



**Radboud  
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**Energy Justice: How the Asian Development Bank (ADB) promotes  
energy justice transition in India. Case study of Charanka solar  
power park in Gujarat state**



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*Dedicated to my Father – Rahim Mardamov, for empowering me to accept challenges, not to be afraid of failures, and stay hungry for knowledge!*

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## LIST OF ABBREVIATION

Abbreviation	Full Form	Abbreviation	Full Form
AP	Affected People	MW	Megawatt
ADB	Asian Development Bank	MNR	Ministry New and Renewable Energy
CRP	Compliance Review Panel	MNC	Ministry Non-Conventional Energy Sources
CPS	Country Partnership Strategy	ES	
DMC	Developing Member Country	MDB	Multilateral Development Banks
EA	Electricity Act	NAPC	National Action Plan on Climate Change
EJ	Energy Justice	C	
ESIA	Environmental and Social Impacts Assessment	NME	National Mission for Enhanced Energy Efficiency
EIA	Environmental Impact Assessment	EE	
EMP	Environmental Management Plan (EMP)	NGO	Non-government Organization
EMoP	Environmental Monitoring Plan (EMoP)	PV	Photovoltaic
FIRR	Financial Internal Rate Return	PIU	Project Implementation Unit
GAP	Gender Action Plan	PMU	Project Management Unit
GW	Giga Watt	PCP	Public Communication Policy
GoG	Government of Gujarat	PPP	Public-Private Partnership
GoI	Government of India	RE	Renewable Energy
GHG	Green House Gas	R&D	Research & Development
GRC	Grievance Redress Committee	R&R	Resettlement & Rehabilitation
GRM	Grievance Redress Mechanism	RP	Resettlement Plan
GERC	Gujarat Electricity Regulatory Commission	SPS	Safeguard Policy Statement
GETC	Gujarat Energy Transmission Corporation Limited	SIA	Social Impact Assessment
O		STT	Social Technical Transitions
GPCL	Gujarat Power Corporation Limited	SPVS	Solar Photovoltaic System
Rs	Indian Rupees (Rs.)	SPP	Solar Power Policy
IP	Indigenous Peoples	SDG	Sustainable Development Goals
IEE	Initial Environmental Examination	USD	U.S Dollar
IEP	Integrated Energy Policy	UN	United Nations
IDA	International Developing Agency	UNFC	United Nations Framework Convention Climate Change
ISA	International Solar Alliance	CC	
IR	Involuntary Resettlement	WB	World Bank
JNNSM	Jawaharlal Nehru National Solar Mission		
KW	Kilowatt		
LA	Land Acquisition		
MP	Master Plan		

## **ABSTRACT**

The development of the renewable energy is growing at the accelerated speed in the developing nations. This development raises the “human dimension” concerns within the energy justice framework. The energy justice concept, which is relatively new in the academia, has been applied in this research to assess to what extent the International Development Agency promotes a just energy transition in the Charanka solar power park in India, which was taken as a case study. The research outlines and examines some key policies and regulations used in the power park through the nine principles of the energy justice conceptual framework. Interviews with relevant stakeholders have been conducted to support the case study and policy analysis.

The results of the research presented the importance of good governance in the developing nations, where the lack of the public participation in the process led to procedural injustice. The human dimension is a significant part of the energy justice concept. In this case, both developing nations and international developing agencies should promote accountability through empowering civil society organizations. The recommendations are followed for the policy-makers and policy implementers for the developing nations and international developing agencies. The areas for the future research are outlined.

**Key Words:** Charanka solar power park, energy justice, procedural justice, renewable (solar) energy policies, ADB project.

*“No power is as expensive as no power”  
Dr. Bhabha, India’s nuclear energy expert.*

## **Chapter 1. Introduction**

India, a developing nation with the world’s second biggest population, has its own interest to transit into the sustainable energy system. For a few decades, India has been eager to gain its energy independence to further foster its economic growth (Bhatia & Banerjee, 2011). The country still has poor living standards with low electricity access. Thus, India with its high pace developing economy has been struggling to meet its growing energy demands for its industries and residents.

