Application of solar energy in South Asia: promoting intergenerational equity in climate law and policy

Stellina Jolly
Faculty of Legal Studies,
South Asian University (SAARC),
Akbar Bhavan, Chankyapuri, New Delhi 110023, India
E-mail: stellinajolly@sau.ac.in

Abstract: The blackout which left over 600 million people without power in India have correctly highlighted the pitfalls of depending on a carbon centric energy source. In fact, the entire South Asia has been experiencing the social, economic, and environmental effects of fossil fuel dependence including energy crisis, dramatic fluctuations in oil price, polluted atmosphere and finally the documented consequences of climate change. The climate concern has propelled renewable energy technologies into the mainstream to a greater extent than ever before, due to their ability to provide an alternative energy path. This paper contends that climate change is not merely an environmental issue but a social and human right issue of equity between generations. This paper critically looks at how far the concept of intergenerational equity has been made part of international climate law and policy. This paper discusses how dissemination of solar energy has the potential to advance intergenerational equity and mitigate the climate change effects in South Asia.

Keywords: intergenerational equity; climate change; solar energy; South Asia; environment; international law.


Biographical notes: Stellina Jolly is an Assistant Professor with South Asian University, She has authored a reference book on climate change, changing dimensions of law and policy, and relationship between technology and women from a legal and policy perspective. Her research interests include international environmental law, bio ethics, and legal theory. She is on the board of reviewers of reputed journals. She has been associated with various organisations and institutions in a number of projects including Rajiv Gandhi Foundation.

1 Introduction

The inspiration for this paper came from the discussion I had with other delegates attending the sustainable development and climate change conference in Delhi. Climate change is one of the pressing issues which have gathered political, economic, scientific and legal attention of our time. The major reason which can be ascribed for this
catalogue is the unregulated and ruthless amount of anthropogenic gases released into the atmosphere beginning with industrialisation by the developed world. The effect of this misguided development strategy followed by the previous generation is expected to have serious impact on the earth’s climate and existence of various nations and humanity in the time to come. Climate change is not merely an environmental issue but one which strikes at the existence of present generations and seriously prejudices the rights of future generations. In other words climate change is an issue of equity between not just present generations but between generations too. Sustainable development strategy is thought to be an answer to this crisis and inter-generational equity is one of the foundational components of sustainable development. According to Patricia Bimie and Allan Boyle sustainable development contains seven different elements: integration of environmental protection and economic development, the right to development, sustainable utilization and conservation of natural resources, intergenerational and intergenerational equity, the polluter pays principle, and finally some procedural elements.1

The Bruntland report also recognises intergenerational equity as a cornerstone of sustainable development.2 This paper critically analyses how far the concept of intergenerational equity has been made part of international climate law and policy. The paper discusses how dissemination of solar energy has the potential to advance intergenerational equity and mitigate the climate change affects in south Asia.

2 Intergenerational equity: cornerstone of climate justice

Initially, climate change came to the international arena as a scientific and environmental concern. Intergovernmental Panel on Climate Change (IPCC) report highlighted that earth’s climate is changing.3 What are the impact and consequences of this climate change, experts predicts that as ice caps and glaciers melt, sea levels are expected to rise.4 The effects of sea level rises of high magnitude may include widespread coastal flooding; loss of agricultural land and threat to the existence of many island nations.5 Climate change will, among other impacts, increase the severity of droughts, land degradation, desertification, the intensity of floods and tropical cyclones, the incidence of malaria and heat-related mortality, and decrease crop yield and food security. At stake are basic elements of human life concerning access to water, production of food, health matters and habitation issues.6 It is crucial to underline here that the effects of climate change will be distributed unevenly around the world. Whereas few developed countries can feel some benefits depending on the scale of global warming, the poorest nations will experience extremely adverse effects almost immediately.7 The uneven effect of climate change is not merely geographical in nature. The IPCC notes: Climate change impacts will be differently distributed among different regions, generations, age classes, income group, occupations and genders.8

The IPCC report confirms the view that climate change is a serious equity issue between generations. In fact, the onset of global warming, though rapid in geological terms, is likely to be rather leisurely in historical terms. Realisation of severe potential impacts is unlikely to occur in a widespread fashion for decades to come. The most extreme damages are expected to occur in the far distant future, perhaps one, two or even three centuries from now.9 Thus, intergenerational equity is at the heart of climate change
discourse. There cannot be any sustainable and equitable climate change legal regime which does not recognise and incorporate adequate provisions for the protection of future generations. The major aim of the paper is to analyse how far climate change legal regime accommodate the concern of future generations. But before going into the details, it is imperative to discuss how historically and traditionally law has dealt with issues of inter-generational equity both under international law and under South Asian Jurisdictions.

3 Intergenerational equity under international law

Traditionally, the law was concerned with orderliness in society existing within the context of same generation. The rights and duties of future generations were of very limited concern. For instance, some legal systems for the purpose of succession to property ranted inheritance right to unborn and child in the womb. But criminal law was more conservative even denying the concept of person hood to any one before his or her birth. Same approach was followed by international law which focused on interrelations co-existence, and cooperation between nation state inter-alia of present generations. Lately, issues like racial discrimination and consequent genocide, cultural and heritage eliminations came into the forefront forcing the international community to look beyond the current generation. Environment protection is the latest entry to the list of issues requiring attention to more than one generation. It was felt by the international community that since the effect of our actions spill over to future generations, the concept of equity and justice requires taking into account the special needs and concerns of future generations.

