Narendar Pani
Tarun Menon
Nithin Nagaraj
Tejal Kanitkar
Srikumar Menon

Towards an Institutional Strategy for the Study of Sustainability
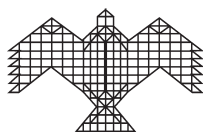
National Institute of Advanced Studies
Bengaluru, India

TOWARDS AN INSTITUTIONAL STRATEGY FOR THE STUDY OF SUSTAINABILITY

NATIONAL INSTITUTE OF ADVANCED STUDIES

Bengaluru, India

2020

Towards an Institutional Strategy for the Study of Sustainability

Over the last three decades, National Institute of Advanced Studies, Bengaluru, has evolved as one of India's leading multidisciplinary research and training institutions. It has, during this period, built on its mandate to carry out multidisciplinary research and to use the results of that research to help build a new leadership in India. A major step in this direction was taken by focusing on specific initiatives, drawing on inputs from multiple disciplines. The research on river conflicts, for instance, drew on elements of geography, hydrology, economics, and politics. The practice of multidisciplinary research has, over time, thrown up not just answers to questions that have been asked about diverse aspects of the country, but also raised new questions. Some of these questions have been recurring, arising again and again in the course of multidisciplinary research in very different directions. Among the more frequent of these recurring questions are those that relate, directly or indirectly, to issues of sustainability. A strategy for national security would self-destruct if it used resources in a manner that was not sustainable; the protection of our heritage can be seen as a response to the need to sustain memories of our past; the need to study inequality comes from an understanding that grossly unequal societies are not sustainable; the initiatives on inclusive education recognise structured processes of learning as an essential requirement for a sustainable society; and so on. As individual programmes have responded to these challenges, an institute-wide approach to sustainability has evolved from below. This note seeks to make this approach explicit by placing it in the context of the larger debate on sustainability. It then goes on to develop this approach into a strategy to enhance the contribution of NIAS to the larger cause of sustainability, in the realms of theory, empirical evaluation, and policy.

The Concept of 'Sustainability'

Despite its increasing prevalence in policy, activism and academia, the concept of "sustainability" (and, relatedly, "sustainable development") remains ambiguous. The ambiguity is partially attributable to the sheer breadth of

the concept, which has resulted in its adoption and analysis by a wide range of disciplines – economics, ecology, environmental science, engineering, political science, biology, and many others. This diversity of methodological perspectives has led to a variety of distinct, sometimes contradictory, conceptions of sustainability, each moored in the theoretical presuppositions and practical concerns of its home discipline (Brown et al, 1987 and Kidd, 1992).

But it is not just the diversity of descriptive approaches that accounts for the ambiguity associated with the concept, because "sustainability" is not merely a descriptive term. It is normatively loaded – committing to a particular conception of sustainability almost inexorably commits one to a particular set of ethical and political priorities (and the associated implications for social and policy action). This unavoidable normative dimension adds a further layer of contestation to the concept. Resolving this contestation conclusively may be a pipedream, since there are potentially irreconcilable value frameworks involved, but progress can still be made in clearly mapping the landscape, making explicit the often hidden philosophical commitments – both descriptive and normative – that one takes on when one works with particular notions of sustainability. Rigorous academic work on sustainability must involve some such

conceptual ground-clearing, rather than simply an unreflective adoption of some ready-to-hand definition of the concept.

Perhaps the most well-known ready-to-hand definition comes from the Brundtland report. The report, prepared by the World Commission on Environment and Development in 1987, was self-confessedly an attempt to create a broad "consensus on the basic concept of sustainable development and on a broad strategic framework for achieving it", while remaining vague enough to allow some scope for varying interpretations. And indeed, the framework articulated in the report has formed the basis for the international sustainability agenda, although it has also been subject to significant criticism. Since a universally accepted definition does not exist it is useful to begin with a widely accepted definition and modify it to address the specific challenges that definition may face. Sustainable development, according to the report, "is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

The report's emphasis on a needs-based perspective on the ethical dimension of sustainability is an area demanding further investigation. What does it mean to understand equity in terms of "meeting needs"? Can the notion of

"essential needs" be precisely articulated and operationalized? Does this ethical perspective preclude other potentially compelling approaches to equity? Adequate answers to questions like these should precede any commitment to a needs-based approach to sustainability.