However, ever since the Jawaharlal Nehru National Solar Mission (JNNSM) program has been launched in 2009, India started targeting constructions of the world’s biggest and ambitious solar projects with confidence (MNRE, 2016). With its construction, India aims at fighting poverty, improving living conditions through the equal electricity access, achieving energy-independence, and maintaining sustainable clean energy to its remote villages. The decision to shift from the traditional energy (fossil fuel) into the renewable energy is widely seen as a significant contribution of India towards combating world climate change.

The facilitation of the international developing agencies, e.g. UN, World Bank and ADB, in India’s energy transition process is vital. Examples are the UN’s Sustainable Development Goals (SDGs) by 2030 and ADB’s Country Partnership Strategy (CPS) 2018-2022. Particularly, the 7, 11 and 13 SDGs target development of the infrastructure, boosting and promoting technology for clean energy in the developing countries as a universal right (UNDP, 2018). The overarching mission of international developing agencies is to improve the quality of life by increasing awareness of social aspects of energy policies, equity, and fairness. More widely, questions have been asked about the justice dimensions of present and future energy systems.

The ‘energy justice’ concept embraces the equitable distribution of both benefits and burdens of the production and consumption of energy services, including how people and communities are treated fairly in energy decision-making processes (Sovacool and Dworkin, 2014). The concept gives all the right to access energy services, independent of the economic development of any government. It incorporates

how adverse environmental and social impacts associated with energy are disseminated over space and time, including human rights violations and the access that vulnerable and disenfranchised communities do or should have to remedies. Energy Justice (EJ) is concerned with guaranteeing that energy development and siting do not violate basic civil liberties and that communities are consciously informed and taken into an account in energy decisions (Sovacool & Dworkin, 2014). There are important questions about the extent to which EJ adds value to both substantive and decisional procedures. Besides examining Indian EJ transition, this paper also assesses the value of EJ in practice.

India was the first ADB country-member to loan money in 1986 and since then the ADB has been facilitating many reforms in the country. The recent ADB's CPS 2018-2022 facilitates three strategies: 1) promoting economic competitiveness to establish more and better jobs; 2) maintaining inclusive access to infrastructure networks and services; and 3) focusing on climate change and rising climate resilience (ADB, 2018).

This research took the Charanka solar park project, funded by the ADB, in Gujarat state as a case study to assess how the EJ framework has been applied. India is a great example of the growing economy with the huge population, where the questions of justice need to be addressed. The aims and objectives of the research are followed along with the research questions.

### **1.1. Research Aims and Questions**

The aim of this thesis is to assess the extent to which international development agencies are promoting a just energy transition. This aim is pursued through an analysis of Asian Development Bank actions and policies for solar farms in India.

#### **Research Questions:**

1. How does the ADB represent its objectives for solar energy development in India?
2. To what extent are these representations sensitive to dimensions of energy justice?
3. To what extent are the ADB's actual strategies and programmes for Solar energy likely to be consistent with these dimensions of EJ in practice?

4. To what extent is there resistance from public in India towards these solar energy policies and programmes, and how justice concerns are raised?

## **1.2. Social and Scientific Relevance**

This research adds value in understanding the reasons and challenges behind the energy transitions in India by applying energy justice insights and applications. From the academic view, the energy justice is a relatively new concept and has been little studied in the developing nations.

The assessment of how the international development agencies facilitate energy justice has both social and scientific relevance considering the limited research available on this topic. In this context, the importance of the ADB's policy assessment on solar energy projects and the influence of those policies towards the energy justice transition in India is significant. This paper covers the gap in the research literature on energy justice transition in the developing nations, the practical application and assessment of the energy justice concept; whereas there are only a few literary sources available on the empirical study applying the energy justice framework into practice.