The term ‘intergenerational equity’ made it appearance in the context of law explicitly after Stockholm declaration. Intergenerational equity was interpreted differently and meant and denoted different things to different people. For Frishman intergenerational equity was a ‘principle of distributive justice.’ As a principle of distributive justice it is concerned with proper utilisation and benefit sharing of resources spanning across generations. Weiss, one of the prominent exponents considers Intergenerational equity as part of trust obligation. The trust “obligates each generation to preserve the diversity of the resource base and to pass the planet to future generations in no worse condition than it receives it.” Thus, the present generation serves both as a trustee for future generations and as a beneficiary of the trust.

With regard to inter-generational equity, it is not difficult to locate treaties and documents bearing some reference to rights and obligations of future generations. The preamble to the charter of United Nations which aims “to save succeeding generations from the scourge of war is a testimony to this development.” Other documents are numerous in number including the International Covenant on Civil and Political Rights, the Convention on the Prevention and Punishment of the Crime of Genocide and many other human rights documents reveal a fundamental belief in the dignity of all members of human society and in an equality of rights that extends in time as well as space. Indeed, if we were to license the present generation to exploit our natural and cultural resources at the expense of the well-being of future generations, we would contradict the purposes of the United Nations Charter and international human rights documents.

Specifically in the context of environment protection intergenerational equity made its appearance and acceptance with the Stockholm Declaration. For example, in the
Stockholm Declaration, Principle 1 states that “man (...) bears a solemn responsibility to protect and improve the environment for present and future generations, and Principle 2 states that “the natural resources of the earth (...) must be safeguarded for the benefit of present and future generations.” The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) mentions, in its preamble, that “wild fauna and flora in their many beautiful and varied forms are an irreplaceable part of the natural system of the earth which must be protected for this and the generations to come.” The most widely known definition of the inter-generational equity can be ascribed to the 1992 Rio Declaration Principle 3 of the Rio Declaration provides that “the right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.” The Copenhagen Declaration, which accompanied the Programme of Action of the World Summit for Social Development, declares that states are to fulfil their “responsibility for present and future generations by ensuring equity among generations.” In addition, attention was paid to the issue of intergenerational equity through the UN General Assembly Resolution 35/8 which proclaimed “the historical responsibility of states for the preservation of nature for present and future generations.”

Specific contours of intergenerational equity are further clarified by the UNESCO Declaration on the Responsibilities of the Present Generations toward Future Generations, which focuses on our obligations to future generations. The Declaration covers intergenerational aspect of not only environmental matters but encompasses cultural and social aspects also. Relevant article pertaining to environment conservation is elaborated below. Article 1 lays down that the present generations have the responsibility of ensuring that the needs and interests of present and future generations are fully safeguarded. Similarly, Article 5 elaborates on the principle that to ensure to future generations the richness of the Earth’s ecosystems, the present generations should strive for sustainable development and preserve living conditions, particularly the quality and integrity of the environment. Clause two lays down a further duty on the present generations to ensure that future generations are not exposed to pollution which may endanger their health or their existence itself. Clause three and four mandates the present generations to preserve for future generations natural resources necessary for sustaining human life and for its development and a duty to take into account possible consequences for future generations of major projects before these are carried out. Intergenerational equity finds its mention in the innumerable documents of environmental protection. In fact, it will not be wrong to conclude that intergenerational equity is one of the major objectives of all major environmental declarations and conventions.

4 Intergenerational equity principle under South Asian jurisdiction

Environmental Jurisprudence made a beginning in the mid-'70s after the Stockholm declaration in South Asia. Indian parliament and judiciary acted as the pioneers in the movement. Environmental movement in India started when the parliament in order to fulfil its international obligations enacted the Water (Prevention and Control of Pollution) Act, 1974. Later in 1976, India incorporated Article 48-A in the Directive Principles of State Policy and Article 51-A (g) in the Fundamental Duties of every citizen of India.
Both these articles unequivocally provide for protection and improvement of the environment. During ‘80s and ‘90s, Indian judiciary saw a flurry of cases dealing with environment. This was the combined result of environmental awareness and the encouragement given to public interest litigation (PIL) by Indian Judiciary. Judiciary responded effectively in granting relief to the affected parties though the enunciation of right to clean environment even though it was never explicitly declared a fundamental right under Indian constitution. Two strands are noticeable in these judicial decisions. Firstly, judiciary interpreted right to life guaranteed under the constitution as containing right to clean environment. Secondly in the pursuit of granting effective remedy judiciary advanced and incorporated the environmental principles including intergenerational equity, contained in the multitude of environmental declarations.

In some of the environmental cases, the Supreme Court of India took account of the principle of intergenerational equity. In forbidding limestone mining operations in the downhills of Himalaya the Supreme Court of India took into account the interests of future generations in the nature of Himalayan ecosystem. In a landmark case involving coastal regulation, the Full Bench of the Supreme Court observed,

“A law is usually enacted because the Legislature feels that it is necessary. It is with a view to protect and preserve the environment and save it for the future generations and to ensure good quality of life that the Parliament enacted the Anti-Pollution Laws, namely, the Water Act, Air Act and the Environment (Protection) Act, 1986.”

Similarly in Ganesh Wood Products, the court mentioned the right along with the well settled Principle of Sustainable Development. The court observed,

It is also violative of the National Forest Policy and the State Forest policy evolved by the Government of India and the Himachal Pradesh Government respectively – besides the fact that it is contrary to public interest involved in preserving forest wealth, maintenance of environment and ecology and considerations of sustainable growth and inter-generational equity. After all, the present generation has no right to deplete all the existing forests and leave nothing for the next and future generations.” As is evident, in both cases, the Supreme Court has only relied on the right to intergenerational equity along with some other entrenched right. Neither case derives its reasoning directly or solely from the right to intergenerational equity.