Needs are, presumably, different from desires or preferences. Not everything one wants is something one needs. On one natural construal, needs are more objective and universal than desires. There may be near endless variety in peoples' desires, but their needs – at least, their *essential* needs – are more uniform, keyed to something shared rather than the vagaries of psychological idiosyncrasy. The apparent objectivity of needs may also help ground their normative salience – the notion of a "need" seems to command moral attention in a manner that a mere "want" does not. Many would argue that a person simply desiring something is not sufficient to obligate others to provide what is lacking, but if there is an unmet need (especially an essential need) that the person cannot meet without assistance, then certain other parties – perhaps the state, perhaps other members of the relevant community – do incur an obligation to provide that assistance.

If we dissociate needs from preferences, however, the question remains: What is the basis for determining the "essential needs" of an individual or group? The answer to this question will hinge, at least partially, on how one construes the term "essential". If the needs we must consider are essential, then they must be essential *for* some end, essential *to* achieving some goal, and we must identify the ends in order to characterize the needs. One conception of "essential need", for instance, may simply be the basic biological requirements for human survival. However, this threshold seems far too minimal to support any substantive conception of equity. One must, then, go beyond mere biological constraints and conceive of essential needs in some richer sense, aiming at a notion of human well-being that goes beyond mere survival. There are a number of proposals for how one might develop a more robust and ethically plausible theoretical conception of needs. Needs may be understood as requirements for avoiding certain forms of harm (Miller 1999), or as the conditions necessary to attain some threshold of human flourishing (Reader 2007), or as preconditions for non-impaired participation in social life (Doyal and Gough 1991), or as requirements necessary for capabilities to attain certain valued social functionings (Sen 1999).

A further issue is the extent to which essential needs are shared throughout a given community or population. Do all individuals have roughly the same essential needs, or do their needs differ depending

upon various contextual factors? Any need-based notion of sustainability will have to navigate between the Scylla of excessive heterogeneity, which might make it difficult to make any politically useful generalizations about sustainable development, and the Charybdis of an artificial homogeneity, which, in defining needs as broadly shared, may end up ignoring the specific needs of those who are marginalized from the dominant discourse due to their social, economic, or (in the case of the international sustainability regime) national location.

NIAS has an advantage in such conceptual ground-clearing as it has always been deeply conscious of the philosophical traditions underlying the practices of both natural and social sciences. The institute has a history of work on the philosophy of science, beginning with established scientists extending their work into philosophy. A unique feature of the Institute has been its ability to maintain a continuing discussion on the complex relationship between science and society. This discussion ranges from abstract philosophy to the realm of practice. For example, the Consciousness Studies Programme has seen indigenous medicine as not just a particular medicinal practice or a codified system of healing but as something that involves the life and living of the indigenous people, their ecologies, oral histories, as well as

their relationships with cosmic forces, neighbouring communities, plants, trees and life in general. With an intricate and complexly networked philosophy being the basis of indigenous medicine, understanding how the healer impacts a mind, or how the healed mind is impacted upon, necessitates an intensely engaged ethnographic methodology which builds transdisciplinary phenomenology into its methods of search and understanding. There is also a need to develop methods to unravel the causal relationships between the pillars of sustainable development. To this end the programme has developed a robust framework for performing causality testing for complex multi-variate systems - particularly stochastic, chaotic and hybrid systems.

Other programmes at NIAS have also contributed to this conceptual ground-breaking, particularly in terms of the methods they have adopted. There are programmes that have worked on developing specific models, even as others have focused on the insights of ethnography, and yet others have done both. This ability to deal with diverse methods has provided NIAS a strong platform to address issues of sustainability. It can use and develop ecosystem models just as it is capable of utilizing other methods to understand ecological and anthropological phenomena.