## **1.3. The Structure of the Paper**

The research begins with the literature review investigating the concepts of sustainable energy transition, key institutions, and stakeholders, the energy justice concept including its core pillars and its practical application. The methodology chapter, how this research is implemented, is followed once the energy justice factors are identified in the literature review chapter. The used methods include:

- the comprehensive policy analysis of the Indian solar energy programs;
- the ADB's safeguards and policies on the renewable energy;
- Charanka solar park as the case study;
- interviews with independent experts and ADB representative.

The policy chapter includes both ADB and Indian policies on renewable energy. The Indian policy subchapter provides a brief outline of the relevant policies including JNNSM.

One of the key chapters, case study, covers outcome of the qualitative policy analysis and semi-structured interviews with experts based on the research aims. The relevant recommendations, along with the research limitations conclude the chapter. The last chapter also outlines the comprehensive overview of the theoretical concept and findings from relevant policies and interviews.

## **Chapter 2. Literature Review**

This chapter provides literature review on the sustainable energy transition, particularly the politico-economic aspect of it, the role of government bodies, and the energy justice concept. The theoretical concept of the energy justice is linked with the research questions. The first subchapter represents the institutional structure of the energy transition system and its key players. The following subchapter focuses on defining the energy justice concept with its three tenets. Not only this chapter reviews key elements of the literature review on the energy justice concept, but also addresses critically the application of the theory in practice.

The chapter is concluded with the developed energy justice conceptual framework, which serves as an evaluation tool to assess existing ADB and Indian policies and regulations on the renewable (solar) energy projects.

### **2.1. The Political-Economy of Energy Transition**

This subchapter helps to better understand how changes and innovations take place, how key stakeholders support those changes in energy transition. As a part of the Paris climate agreement, a number of nations showed their commitment to reach the greenhouse gas (GHG) emission targets by shifting from the centralized, fossil fuel energy system into the sustainable energy transformation. The new policies encourage the use of clean technologies, are enabled to decrease carbon energy output and its demand in many industries e.g. energy, transport, etc (Kuzemko, et al, 2016; Geels, 2010, Elzen et al., 2004; Wiskerke and Van der Ploeg, 2004).

Those changes in a system are called 'socio-technical', trigger the use of new technologies and shifts in markets, policies and cultural values (Geels, 2004). According to the theory of the Social-Technical Transitions (STT), the energy systems consist of multiple and interconnected disciplines; the role of a good governance is

pivotal in acknowledging the value of the innovation for the sustainable energy shift. Figure 2.1.1. outlines the interdependence within processes of governing for sustainable energy transitions, reflecting on how the compound energy systems function and change, starting from sociological institutionalist theories into political institutions, policymaking, civil society activities, corporate groups, and the environment (Kuzemko, et al, 2016; Foxon, 2011; Rotmans et al., 2001).