Following the Indian example, the trend to protect environment gathered momentum in other south Asian jurisdictions. Judiciary in these countries played an active role, though it could not generally achieve the same rate of success achieved by Indian judiciary. An analysis of the constitutional provisions of other South Asian countries of Pakistan, and Bangladesh, Sri Lanka and Nepal reveals that their constitution does not contain explicit provisions granting fundamental right to clean environment, though some provisions relating to environment do find mention in parts of constitutions. But the judiciary through a broader interpretation has curved out the right to clean environment form other valid constitutional provisions. In the case of Shehla Zia v. WAPDA Pakistan judiciary declared that Article 14 of the constitution provides that the dignity of man and subject to law, the privacy of shall be inviolable. Art 9 guarantees the fundamental right to preserve and protect the dignity of man and right to ‘life’. Court held that if both are read together, question will arise whether a person can be said to have dignity of man if his right to life is below bare necessity line without proper food, clothing, shelter,
education, health care, clean atmosphere and unpolluted environment.” Similarly in Bangladesh Right to have a clean environment has been enunciated by judiciary as part of constitutional right to life in the landmark case of M. Farooque v. Bangladesh and Others. In this case, petitioner also submitted that they represented not only the present generation but also the generation yet unborn, the court, however, did not agree. Intergenerational equity, though pleaded, the court did not apply this principle on the ground that neither the constitution nor the national legislation of Bangladesh explicitly mentions this principle. In Srilanka in Wattegedera Wijebanda v. Conservator General of Forest and Eight Others, court noted that while environmental rights are not specifically alluded under the category fundamental rights the right to clean environment and intergenerational equity with respect to protection and preservation of the environment are inherent in a meaningful reading of constitution. The discussion reveals that South Asian countries has carved out the right to a clean environment but fell short of making intergenerational equity as part of their enforceable constitutional rights.

5 Implementing intergenerational equity in climate change: legal and normative issues

Climate change is an issue of intergenerational equity. The climate policies that the present generation chooses now will be important for generations that live hundreds and thousands of year from now. With specific to climate regime The United Nations Framework Convention on Climate Change (UNFCC) declares that: “Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity.” According to Article 2 of the UNFCC, the objective of international climate change policy is the ‘stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.’ The interest of future generation is inherent here. The common but differentiated responsibility reflected in UNFCC and Kyoto has an innate respect for equality. Article 3.1 of the UNFCCC, international climate change policy must reflect the ‘common but differentiated responsibilities and respective capabilities’ of developed and developing countries. These principles have an innate respect for equity. The carbon reduction target prescribed for various developed nations is with the ultimate aim that climate change can be stabilised and if possible be reversed for the future of humanity. In principle, intergenerational equity is an inherent principle of climate legal regime. But the same cannot be said of the varied modalities and strategies for achieving climate change.

Implementing and conceiving policies of intergenerational equity in the context of climate change is beset with certain ethical practical and legal problems. Firstly, it is generally accepted that the concept of equity has certain basic components which includes question of responsibility, equal endowments, capacity, needs, etc. Responsibility refers to who has to be blamed in a situation. Equal endowments refer to the equal rights and distribution of goods and services. Capacity denotes there are differences between individuals and most able should contribute proportionately for the public good. These principles of equity have to apply in relation to climate change and interests of future generations. Future generations will have no responsibility for the climate problem unless and until they also follow a carbon centric development path.
They too are entitled to a fair share of carbon space. Their capacity to act in respect of climate change is, by definition, unpredictable at least in the long term. From their perspective, their basic needs will be no less important than ours; nor would they be likely if asked to accept a disproportionate share of the burden of effort.49

Some of the practical issues associated with implementing intergenerational equity has been highlighted by Weiss. According to him, the three principles of intergenerational equity are options, quality, and access.50

- The first, comparable options, means conserving the diversity of the natural resource base so that future generations can use it to satisfy their own values.51 Climate change is expected to threaten food security, access to water, bio-diversity, etc. making it difficult for the future generations to have enough options to satisfy their requirements.

- The second principle, comparable quality, means ensuring the quality of the environment on balance is comparable between generations.52 Unless and until drastic actions are taken to stabilise or reverse the trend of climate change we will be bequeathing to the future a polluted atmosphere which lacks quality in all comparisons.

- The third one, comparable access, means non-discriminatory access among generations to the Earth and its resources. These three principles engender planetary rights and planetary obligations.53 The course and extent of climate change is unpredictable. Even at present clime change has a differential impact on people on the basis of gender, income, etc. Same differential impact is expected to continue in future making the equal access to resources extremely difficult.

These fundamental principles form the basis of the planetary obligations. The first duty can be called a duty to conserve resources denoting the obligation of the present generation to conserve the natural and cultural resources in the earth for the use and benefit of future generations.54 The second duty is to ensure equitable use that “may be defined as reasonable, non-discriminatory access to the legacy.55 The third duty is to avoid adverse impacts,56 the fourth duty is to prevent disasters, minimise damage and provide emergency assistance and the fifth duty is to compensate for environmental harm.57

The thrust of planetary obligations impose duty on the present generations to protect, preserve and promote future generations’ rights on the resources. Since right and duties are always correlative, Duty on the present generations indicate corresponding right of future generations.58 Weiss highlights the need to give rights to future generations, stating: [L]imitations [on the present generation] should be applied very narrowly, lest the rights of future generations develop into an all-purpose club to beat down any and all proposals for change.59 The arguments of Weiss and others point out a right duty relationship between present and future generation in elaborating intergenerational equity. This argument give rise to certain inconvenient questions like can there be right for infinity, who will claim the right on behalf of future generations and whether non-living creatures can they claim to have rights.

