltung
https://www.thefuturelaboratory.com/events

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«Mitgliederversammlung 2021»
16. Juni 2021
16–19 Uhr
Nationalbibliothek Bern

71. Internationale Handelstagung
«Die neue Nähe: Handel in fragilen Zeiten»
9. und 10. September 2021
Gottlieb Duttweiler Institut
https://www.gdi.ch/de/veranstaltungen/71-internationale-handelstagung

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«50 Jahre swiss**future»**
Cabaret Voltaire, Zürich
21. Oktober 2021
www.swissfuture.ch

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«Netzwerk Zukunft Schweiz»
23. November 2021
17–20 Uhr
Raiffeisenforum, Bern
https://www.netzwerk-zukunft.ch/veranstaltungen/

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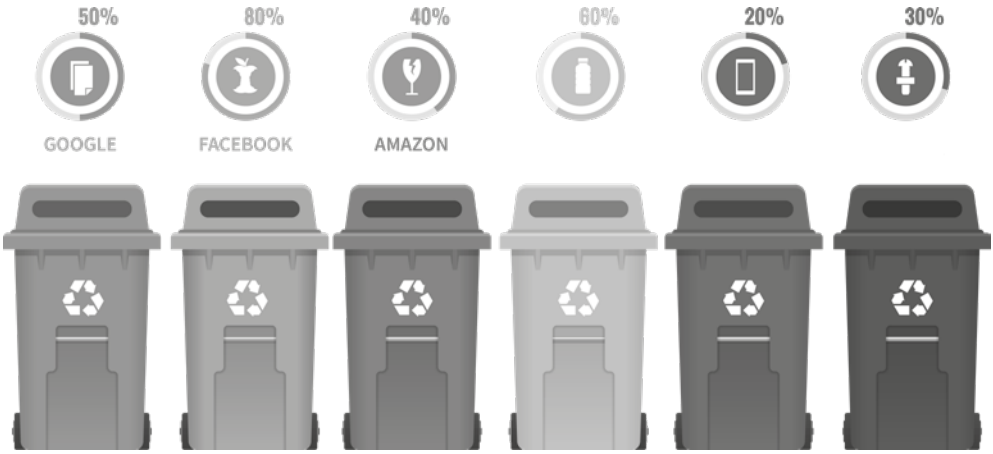

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