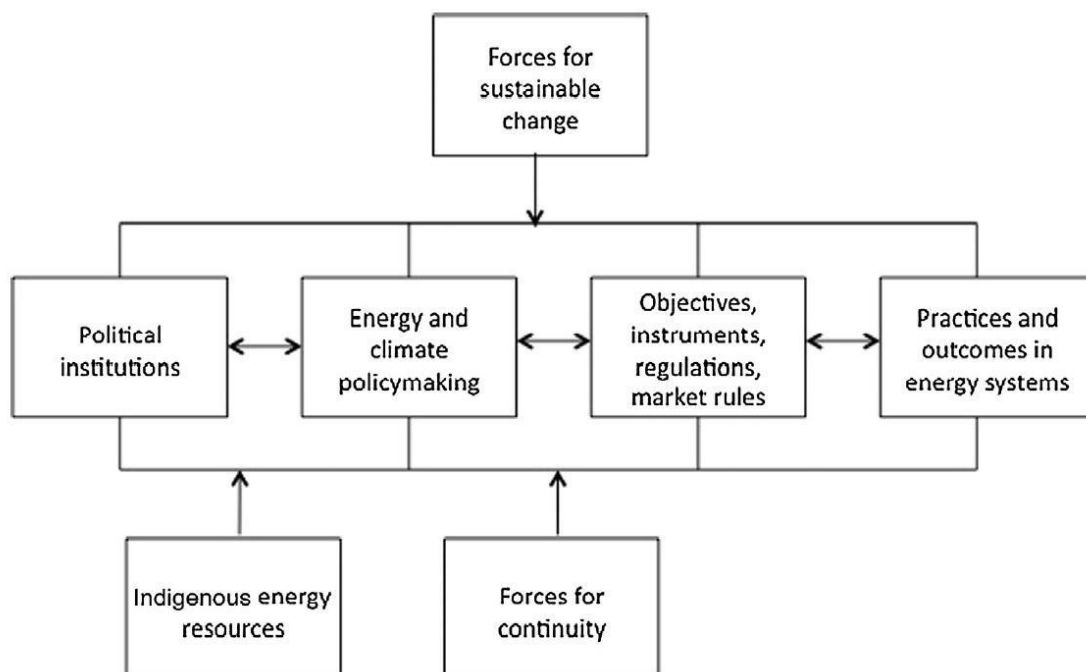


Fig.2.1.1. Interconnections within processes of governing for sustainable energy transitions. (Source: Kuzemko, et al., 2016).

As a concept, STT is a massive transformation in society, where the framework of the socio-technical system essentially shifts. Those transformations and changes take time before new technologies and services emerge, thus, the roles of the civil society, sustainable industries and government to push climate change agendas are important for lowering the CO<sub>2</sub> emission and promoting sustainable energy innovations. In the transition process some actors benefit while others lose; according to Meadowcroft, conflict associated with the technological development and economic competitors argue the direction of development and opposition forthcoming from the actors who bear the costs of transformation, such as environmental harms and risks, lost jobs, etc (2005, p. 488).

Until now sustainability scholars have emphasized mostly on policy: what it is and what it could/ should be (Meadowcroft, 2011). To criticize political leaders for ill-judged decisions and their failure to embrace sustainability is easy since change in

the societal development is a long, disorganized and difficult path. Temporary focus on general agreements, e.g. electoral cycles, voter attention span, planning horizons, are frequently criticized. Figure 2.1.2. illustrates the energy system with its stakeholders, their relationships, and interconnectedness.