Understanding the Practice of Sustainability

As we move from the broader considerations of the philosophical domain to the more repetitive methods of the practice of science there is a need to move from the broad definition of the Brundtland report, based on concepts of needs, to elements that are easier to monitor. The report goes on to identify sustainable development as the intersection of three goals – protecting the environment, preserving economic growth, and promoting equity. The environmental and economic goals are linked through an understanding of our ecosystems as stocks of capital that can be utilized to produce goods and services. Sustainable development, according to the report, means that the yield we extract from this natural capital must not threaten the ecosystem's ability to maintain the same or increasing levels of yield over time.

NIAS has contributed to the evolving challenges in India of protecting the environment, preserving economic growth, and promoting equity. Its concerns about the environment have been pursued by the School of Natural Sciences and Engineering. In this school, the Complex Systems Programme uses nonlinear dynamics to predict interactions among natural systems. Current projects are in line with several aspects of sustainability. These include studies on the impact of human intervention and changes in land use on insect outbreak cycles, on prevention and reduction of the impact of invasive alien species and on sustainable patterns of chemical use that are environmentally sound, amongst others. Some key predictive models developed by the Programme span other aspects of sustainability, such as early warning of climate change through prediction of climate tipping points, quantification of species-specific characteristics of animal-movement models useful in conservation efforts of threatened species, and predicting climate-change impact on marine ecosystems and biodiversity. In the same school, the Energy and Environment Research Programme attempts to balance increasing economic growth and access to energy with environmental sustainability. The projects under this programme have a prominent place for ensuring sustainable energy production, including greater adoption of clean and environmentally sound technologies and industrial processes, and greater resource efficiency. The programme also foregrounds the need to understand the interactions between energy systems, the environment, and economic and social systems, in order to achieve not only a more comprehensive, but also a more inclusive understanding

of sustainability. The Animal Behaviour and Cognition Programme in the school focuses on conservation of wildlife, human-wildlife conflict, social cognition and decision-making interactions. The programme has studied land use change as a driver of human-primate conflict in northern India, mitigation strategies adopted in Karnataka and Tamil Nadu recommended through research findings on human-elephant conflict, and human-street dog cohabitation and rabies prevention in Chennai -- all projects that ensure the provision of relevant information and awareness of lifestyles that are in harmony with nature. Further, there have been projects on conserving the diversity of indigenous fish species, aimed at enhancing marine biodiversity as well as halting its loss.

NIAS has also carried out research on several aspects of preserving economic growth. It has examined the specific role of the dispersion of industries in economic growth. It has laid particular emphasis on inclusive growth, looking at the working of formal and informal financial mechanisms. It has explored the nature of the coexistence of both the formal and informal mechanisms in the rural credit market. It has also recognised the security environment needed to preserve economic growth. The Conflict Resolution and Peace Programme at NIAS has tried to reduce the knowledge deficits

about conflicts in India through original research, backgrounders on individual conflicts, and courses. It has generated both quantitative and qualitative insights into a range of conflict related issues, from reservations to Maoism. The International Strategic and Security Studies Programme focuses on ensuring and building national security through research on indigenous aircraft development, on assessing the space and nuclear capabilities of countries, on weapons systems, and on the socio-cultural, religious and economic profiling of certain communities.

NIAS has also been sensitive to the fact that the idea of preserving resources for the future cannot be confined to material resources. A broader view of needs would go beyond the material to include the non-material; it would include both the tangible and the intangible. One of the important and often underestimated needs that has to be protected and passed on from generation to generation is that of heritage. UNESCO defines heritage as "our legacy from the past, what we live with today and we pass on to future generations" (UNESCO, 2008, p. 5). This legacy we have inherited is generally classified into natural, built, and living heritage. The conservation of built heritage has conventionally been conceived as centred on material culture – exemplified by monuments and collections in museums etc. However, of late, these

material remains have come to be regarded as merely the physical manifestations of cultural processes which led to their production. Hence the objective of preservation of built heritage is now seen through the prism of inheritance of memory, which needs to be passed on to coming generations (Nocca 2017). In NIAS the Heritage, Science and Society Programme seeks to document and preserve heritage and material culture in the course of exploring the links between science, technology, culture, society and civilisation through projects like "Digital Hampi" and "Archeometallurgical Mapping of Shifting Iconographies". It also studies living heritage whether it is in the form of living crafts or in the realm of performance.