There are basically two model advocated for the application of intergenerational equity. The first boundary consists of the preservationist model, where “the present generation does not consume anything; rather it saves all resources for future generations and preserves the same level of quality in all aspects of the environment.60 The second
boundary is made of the opulent model, “in which the present generation consumes all that it wants today and generates as much wealth as it can, either because there is no certainty that future generations will exist or because maximising consumption today is the best way to maximise wealth for future generations.” Both these approaches have its drawbacks. The first model is impracticable in the face of consumerist society. The fundamental flow in this approach is that if we are saving resources for future and all the coming generations also decide to save, life and development will be difficult. Regarding the second approach it cannot be said with certainty that maximising consumption will have the prospect of creating wealth in future.

In spite of the strong growth of international and national instruments pronouncing intergenerational equity, the legal and normative status of intergenerational equity is still clouded in doubt. To begin with, article 38 of the statute of International Court of Justice (ICJ) list out treaties, customs, general principles of law recognised by civilised nations and judicial decisions as the sources of international law. For intergenerational equity to qualify as a legal rule it has to satisfy the test and requirement of any of these sources. Though there are multitude of declarations and conventions recognising the principle of intergenerational equity. Most of it is in the form of soft law. The international law makes a clear distinction between hard law and soft law. The term hard law refers to legally binding obligations that are precise or can be made precise through adjudication or the issuance of detailed regulations and that delegate authority for interpreting and implementing the law. Soft laws are forms of legalisation that is, various combinations of reduced precision, less stringent obligation, and weaker delegation. Many people are sceptical of the increasing use of soft law mechanisms especially in international environmental governance. Prosper Weil, argues that increasing use of soft law “might destabilise the whole international normative system and turn it into an instrument that can no longer serve its purpose.” The wordings of intergenerational equity in declarations and judicial interpretations shows that it cannot be accepted and captured in the category of hard law, but qualify the soft law requirements.

Further deliberation centres on whether intergenerational equity qualifies as a custom or general principle of law recognised by civilised nations. To be considered as a custom, a norm has to constitute a general practice accepted as law. The Statute of the ICJ defines customary international law as “evidence of general practice accepted as law.” Regarding intergenerational equity it appears that in terms of state practice and opinion juries the distinctive legal content of intergenerational equity has become obscured and appears to have been mixed with the concept of sustainable development. With respect to intergenerational equity there simply is no customary norm, nor is there any “general and consistent practice of states.” While some groups attempt to show that there is a trend to accept intergenerational equity in jurisdictions which cannot be taken as a clear indication. According to Brown Weiss, the right to intergenerational equity constitutes an emerging norm of customary international law imposing on humanity; an erga omnes duty as trustee for succeeding generations to preserve global environmental diversity and quality.

The general principles of law recognised by civilised nations serve as a third source of international law. These are general principles that can easily be located and apply in all major legal systems. Though intergenerational equity has been accepted in some jurisdictions it will be erroneous to conclude that it has acquired general acceptance and universal recognition required for the establishment of general principles.
An investigation of judicial verdicts points that the intertemporal concept in law was articulated for the first time in the celebrated case of *Island of Palmas Arbitration* decided as back as in 1928. The subject of the dispute is the question of sovereignty over a small Pacific island between the United States and the Netherlands over sovereignty of the small Pacific island. Similarly, Judge Weeramantry opinion in the *Maritime Delimitation in the Area Between Greenland and Jan Mayen Case*, that “respect for these elemental constituents of the inheritance if succeeding generations dictated rules and attitude based upon a concept of an equitable sharing which was both horizontal in regard to the present generation and vertical for the benefit of generations yet to come” is noteworthy and support the acceptance of intertemporal aspect under public international law.

Subsequently, the ICJ had real occasion to debate on the specific issue of intergenerational equity, its normative and legal significance. Adding to his earlier interpretation of intertemporal aspect judge Weeramantry in the 1995 Nuclear Tests Case specifically mentioned the principle of intergenerational equity, saying that it is ‘an important and rapidly developing principle of contemporary environmental law which must inevitably be a concern of this court.’ In the Case of Gabčíkovo-Nagymaros, involving Hungry and Checkoslovakia over a hydro project aimed at eliminating flooding and to provide electric power, the court states that throughout the ages, mankind has, for economic and other reasons, constantly interfered with nature. In the past, this was often done without the consideration of the effects upon the environment. Owing to new scientific insights and to a growing awareness of the risks for mankind – for present and future generations – of pursuit of such interventions at an unconsidered and unabated pace, new norms and standards have been developed.

Judge Christopher Weeramantry showed his concern for the environment in eloquent terms He wrote:

> Examples may be cited from nearly every traditional system, ranging from Australasia and the Pacific Islands, through Amerindian and African cultures to those of Ancient Europe.... These varied cultures were reflecting the ancient wisdom of the human family which the legal systems of the time and the tribe absorbed, reflected and turned into principles whose legal validity cannot be denied.”