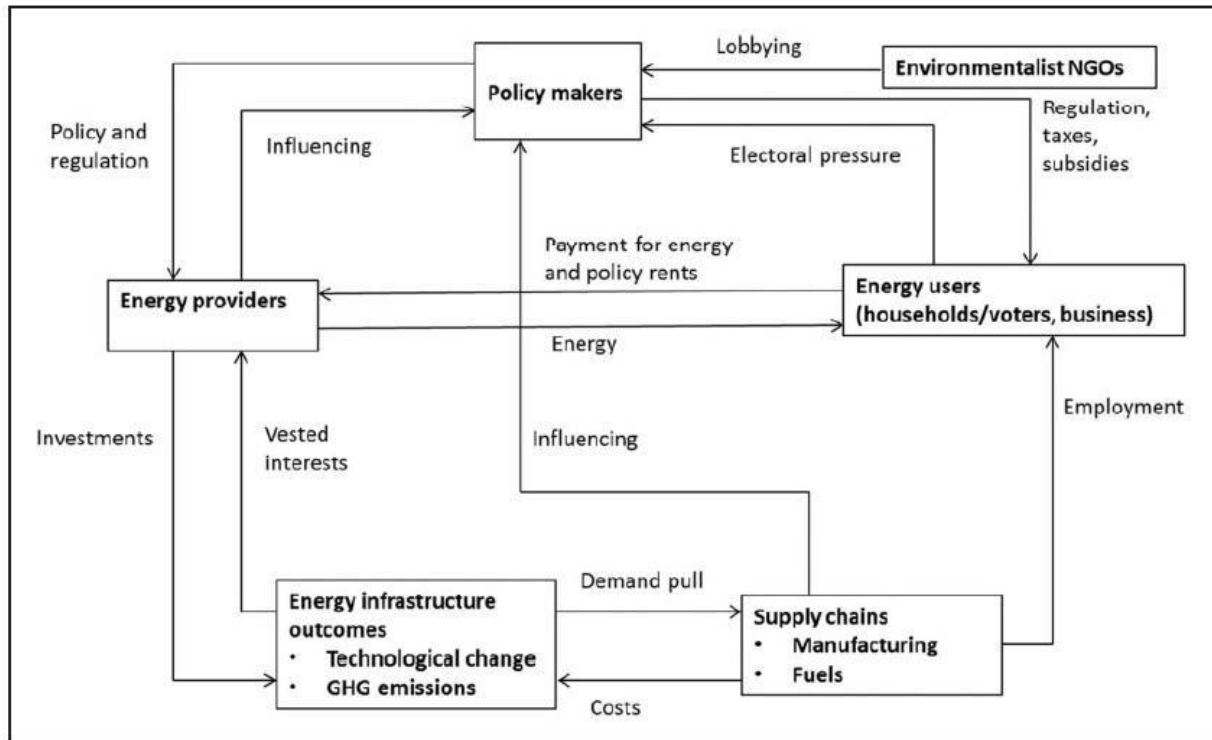


Fig.2.1.2. Actors and relationships in the energy system. (Source: Lockwood et al., 2017).

There are two approaches, top-down governance and bottom-up, to STT and innovations. The first approach reinforces the role of the government in directing and connecting technical innovations with urgent socio-political programs, where state intervention and governance reform are essential for the sustainable transition. The example of it in Figure 2.1.2 shows where policymakers impact on the energy users in the form of regulations, taxes, and subsidies while the latter puts electoral pressure on the policymakers (Lockwood et al., 2017).

On the other hand, any government is dependent on funds coming from dominant economic operations, here political and economic players are intertwined between energy users and energy providers. Certain government projects can promote or discourage innovation. Transforming energy systems frequently encompasses supplementary up-front financial charges for energy consumers or taxpayers, such transformation can be hard for chosen politicians. As a part of bottom-up approach, if investors dread that cost or further issues may in the future bring to the postponement



or reverse of support policies, investors may restrain from investing into new infrastructure (Lockwood et al., 2017; Forman, 2017).

For the last decades, the number of sustainable energy innovations and its lobbying increased due to the strong influence of Environmentalist Non-Governmental Organizations (NGOs) and supranational organizations<sup>2</sup>. The integration of both bottom up and top down approaches are necessary for sustainable energy shift, where a government can cultivate numerous innovations, and motivate their increase (Stirling, 2014). The next subchapter talks about the theoretical definition of the EJ concept.

## **2.2. Energy Justice Concept**

The EJ concept has a long history of use unlike its academic background, where energy is a new focus for justice academics (Jenkins et al., 2016b; Heffron and McCauley, 2017). The energy transition raises many issues about justice and fairness through sustainable energy transition. The theoretical literature on transitions is relatively silent on justice issues. Such justice issues become especially important when considering how energy transition plays out in developing countries, particularly when limited resources and population growth create unstable social and environmental circumstances. To comprehend such phenomena, a number of conceptual frameworks including energy justice have emerged.

Scholars like Jenkins, Sovacool, Dworkin, etc., have already made a significant academic contribution. The foundation of the energy justice is coming from the environmental justice concept. This concept originated from the environmental justice movement that emphasized on equal dissemination both of environmental assets and ills, established in the USA in the early 1980s. The environmental justice stands for equal treatment, public participation in the development, and application of environmental laws, policies and promoting alternatives to decrease GHG emissions (Mickelson, 2007; Schlosberg, 2013; Temper et al., 2015).

Alike the environmental justice the energy justice applies justice doctrines to energy policy including energy production, consumption, security and climate change (Jenkins, et al., 2016b; Sovacool and Dworkin, 2015). The concept of the energy justice

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<sup>2</sup>An organization that exists in multiple countries, often describes an international government or quasi-government organization. E.g. UN, IMF, etc.

covers equal distribution of advantages and disadvantages of the energy services. Jenkins outlines the core energy justice issues:

- How communities, often the poor and disenfranchised, unequally exposed to expenses and hazards of the energy structure;
- How advantages and access to modern energy structure and services are greatly unequal;
- How energy procedures and projects are realized based on the privileged decision-making format lacking due process and public representation.