The goal of equity, in the Brundtland definition, is understood in terms of the concept of needs. In particular, the Brundtland report argues that the "essential needs of the world's poor" should be given "overriding priority". While the notion of sustainable yield constrains how much of the natural capital stock can be extracted, the conception of equity constrains how the goods and services yielded should be distributed: in a manner that prioritises meeting the essential needs of the poor. The assumption underlying the Brundtland framework of sustainable development is that these two constraints are compatible, that what one extracts at a particular time is sufficient to meet essential needs without depleting natural capital. Furthermore, the compatibility of these constraints must persist across generations, which implies that trends in demography, resource usage and socio-economic institutions can be structured to allow each generation to meet its needs over a reasonably long (perhaps effectively indefinite) term.

Implicit in this approach is a conception of essential human needs as dynamic, changing in response to changes in the material or ideological conditions, although it is possible that these changing needs could be particular social manifestations of something deeper and more constant in human nature that persists across socio-economic transformation. If needs are regarded as being dynamic, this seems to threaten their supposed objectivity, which was meant to be an advantage of the needs-based approach over a preference-based approach. However, relativity to social context is not enough to completely rule out objectivity – one might, for instance, plausibly maintain that essential needs (unlike desires) are shared and objectively given *within* a particular social context. While many of the essential needs of a twenty-first century Indian person would very probably differ from those of, say, a fifteenth-century Aztec person,

they may not differ much (or maybe at all) from those of another twenty-first century Indian.

If essential needs are relative to social context but shared by everyone within a given context, the question arises of how finely one must carve out the relevant social categories to distinguish groups of people with different essential needs. A variety of variables might be relevant to determining a person's essential needs: their occupation, their gender, their physical environment, their age, their state of health, their social relationships, etc. The more distinctions we regard as relevant to a determination of needs, the less universal those needs become. So conceptual decisions we make about how to define "essential needs" will also tell us how diverse these needs can be, and the aspects of society to which one must pay attention when empirically determining needs.

The Inequality and Human Development Programme at NIAS enters this debate by emphasising the distinction between difference and inequality, where the latter refers to that subset of all differences that are ethically unacceptable. It goes on to note that what is ethically acceptable can be arrived at through rationality dominated means, that is normative inequality – or through deeply held beliefs that are not always rationally defended, that is

descriptive inequality. The programme has explored the interaction between normative and descriptive inequalities. This empirical and conceptual exploration has helped identify some of the causes of inequality, such as particular forms of agrarian transformation, as well as some of its consequences, particularly farmers' suicides.

The challenges of equity are also reflected in the work of the Urban and Mobility Studies Programme which explores diverse social transformations in post-liberalization India, in the context of rapid economic growth and urbanization, through multi-scalar and comparative analyses of changing urban and peri-urban livelihoods, economies and ecologies. The programme examines urban development policies and practices from the perspectives of equity, social justice and environmental sustainability. It particularly focuses on the question of land – access, rights and use – in both rural and urban contexts, a complex problem with profound implications for the goal of creating sustainable habitats for all citizens. Projects under the UMS Programme have explored the entangled ecological and socio-economic impacts of the rapid urbanization of rural landscapes and the financialization of land in Bangalore and Andhra Pradesh, the housing crisis and rise of new rental economies engendered by real estate-led urban development, and

new pathways of rural-urban mobility driven by the demand for labour in the consumption-oriented urban service economy.

The Education Programme at NIAS emphasises the critical role that education and training play in any strategy for sustainability, ranging from the development of the necessary skills to efforts to improve gender relations. The programme has been sensitive to issues of equity, particularly the challenge of exclusion. It has studied several manifestations of exclusion, including the difficulties in providing equal access to all levels of education, building and upgrading education facilities, promoting effective learning environments, and adjusting to the ever-increasing enrolment in higher education. It has promoted a participatory approach through the "Social Exclusion and Education" project, the "MAIYA Prodigy Fellowship Programme" and the "Women and STEM Studies" project. The programme also seeks to be inclusive in other dimensions of learning, including abilities. This is reflected in its efforts at recognising and mentoring gifted children through the "Identification and Mentoring of Gifted Children aged between 3 – 15 years" project, and at promoting a nurturing environment for learning through the Advanced Learning Centres (ALCs).