The trend of international judicial decisions shows that though some acceptance has been given to the concept of intergenerational equity, its legal position as to principle, rule or concept has not been made clear. In spite of the multitude of documents incorporating intergenerational equity the concern is that there is no clarity on what exactly are the contours and requirements of implementing intergenerational equity making it ambiguous for policy makers and institutions. Any steps to incorporate intergenerational equity strategy in climate mitigation and adaptation will have to overcome these obstacles. In this context, renewable energy spearheaded by solar energy offer some great potential.

### 6 Solar energy for South Asia: feasibility of promoting intergenerational equity

India suffered the worst blackouts in history this week, which left over 600 million people without power. First, it was the northern grid collapse which affected almost eight states of Northern Indian. Less than 24 hours after the power has been restored there was
failure of three grids serving India’s northern, eastern and north eastern regions. Various explanations poured in ranging from lack of infrastructure development, overuse, underutilisation and mis-management. When it comes to other South Asian countries, situation does not look very promising either. South Asian nations are facing rapidly increasing demand for energy coupled with insufficient energy supply. They are energy-deficit countries and fighting with energy shortfalls in the form of recurrent, costly, and widespread electricity outages.

To meet the growing aspirations of the people and economies of South Asian, improving the supply of energy, particularly the supply of electricity, is an important priority of regional governments. An analysis of South Asia’s energy generation and consumption brings the picture of an energy system that is exceedingly carbon centric. Energy use is dominated by coal (49%), followed by petroleum fuels (35%) and natural gas (9%). For Bangladesh Biomass, together with gas, oil and coal, is one of the main sources of energy. The primary energy source in Nepal is fuel wood. For Sri Lanka major energy source is biomass, petroleum and hydro power. Pakistan’s commercially exploitable energy resources consist of coal, gas, oil, hydel power, nuclear power and a large base of traditional fuels in the form of fuel wood, agricultural and animal wastes.

The carbon centric energy profile suffers from certain inherent drawbacks and makes a case for shifting to renewable energy sources. Firstly, using non-renewable energy sources reduce the stock of stored energy available for future generations. Secondly, there is an environment perspective to it. The fossil fuels are environmentally damaging. While average greenhouse gas emissions of South Asia are a relatively low 3.0 t CO₂ equivalent per person per year, the total greenhouse gas emissions of the South Asia region accounted for 13.1% of global emissions in 2000. To make matters worse greenhouse gas emissions from energy use contributed 55% of the total emissions in South Asia.

The geophysical and climatic conditions of the South Asian nations (SAARC) region have allowed a rich endowment of natural resources. The judicious use of these resources would contribute to the continued well-being of its people and future generations. But reports also suggest that South Asia is one of the most vulnerable regions of the world. Climate change is expected to have a severe impact on South Asia. The likely impacts of climate change in the form of higher temperatures, more variable precipitation, and more extreme weather events are already felt in South Asia. A responsible climate change policy should take into account the principles of energy conservation and efficiency. Because of its favourable tropical geographic location, South Asian countries have a lot of potential for tapping solar energy. India is largely located in the equatorial sun belt of the earth, thereby receiving abundant radiant energy from the sun. Just 1% of India’s land area can meet its entire electricity requirements up to 2030. Secondly, the country’s very size permits a rapid build-up of capacity to levels that can allow significant economies of scale. For Pakistan, the mean global irradiation falling on horizontal surface is about 200–250 watt per m² in a day. This amounts to about 1,500–3,000 sun shine hours and 1.9–2.3 MWh per m² in a year. Similar solar potential exist for other South Asian countries too.

Certain legal and policy measures have already been taken in most of the south Asian nations. India pioneered the solar program in South Asia. Ministry of Non-Conventional Energy Sources (MNES) has been implementing various solar energy programs in the country with the objective of providing electricity to the rural and remote areas.
energy policy in India is majorly in the form of financial incentives, regulatory incentives and policy initiatives. Ministry has also been implementing solar thermal power generation program having the following components of Solar cooking, Solar Dyers, Rural electrification. Access to electricity is also on the prime agenda of solar initiative currently; about 3000 villages have been electrified, primarily through solar systems. The Government of India’s National Action Plan on Climate Change released in mid-2008, identifies eight critical missions – one of which is the National Solar Mission. The mission aims at the development of a solar industry competitive with fossil fuels within the next 20–25 years. Specifically, it aims to achieve the goals of 10,000 MW of installed photovoltaics (PV) capacity by 2020.

Efforts are being taken in other south Asian countries to promote solar energy. Pakistan introduced the Policy for Development of Renewable Energy for Power Generation in 2006. This is Pakistan’s first energy policy aimed specifically at the promotion of renewable energy power projects. The goal under this policy is to provide 10% of Pakistan’s energy supply mix by 2015. The policy focuses on solar energy, wind energy and small-scale hydro power projects. Bangladesh set out the climate change strategy and action plan to advance in ‘globally cooperative actions’ and achieve national goals for clean energy, forestry, energy efficiency, and knowledge creation and dissemination to address priority climate challenge risks. Other countries including Nepal and the Maldives have recently developed national climate change committees. Sustainable Energy Authority Act to develop renewable energy resources, to declare energy development areas, to implement energy efficiency measures and conservation programmes, to promote energy security, reliability and cost effectiveness in energy delivery and information management came into operation in 2007 in Sri Lanka. Though some significant progress has been made in the solar field, several issues needs to be addressed including perceptions of high costs, limited access to the latest technology, institutional capacity constraints, etc. In fact, providing solar energy at cheaper rate remains the biggest barrier in promoting solar.