According to Sovacool and Dworkin, the energy justice concept should assure that energy policies are executed fairly with equal public participation in the decision-making process. Authors proceeded further stating that the concept attributes to the happiness, prosperity freedom, fairness, and due process of producers and consumers once those core issues are followed (2014, p.5).

The energy justice concept has three key tenets: distributional, recognition and procedural. Those tenets assess a) where injustices happen, b) who has been ignored, c) what procedures are available to their remedy in favor of (i) exposing, and (ii) decreasing those injustices (Jenkins et al., 2016b). Table 2.2.1 illustrates evaluative and normative inputs of energy justice.

Tenets	Evaluative	Normative
Distributional	Where are the injustices?	How should we solve them?
Recognition	Who is ignored?	How should we recognize?
Procedural	Is there fair process?	Which new processes?

Table 2.2.1. The evaluative and normative contributions of energy justice.  
(Source: Jenkins, et al., 2016).

Distributional justice covers and scrutinizes where energy injustices emerge. The location of production factories, for example, fracking gas stations in the Netherlands has brought justice concerns by neighboring communities (Rasch and Köhne, 2017). Recognition-based justice focuses on layers of society that are ignored or misrepresented. The examples include ethnic minorities, indigenous peoples, and vulnerable populations that have been exposed to an unequal location next to the power factories where their concerns have not been considered during the decision-

making process and led to recognition-based justice through non-recognition and disrespect (Jenkins, et al., 2016).

Procedural justice investigates the ways in which decision-makers attempted to involve and engage neighboring communities in the project process. For example, public acceptance could be established through a sense of community ownership in wind farms (Forman, 2017; Cowell, et al., 2011; Warren and McFadyen, 2010). Procedural justice could be achieved through local knowledge arrangement, increasing transparency and accountability by making information available to the public, and better institutional representation (Jenkins, et al., 2016).

Yenneti applied these three tenets in her empirical study as an assessment tool while conducting questionnaires and interviews with the local citizens, project developers and authorities (Yenneti & Day, 2015; 2016);

On the other hand, this research investigates and assesses the energy justice concept from a different angle, the impact of the ADB on Indian energy justice transition, which is on the supranational scale. The primary data was collected by conducting semi-structured interviews with the representatives of ADB and ADB watchdog NGOs, business developers, and independent (academic) energy experts and consultants. The current research analysis and assessment were based on the nine principles of energy justice, the third phase in Table 2.3.1 (Sovacool et al., 2017).

The pioneers of the energy justice concept, Sovacool and Dworkin, have designed the energy justice decision-making tool for the policymakers to assess energy projects and policies (2015, p. 440). However, the criticism of it is that authors failed to provide an explanation of how to assess the theoretical concept in practice as the designed assessment tools are general and abstract to apply. The ideas are broad and complex lack simplicity to apply. The challenge, after examining relevant literature, remains - how to deploy and assess the concept in empirical cases (Cowell, 2016; Sovacool and Dworkin, 2015).

Based on the primary works of Jenkins, Sovacool, Dworkin, etc., Heffron and McCauley (2017) assembled and established the energy justice conceptual framework from theory to practice in Fig 2.2.1, consisting of 3 phases. The first phase is well explained in Table 2.2.1. in the works of Jenkins, et al. (2016). The second part includes the energy life cycle starting from energy extraction to its waste. The third phase was developed in a close partnership of Sovacool, Burke, Baker, Kotikalapudi, and Wlokas, based on the 10 EJ principles (2017). The main limitation of the energy

justice conceptual framework is its little contemplation of how those theories of energy justice are implemented in practice through the policy (Heffron and McCauley, 2017).