INTERGENERATIONAL AND INTRAGENERATIONAL JUSTICE

Implicit in this approach to sustainability, which links the meeting of present needs to the ability of future generations to meet their needs, are issues of intergenerational justice. When speaking of justice across generations, it is difficult, perhaps even impossible, to make the sorts of comparisons necessary for an egalitarian evaluation. Plausibly, an egalitarian perspective would not even be desirable across generations, since the goal of sustainable development is presumably the improvement of material conditions from one generation to the next. Given both the theoretical difficulty and potential practical undesirability of an egalitarian perspective on intergenerational justice, a sufficientarian approach – focusing on attaining a basic threshold of well-being for each individual, rather than on comparing well-being across individuals – seems to be more appropriate. This might go some way towards justifying the report's emphasis on the notion of meeting needs, as opposed to some more robust egalitarian evaluation.

However, the Brundtland report conceives of sustainable development as a concept of justice not just for future generations but for the present generation as well. Issues of inter-generational and intra-

generational justice are elided when we speak of meeting present needs without compromising the ability to meet future needs. The framework prioritises the intergenerational question, and one consequence may be that any approach to justice within the present generation will have to conform itself to a discourse suitable for addressing the issue of justice across generations. In other words, because the problem of intergenerational justice lends itself to a sufficientarian (needs-based) solution, and because justice within the present generation must be conceived in a manner continuous and coherent with intergenerational justice, intragenerational justice must also be theorised as primarily focused on the meeting of essential needs.

A potential worry about this approach is that while comparative egalitarian notions of justice may not seem appropriate across generations, there is a stronger argument for a comparative understanding of equity within a particular generation. It is possible, then, that the appropriate ethical framework for addressing questions of justice in the present is not the same as that for addressing questions of our obligations to future generations. One response to this critique might be the development of a notion of sustainability that does not subordinate the intragenerational perspective to the intergenerational, that allows us to raise questions of substantive social and economic equality in the

present generation within the discourse of sustainable development.

Consideration of the relationship between intra-generational and inter-generational justice raises a further question: Is the relationship between justice for the present generation and justice for future generations necessarily best conceived as a trade-off between present and future interests? The answer to this question may be "yes" if one adopts a notion of sustainability where a preserved resource base is being employed to meet a constant set of essential needs across generations. On this conception, the way for each generation to ensure sustainability is to avoid excessive extraction of natural capital so that future needs are not "compromised". However, according to some other perspectives – the dependence of future needs on present decisions, the preservation of outcomes rather than resources – it may not be appropriate to conceive of the intergenerational problem simply as one of allocation or distribution across generations. If decisions we make about justice in the present could transform economic, social or technological conditions in a manner that alters either needs or the requirements for meeting them, it is perhaps possible for the relationship between generations to be positive-sum rather than a zero-sum competition for the same stock of resources. As a simple example, the

development of an effective public health system and the alleviation of disease burden in the present would not simply be a matter of utilizing resources so as not to compromise future needs, but may actually eliminate certain healthcare-related needs in future generations.

Even if we do conceive of the question of intergenerational justice in sustainable development as primarily one of distribution across generations, a number of issues call for resolution. We have already broached the question of what it is that is being distributed, considering natural resources and human well-being as two alternatives. There may be other alternatives as well – one may argue, for instance, following John Rawls, that the possibility of economic, political and social institutions that undergird a just social order must be maintained across generations; or, following Amartya Sen, that societally salient capabilities be equitably allocated. Whatever the currency of intergenerational justice, accounts of the processes through which just allocation is to be ensured must also be developed. A first requirement for this is identification of the relevant agents and their particular obligations. Should sustainability primarily be addressed at the national, the sub-national, or the international level? Presuming there are relevant obligations for action at each of these levels, defining these obligations and

how they interact should be a priority that calls for both theoretical/conceptual work as well as empirical work on the feasibility and effectiveness of particular processes and policies.