In South Asia after the formation of SAARC, there has been cooperation among states to address climate change. Though there are differences between states in other issues, SAARC countries have generally cooperated with each other at regional level and also global level in the issue of climate change. In the third meeting of the SAARC Environment Ministers, the SAARC Environment Action Plan was adopted to identify the key concerns and set out for regional cooperation. Dhaka declaration and SAARC action plan on climate change in 2008, where states called for pursuing a climate change resilient South Asia. Thimbu declaration agrees to establish an inter-governmental expert group on climate change to develop clear policy direction and guidance for regional cooperation as envisaged in the SAARC Plan of Action on Climate Change. It also proposed a commission a study to explore the feasibility of establishing a SAARC mechanism which would provide capital for projects that promote low-carbon technology and renewable energy; these are few examples of how SAARC countries have cooperated to work towards environmental issues and climate change.

Solar energy schemes and plans seek to make a shift from the carbon centric energy pattern to promote clean, sustainable, environmental friendly and equitable energy source. Use of solar can augment the intergenerational equity component in climate change. The basic premise of intergenerational equity is the objective utilisation and sharing of resources between generations. The first fundamental principle of ‘options’ in intergenerational equity can easily be fulfilled by solar as it is not depleting in nature.
Solar energy is constant, so future generation will not have less resources compared to the present generation to satisfy their needs. Besides the very use of solar indicates less dependency on non-renewable energy sources which will have the effect of making available the options of non-renewable energy to future generations which otherwise would be depletable. Second principle of quality will also be satisfied, since solar is said to be having the least GHG emission compared to conventional non-renewable sources of energy. If we continue our present rate of carbon centric energy pattern we will be bequeathing to our progeny an atmosphere which is polluted and contaminated. The use of solar energy will not be affecting or lowering the quality of atmosphere, resources and environment for future. Promotion of solar can play a catalyst role in improving the quality life of millions. This can be done by increasing awareness on the environmental and health benefits of solar energy which will mobilise solar technologies in the fuel-wood based grass-root economies. Solar can improve this situation and fulfil the third requirement of access under intergenerational equity by furthering the economies of scale and following a decentralised method. Developing solar micro-grid systems in village level for meeting the electricity requirements of a cluster of families through financial support for energy service providers, and micro-finance for consumers could lead the way for decentralised rural electrification and management. There remains a lot of scope for involving youths, village community and women into the mainstream of solar. Solar can provide an alternative source where grid system cannot work due to geographical and other reasons. The concept of solar rights implemented in many jurisdictions can be attempted in South Asia to encourage decentralisation and local ownership.

The use of solar energy does not suffer from the shortcomings in applying preservationist and opulent model developed for implementing intergenerational equity. The basic premise of preservation model relies on preserving the current resources for future generations. This is not suitable to consumer societies and is against development. By installing solar power energy we are not preserving resources without consuming them, but in fact preserving the resources for the future while continuing with our consumption requirements. This is possible as there is an ever present supply of solar energy. So the present generations need not compromise and sacrifice their developmental needs. The opulent model also can safely be applied here as maximising consumption will not have detrimental effect of future progeny. In fact, maximising and encouraging solar consumption will have the advantage of economies of scale and possible technical enhancement which will reduce the present day high cost associated with solar. Solar energy has all the ingredients to promote intergenerational equity.

The energy resources are a common concern of mankind in which all generations has an equitable claim and access. Decentralised method, access to financial assistance, and awareness of solar provides a powerful tool in assuring clean energy for all. This will prevent accumulation and utilisation of energy by only a handful in current time as well as in future. Intergenerational equity will be violated when future generations will be forced to bear a disproportionate amount of the costs of abatement or adaptation of climate change. Switching over to solar help abating climate change before it becomes irreversible. Without adopting solar energy on a large scale, we cannot fundamentally think of making any substantial mitigation to the climate change problem for the present generation and future generations. For solar to become a mechanism to promote intra as well as intergenerational equity, it is essential that legal institutions and instruments take...
concrete steps to develop and promote the use of solar and make it sustainable not merely at the national level but at regional level through cooperative mechanism based on dialogue, transparency, information sharing, technology transfer, capacity building and reciprocity.

7 Conclusions

Newspapers have reported increased typhoons in the coast of China, Philippines, and landslides and floods in different parts of India. Climate is a pressing need which will have devastating consequences not just for our generations but for the subsequent generations. In fact, the effect of climate change on future generation is expected to be of much more gravity and intensity than it is on our generation. Since one of the major source of GHG emissions come from the burning of fuel, it is imperative that any mitigating strategy to tackle climate change, addresses the possibility of shifting to renewable energy sources. Solar has great potential in South Asia and can greatly assist in promoting the principle of intergenerational equity the cardinal principle of sustainable development.

The core aspect of intergenerational equity is too broad to declare it with clarity its exact legal position. International documents and judgments have not pronounced its position as a custom or as a general principle. What can generally be gathered of the whole discussion is its general acceptance among the legal community as part of soft law. It is to be emphasised that even if we take intergenerational equity as soft law there is no denying the fact that the concept has a real impact and influence in today’s legal and future legal development as evident form its repetition in various international and national legal systems. They impose a respective political obligation when they set the framework for the exploitation or use of components of the environment including natural resources. By looking to achieve equity for future generations intergenerational equity infuses a forward looking approach into sustainable development discourse. Further, this principle act as a guiding point for policy makers before initiating and implementing development strategy.