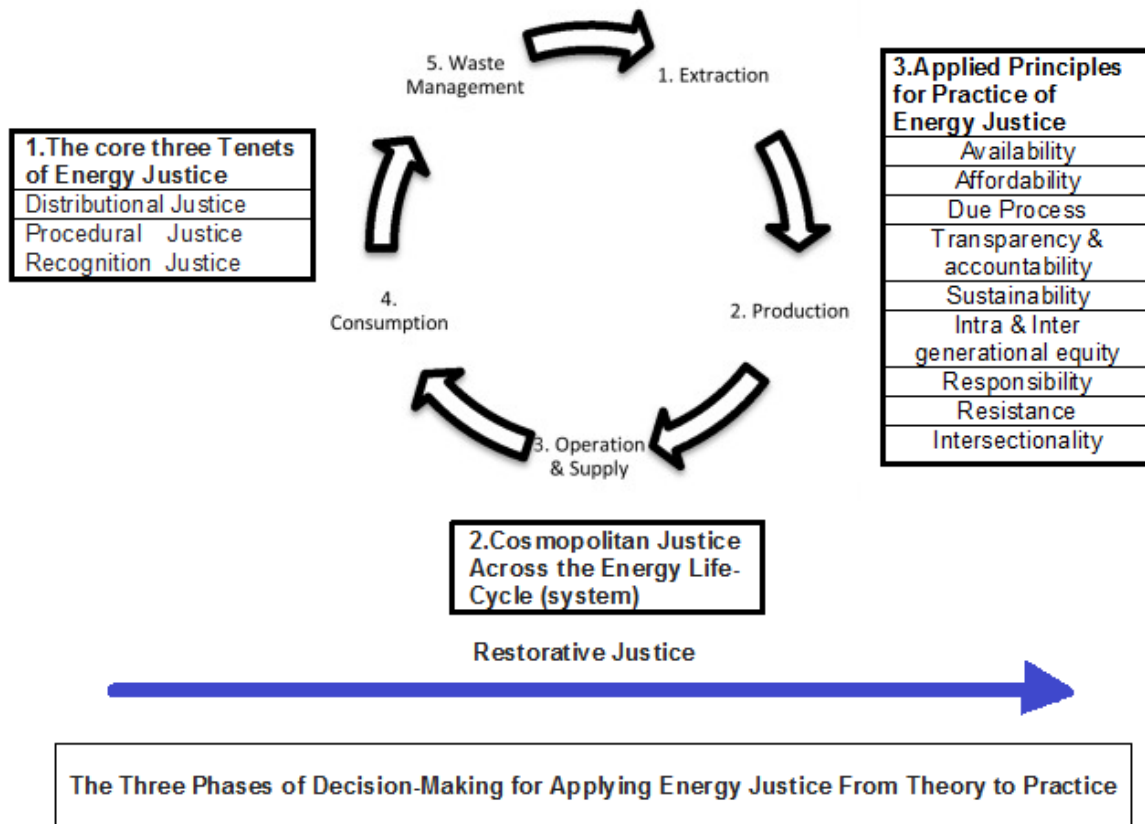


Fig 2.2.1. The energy justice conceptual framework from theory to practice.  
 (Source: Heffron& McCauley, 2017).

To give a more comprehensive idea on how the EJ doctrine evolved, Heffron and McCauley (2017) added another dimension to the concept by concluding it with the restorative justice on Figure 2.2.1. The restorative justice deals with measures addressing the victim/s once the injustice took place. It is widely practiced in the criminal justice system, emphasizing on the recovering of lawbreakers by settling with victims and the community. Thus, the restorative justice plans on restoring the damage made to people, society, and nature instead of only punishing the lawbreaker. This way it triggers society to contemplate on how to react to the harms and injustice that took place. When applying the restorative justice in energy justice decision-making, the policymakers should consider the issue at the wider scope to stop and fix any injustice induced by energy activity (Heffron and McCauley, 2017). This paper does not test the restorative justice approach as no lawbreaking notices have been mentioned in the project documents or social media.