In developing an understanding of the obligations of different agents, an important question to keep in mind is whether sustainability as an ethical perspective should be seen purely in terms of the relationship between the present and the future, or whether consideration of how the past has shaped present circumstances is also relevant. In a world where historical access to and use of resources by different nations has been extremely lopsided, an intergenerational perspective may well have to extend its reach back towards the past, not just to the future, in articulating a plausible understanding of just distribution.

The need for sustainability research to pay specific attention to the contextuality and diversity of needs is, if anything, even greater in India, given the fact that the country is diverse, pluralistic and riven with major socio-economic inequalities. It is imperative that these differences and inequalities in people's lives and life prospects be taken into account when developing an understanding of sustainable development, but without rendering it impossible to formulate coherent national policy due to a lack of

basic agreement about what needs must be met. Here the prioritarian strain in the Brundtland report – the idea that the needs of worse-off segments of society be given overriding priority – might offer some guidance. The second major reason to pay attention to the problem of diversity of needs is that much of the academic discourse on sustainability originates in the developed world, and potentially does not fully capture needs stemming from the particular circumstances in a country like India. If India is to effectively represent the interests of its citizens in international forums, it is important to ensure that the conception of essential needs employed in that discourse (such as, say, in the UN Sustainable Development Goals) fully acknowledges and encompasses the potentially context-specific needs of Indians, especially the worst off among us.

Strong vs. Weak Sustainability

A related debate is about whether we should adopt a strong or weak conception of sustainability. Strong sustainability theorists argue that sustainability should fundamentally be about preservation of a specific resource base, understood as natural capital. Sustainability, on this view, requires preservation and maintenance of ecological systems. Weak sustainability theorists argue that what matters is ensuring the maintenance

and development of human quality of life. It need not be the case that this is best achieved by preservation of natural capital. If it is possible to replace naturally derived goods and service with artificial technological alternatives in a manner that is equally effective at meeting future needs, then that could be a possible pathway towards sustainable development. In other words, should sustainability be focused on the preservation (and possibly enhancement) of a particular stock of resources, or of certain outcomes? The Brundtland report is ambiguous on this question. While the definition of sustainability in terms of meeting needs might suggest an emphasis on outcomes, the report also states that the "first priority is to establish the problem of disappearing species and threatened ecosystems on political agendas as a major resource issue", suggesting a more resource- than outcome-oriented perspective.

The disagreement regarding strong and weak sustainability is tied to the question of anthropocentrism. Proponents of strong sustainability argue that concern about sustainability should not merely be about the well-being of human beings, present and future; it should also take into account the well-being of other species, and potentially even the intrinsic value of ecosystems. Even if replacing ecological resources with other forms of capital could maintain a certain level of

consumption for human beings, it would potentially threaten non-human animals as well as further alienate human beings from their natural surroundings. The Brundtland report appears to endorse non-anthropocentrism, arguing that conservation should not just be about meeting "development goals", but also about fulfilling "our moral obligation to other living beings". The anthropocentric perspective argues for the primacy of human well-being and human needs, and consequently regards any understanding of sustainability that would sacrifice a significant degree of human development for the purpose of environmental conservation to be inadequate.

TOWARDS AN INSTITUTIONAL STRATEGY FOR THE STUDY OF SUSTAINABILITY

As this short note has attempted to illustrate, fundamental conceptual issues abound when the discourse on sustainability is examined in any detail. The proliferation of alternative accounts of sustainability, and the philosophical and empirical disagreements underlying the diversity of perspectives, present a challenge for those of us invested in the notion of just and sustainable development. The first step to meeting this challenge is clearly articulating the major points of contention and envisioning the possibilities for consensus. These tasks call for rigorous and collaborative work from multiple disciplinary perspectives. Even as multiple programmes at NIAS have dealt with issues that would be relevant to an understanding of sustainability, these have typically been by-products of studies with other primary concerns. To use this base to make a more substantial contribution to the understanding and practice of sustainability it is essential to focus directly on issues that focus primarily on "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