One of the most important issues today is how to ensure that the interests of future generations are considered and incorporated in the legislative executive and judicial decisions that we make today in the context of climate change. The concept of ‘minimum standard’ and ‘Reasonableness’ can be adopted here. The concept of a minimum standard has been the foundation behind the basic human right documents. Environmental rights can easily be read into it these rights. The concept of reasonableness can also be advanced to; meaning present generation should protect, preserve and develop those resources which are considered to be reasonable from the point of a right thinking people. Examples of reasonableness and minimum standard can be even looked at negatively. We may dispute the requirement of future generations, but can be definite in our assessment that future generations will not like to inherit an atmosphere which is polluted, contaminated and toxic. Hence, the present generation is obliged to bequeath to the future generations an environment where they can survive in a dignified manner. Solar energy seems to fulfil the requirement of reasonableness and minimum standard. Drawing an analogy with environmental impact assessment (EIA), EIA has been accepted as a component of international and national jurisdiction and is mandatory requirement for projects involving environmental and social bearings. Intergenerational equity should
constitute a component of EIA, meaning the EIA process should analyse the feasibility of a project even for the consequences and impacts it has on future. This can be applicable in terms of energy policies as many of them require a mandatory EIA. To a great extent the scope of current EIA process investigate the potential future impact of a project. This will substantially increase the application of the concept. Further, some sort of institutional arrangement (commissioner, ombudsmen, etc.) will also be worth attempting as has already been initiated by some jurisdictions mentioned earlier in the paper.\textsuperscript{117}

Certain concrete steps are necessary to see that developmental goals and activities of human does not jeopardise the rights of present as well as for future generations. According to Konrad Ginther, the issue of equity developed by Brown Weiss is founded on the postulate that economic development should not take place on the environmental backs of poor communities.\textsuperscript{118} This is critical since caring for the future generation/offspring is there in the human nature, but what is to be taken care is that the same attention and concern is exercised when we act collectively as humanity.

Notes
4 Id.
6 Id.
7 Stern Review on The Economics of Climate Change Stern Report, part 11 Impact of Climate change (2007).
8 See Supra note 3.
10 See, \textit{Transfer of Property Act 1882} (India), Section 11. provides that transfer for benefit of unborn person \textquote{Where, on a transfer of property, an interest therein is created for the benefit of a person not in existence at the date of the transfer, subject to a prior interest created by the same transfer, the interest created for the benefit of such person shall not take effect, unless it extends to the whole of the remaining interest of the transferor in the property.}
11 See \textit{Indian penal Code 1885}, (India) Section 299, \textquote{Culpable homicide, Explanation 3, provides that The causing of the death of child in the mother’s womb is not homicide. But it may amount to culpable homicide to cause the death of a living child, if any part of that child has been brought forth, though the child may not have breathed or been completely born. Most of the common law countries followed the same approach.}
12 Stockholm Declaration of the Human Environment \textquote{in Report of the United Nations Conference on the Human Environment, UNEPOR, June 16, 1972, UN.Doc.A/CONF.48/14/Rev.1, 1973} (Principles 1 and 2) Declaration contains various mention of future generations Principle 1: Man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations. In this respect, policies promoting or perpetuating
apartheid, racial segregation, discrimination, colonial and other forms of oppression and foreign domination stand condemned and must be eliminated. Principle 2: The natural resources of the earth, including the air, water, land, flora and fauna and especially representative samples of natural ecosystems, must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate.

15 Id., at 499.
16 Charter of the United Nations, Preamble.
18 Id.
25 Id., Art1.
26 Id., Art 5.
27 Id., Art 5 (2).
28 Id., Art 5(3&4).
29 Water (Prevention and Control of Pollution) Act, (India), 1974, this is also the first specific and comprehensive legislation institutionalising simultaneously the regulatory agencies for controlling water pollution. The Pollution Control Board at the Centre and in the State came into being in terms of this Act.
30 Constitution of India (India) 1950, art 48-A and art 51-A (g), Directive Principle of State Policy Protection and improvement of environment and safeguarding of forests and wild life. – The State shall endeavour to protect and improve the environment and to safeguard the forests and wild life of the country. Fundamental duties – It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures. This provisions form part of Directive Principles of State Policy and Fundamental duties and hence legally not directly enforceable for individuals and groups, which takes them the immediate status of fundamental rights.
31 Subhash Kumar v. State of Bihar, (1991) AR SC 420. The Supreme Court of India ruled that ‘article 32 is designed for the enforcement of Fundamental Rights of a citizen by the Apex Court and the ‘Right to live is a Fundamental Right under Art. 21 of the Constitution and it includes the right of enjoyment of pollution free water and air for full enjoyment of life.’Virender Gaur v.State of Haryana, 1992 (2) SCC 577, 581, 7. Court held ‘Environmental, ecological, air, water, pollution, etc. should be regarded as amounting to violation of Article 21. […] it would be impossible to live with human dignity without a humane and healthy environment.’; T. Damodar Rao v. The Special Officer, Municipal Cooperation of Hyderabad,
AIR 1987 AP 171, 181, 24. Court ruled ‘The slow poisoning by the polluted atmosphere caused by environmental pollution and spoliation should also be regarded as amounting violation of Art. 21 of the Constitution.’

32 The Indian Judiciary in general have relied on various international environmental doctrines and principles including the public trust doctrine, precautionary principle, polluter pays principle, etc. Enviro-Legal Action v. UOI & Ors, AIR 1996 SC 1446., the Supreme Court of India ruled, “The Polluter Pays Principle means that absolute liability of harm to the environment extends not only to compensate the victims of pollution, but also to the cost of restoring environmental degradation. Remediation of damaged environment is part of the process of sustainable development.” M.C. Mehta v. Kamal Nath and Others, (1997) 1 SCC 388. court pronounced in categorical terms ‘The public trust doctrine, as discussed by us in this judgement is a part of the law of the land. The public trust doctrine therefore furnishes a theoretical framework to the courts in deciding those cases relating to the environment where a major community resource has been directed towards purposes and uses other than those for common enjoyment and benefit’. M.C. Mehta v. Union of India (1987) 1 SCC 395.