In charting a more specific course for NIAS to follow we can draw on the three goals the Brundtland report identifies for the exploration of sustainability: protecting the environment, preserving economic growth, and ensuring equity. The experience of NIAS suggests that there may, however, be merit in taking a broader view of these three goals. It is particularly important not to slip into some form of economic determinism. This would be particularly true of the goal of preserving economic growth. The needs of the present and future generations cannot be reduced to their economic dimensions alone. There could also be other considerations, such as social harmony, that could be no less important]components of the needs of a society, both present and future. Such a broader

notion would also bring into consideration issues of security at the individual and social levels, between and within societies. The term "preserving" too would need a broader understanding, as it would extend beyond preserving the present for the future to also preserving the past for the future generations. We could then restate the three goals as protecting the environment, preserving and improving the material and non-material quality of life, and equity in all its dimensions.

While these goals cover most, if not all, aspects of sustainable development they do not tell us enough about how they can be achieved. The pursuit of these goals over the three decades and more since the Brundtland report have seen a variety of factors altering the course of the debate and the practical measures that have been taken by governments. Arguably, the most visible of these factors have been the political. Individual, social and political power have played critical roles in the course of the debate on sustainability. The Sustainable Development Goals (SDGs) of the United Nations were the result of extensive international political bargaining. At more local levels individual, social and political power have had a major influence on the pursuit of specific goals. The strategies followed to preserve improvements in the quality of life, especially its economic aspects, have been deeply influenced by the politics of those in power. The pursuit of specific notions of equity, and the extent to which they have been implemented, is also the result of power at multiple levels. The extent and nature of the protection of the environment too has been deeply influenced by the local and national political power.

Technology has also had a role to play in the pursuit of the three broad goals of sustainable development. The processes of technological change have at times been sustainability augmenting, as when they result in higher emission standards. Equally, technology has also been sustainability diminishing, as in those technological developments that lead to higher carbon emissions. In either case technology plays a significant role in the protection or otherwise of the environment. Technology also has a dominant place in determining the quality of life of members of a society, with the technologies of globalization, in particular, substantially reducing the effects of distance. In this milieu of multiple and diverse technologies a great deal also depends on how technologies are perceived by individuals and groups in a society. This perception is, in turn, deeply influenced not just by the process of the evolution of technologies, but equally or more by how they are communicated to potential users.

If we argue, going with JD Bernal, that "A technique is an individually acquired and socially secured way of doing something; science is a way of understanding how to do it in order to do it better" (Bernal, 1969, p. 47), then the development of technology is linked to the larger domain of knowledge. This domain would, in fact, cover not just what is commonly seen as science, but all knowledge that determines what questions we ask and how we choose to answer them. This knowledge would then extend not just beyond the physical and biological sciences to the social sciences and humanities, but also to traditional systems of knowing. This would be particularly true of the goal of protecting the environment where tribal communities have been known to have great insights.

Thus the pursuit of the three goals of sustainable development – protecting the environment, preserving and improving the material and non-material quality of life, and equity in all its dimensions – is in each case influenced by the nature of political, social and economic power, the course of development of technology and the overall development and recognition of knowledge. This process is then best seen as a matrix. Each of the elements in this matrix represents the interaction between a goal of sustainability in the columns and the processes influencing the pursuit of those goals in the rows. Examples of these interactions are given in the place for each element. Needless to say, these examples are by no means a comprehensive list.

	Protecting the environment	Preserving and improving the material and non-material quality of life	Equity in all its dimensions
Nature of political, social and economic power	Environmental movements	Eco-friendly growth strategies, preserving heritage, inclusive growth	Politics of intergenerational equity
Course of development of technology	Environment sensitive technologies	Communication of environment sensitive technologies, technoethics	Technologies that reduce economic differences
Development and recognition of knowledge	Developing new knowledge on biodiversity and conservation, understanding and protecting traditional knowledge of the environment	Studies of non-material quality of life, studies of different paradigms of growth and development	Interaction between ideas of equity in the past and the present

An effective institutional strategy to study sustainability would then seek specific projects that meet two conditions. The first condition is that they must be broadly consistent with the idea of meeting "the needs of the present without compromising the ability of future generations to meet their own needs." The second condition would be that they focus on one or more of the elements of the matrix for the study of sustainable development. NIAS would have to also create the appropriate institutional mechanism to evaluate these proposals and seek funding for those that are believed to be consistent with the institutional commitment to the study of sustainability.

Works Cited

Bernal, J.D 1969. *Science in History* Vol I, Harmondsworth: Penguin.

Brown, Becky J., Mark E. Hanson, Diana M. Liverman, and Robert W. Merideth, Jr. 1987. "Global Sustainability: Toward Definition" *Environmental Management* 11 (6): 713-719.

Doyal, Len and Ian Gough 1991, *A Theory of Human Need*. Basingstoke and London: Macmillan.

Kidd, Charles V. 1992. "The Evolution of Sustainability" *Journal of Agricultural and Environmental Ethics* 5(1): 1-26.

Miller, David 1999. *Principles of Social Justice*. Cambridge, MA and London: Harvard University Press.

Nocca, Francesca 2017. "The Role of Cultural Heritage in Sustainable Development: Multidimensional Indicators as Decision-Making Tool" *Sustainability* 9 (10): 1-28.

Rawls, John 1971. *A Theory of Justice*. Cambridge, MA: Belknap Press.

Reader, Soran 2007. *Needs and Moral Necessity*. London and New York: Routledge.

Sen, Amartya 1999. *Development as Freedom*. Oxford and New York: Oxford University Press.

United Nations Educational, Scientific and Cultural Organization (UNESCO) 2008. *World Heritage Information Kit*, Paris: UNESCO World Heritage Centre, available from https://whc.unesco.org/document/102072.

World Commission on Environment and Development (WCED). 1987. *Our Common Future*, Oxford and New York: Oxford University Press.

Document Control Sheet

1. **Document No. and Year**   :   NIAS/ U/ RR / 09/2020

2. **Title**   :   Towards an Institutional Strategy for the Study of Sustainability

3. **Type of Document**   :   Research Report

4. **No. of Pages and Figures** :   16 pages, 1 Table

5. **No. of References**   :   11

6. **Authors**   :   Narendar Pani, Tarun Menon, Nithin Nagaraj,
Tejal Kanitkar and Srikumar Menon

7. **Originating school**   :   None

8. **Programme**   :   None

9. **Collaboration**   :   None

10. **Sponsoring Agency**   :   None

11. **Abstract:**

Over the last three decades, NIAS has evolved as one of India's leading multidisciplinary research and training institutions. It has, during this period, built on its mandate to carry out multidisciplinary research and to use the results of that research to help build a new leadership in India. A major step in this direction was taken by focusing on specific initiatives, drawing on inputs from multiple disciplines. The practice of multidisciplinary research has, over time, thrown up not just answers to questions that have been asked about diverse aspects of the country, but also raised new questions. Some of these questions have been recurring, arising again and again in the course of multidisciplinary research in very different directions. Among the more frequent of these recurring questions are those that relate, directly or indirectly, to issues of sustainability. A strategy for national security would self-destruct if it used resources in a manner that was not sustainable; the protection of our heritage can be seen as a response to the need to sustain memories of our past; the need to study inequality comes from an understanding that grossly unequal societies are not sustainable; and so on. As individual programmes have responded to these challenges, an institute-wide approach to sustainability has evolved from below. This note seeks to make this approach explicit by placing it in the context of the larger debate on sustainability. It then goes on to develop this approach into a strategy to enhance the contribution of NIAS to the larger cause of sustainability, in the realms of theory, empirical evaluation, and policy.

12. **Keywords**   :   Sustainability, Brundtland Report,
Intergenerational Transfer, Equity

13. **Security Classification**   :   Unrestricted

14. **ISBN**   :   Nil