34 Enviro-Legal Actions v Union of India, (1996), AIR SC 1446.


36 Constitution of the Democratic Socialist Republic of Sri Lanka, (Srilanka) 1984. Ch. VI, Art. 27 The state shall protect, preserve and improve the environment for the benefit of the community. Ch. VI, Art. 28 The exercise and enjoyment of rights and freedoms is inseparable from the performance of duties and obligations, and accordingly it is the duty of every person in Sri Lanka – (d) to preserve and protect public property and to combat misuse and waste of public property; (f) to protect nature and conserve its riches., Constitution of Nepal (Nepal) 1980 Part IV, Art. 19(3) The social objective of the Panchayat System shall be to establish a harmonious social life, based upon morality, by eliminating the obstacles that may arise in the process of mobilising the general public for setting up of a society as envisaged by clause (1) and to maintain national unity with due regards to the existing mutual harmonious tolerance upon the cultural and traditional values of Nepal adhered to by the Nepalese citizen from time immemorial as the prosperity and glory of Nepal as well as their national character. These provisions are not in the form of fundamental rights hence lacking legal enforceability. Similar legal situation exists in other south Asian jurisdictions the mention of which is found later in the paper.


38 Id.

39 Id.

40 Id.

41 M. Farooque v. Bangladesh and Others (1997) 49 DLR (AD) 1 Court took the assistance of Art 31 and art 32 of the Constitution of Bangladesh. Article 31 states that every citizen has the right to protection from ‘action detrimental to the life liberty, body, reputation, or property’, unless these are taken in accordance with law. Article 32 states: “No person shall be deprived of life or personal liberty save in accordance with law”. These two articles together incorporate the fundamental “right to life and that this right to life includes the right to a healthy environment capable of supporting the growth of a meaningful ‘existence of life.”

42 Id.

43 Id.


Island of Palmas Arbitration, (Netherlands United States) (Award) (1928) 2 RIAA, 829, 846 Award noted ‘As regards the question which of different legal systems prevailing at successive periods is to be applied in a particular case (the so-called intertemporal law), a distinction must be made between the creation of rights and the existence of rights. The same
principle which subjects the act creative of a right to the law in force at the time the right arises, demands that the existence of the right, in other words its continued manifestation, shall follow the conditions required by the evolution of law.


74 Id., at 301.


76 Id.

77 Id.

78 Id.


80 Noor, S. and Siddiqi, M.W. (2010) ‘Energy consumption and economic growth in South Asian countries: a co-integrated panel analysis’, International Journal of Human and Social Sciences, pp.5–14. Pakistan’s energy crisis seems to be worsening, with overall demand expected to top 50,000 megawatts (mW) by 2030 – which is three times the supply currently provided by its system. Nepal experiences up to 20 hours of power cuts per day during the dry season, while over 50% of Bangladesh’s population still have no access to electricity, Collective Action’ Needed to Target South Asia’s Energy Crisis [online] http://www.apolloenergy.co.uk/collective-action-needed-to-target-south-asias-energy-crisis/ (accessed 21 September 2012).

81 Id.


84 Id.


87 Id.

88 See Supra note 82.

89 Id., at 43.


92 Id., at 43.


94 Id.

95 Id., In Bangladesh The total potential is estimated at 700–900 × 10 18 J/year. For Nepal With about 300 days of sunshine per year in most parts of the country and an average of eight light hours per day, the country has the potential of generating 3–4 kWh/m 2 per day from solar energy.
101 Id.
102 See Supra note 82.
103 Id.
105 Sri Lanka has the world’s most successful rural solar programme. More than 100,000 homes use solar today, this is 2% of all homes in Sri Lanka which is around 5 Million, Senanayake, G. (2009) Sri Lanka Renewable Energy Report, Asian and Pacific Centre for Transfer of Technology of the United Nations – Economic and Social Commission for Asia and the Pacific (ESCAP).
106 Id.
107 Id, at 41.
110 Sankar, T.L., Raza, H.A., Barkat, A., Wijayatunga, P. Acharya, M. and Raina, D.N. (2006) ‘Regional energy security for South Asia’, (Regional Report, 2006) [online] http://pdf.usaid.gov/pdf_docs/PNADS866.pdf. None of the countries in South Asia region has been able to supply electricity to all the households in the country. A large number of villages are yet to be electrified through power grid interconnections In Bangladesh, only 32% of the population has access to electricity, In Afghanistan only 6% of the population has access to electricity. Only 40% of the total population and 30% of the rural population in Bhutan has access to electricity. Ninety percent of Pakistan’s population either does not have access to electricity or consumes less than 60 kW/hrs a month per household and their quality of life is correspondingly low.
111 See Supra note 109.
113 ‘Floods, landslides lash North India’, The Hindu, Delhi, India 7 August 2012, p.3., ‘China Typhoon Saola Death toll Rises to 44 as storms hit China,’ The Hindu, Delhi, India, 3 August 2012, p.5.
117 The proposal for appointing ombudsmen was initially suggested by Malta when the delegates submitted their suggestion for a Guardian for Future Generations during the United National Conference on Environment and Development 1992. Preparatory Committee for the United
Application of solar energy in South Asia