## 2.3. Conclusion

After examining the main literature on the EJ, the conceptual framework was designed as an assessment tool to meet the research aims. Sovacool et al (2017, p. 687) restructured the EJ concept by inputting some changes as replacing good governance with transparency and accountability, adding two new aspects: resistance and intersectionality, as shown in table 2.3.1. The newly added resistance principle addresses the research question 4, particularly public acceptance and resistance in the chain of command during the project implementation. During the application of the EJ concept in the case study chapter, it was observed that both availability and affordability principles are embraced in the intragenerational equity principle. Therefore, the EJ concept was downsized from 10 principles to nine.

The principles apply the social justice in the global energy system by including both advantages and disadvantages. The advantages include access to the modernized energy systems and its maintenance that are distributed across the society. The disadvantages include how the jeopardies and expenses of the energy system are distributed across society, to make sure that energy decision-making considers due process and representation, and recognition that poor or vulnerable layers of society have inclusiveness to those advantages (Jenkins et al., 2016a). Sovacool and Dworkin (2015) consolidated all core EJ principles (distributive, procedural, cosmopolitan, and recognition justice) under one table targeting “justice-aware” energy planning and policymaking to protect the rights of vulnerable layers of a population (Sovacool et al., 2017).

No	Principle	Description
i	<b>Availability</b>	People deserve sufficient energy resources of high quality (suitable to meet their end uses)
ii	<b>Affordability</b>	All people, including the poor, should pay no more than 10% of their income for energy services
iii	<b>Due Process</b>	Countries should respect due process and human rights in their production and use of energy
iv	<b>Transparency and accountability</b>	All people should have access to high-quality information about energy and the environment and fair, transparent, and accountable forms of energy decision-making

v	<b>Sustainability</b>	Energy resources should be depleted with consideration for savings, community development, and precaution
vi	<b>Intergenerational equity</b>	Future generations have a right to enjoy a good life undisturbed by the damage our energy systems inflict on the world today
vii	<b>Responsibility</b>	All actors have a responsibility to protect the natural environment and minimize energy-related environmental threats
viii	<b>Resistance</b>	Energy injustices must be actively and deliberately opposed
ix	<b>Intersectionality</b>	Expanding the idea of recognitional justice to encapsulate new and evolving identities in modern societies, as well as acknowledging how the realization of energy justice is linked to other forms of justice e.g. socio-economic, political and environmental

Table 2.3.1. The conceptual framework of energy justice. (Source: Sovacool et al., 2017).

The EJ conceptual framework is harder to apply in empirical cases because there are some concerns regarding its interpretation:

- i) it is tricky to implement those principles or judge how they have been implemented as most of the principles are defined broadly and general;
- ii) in practice, the different principles may conflict or at least, there may be trade-offs; e.g. some of the principles' definitions are overlapped and repeated, not adding value.
- iii) how organizations treat principles, as empty symbols? or public relations? The language of the principles should assure that criteria is being addressed at the higher quality standards and systematically, rather than being checklist.
- iv) there is always a gap and disorder between principles and how they have been implemented, e.g. heterogeneous situations 'on the ground'. E.g. the ADB or Government of India (GoI) have a well-designed policy and regulation, however, it has not been practiced as it was intended in the policy. The EJ concepts should serve as a measuring tool to trace transparency and policy implementation through clear language on how

to address who is responsible, and how to monitor its implementation (Cowell, 2016).

The conceptual framework in table 2.3.1. is used for the analysis of the Indian and ADB's policies on the renewable (solar) energy, and case study to meet the research objectives. In the final chapter, the author provides the reflection on the encountered challenges in the case study while applying EJ conceptual framework. The next chapter focuses on how the research is undertaken, what methods and approaches were used.

### Chapter 3. Methodology

The methodology chapter provides an interpretation for each selected research approach, along with its justifications, research restrictions including consideration of required ethical matters. Methodology discusses the applied ways for data collection and developed techniques for its analysis. Figure 3. displays key elements of this research framework, consisting of two key parts: i) the research design for this thesis and its limitations; ii) the collected data, and the methods applied for analysis.

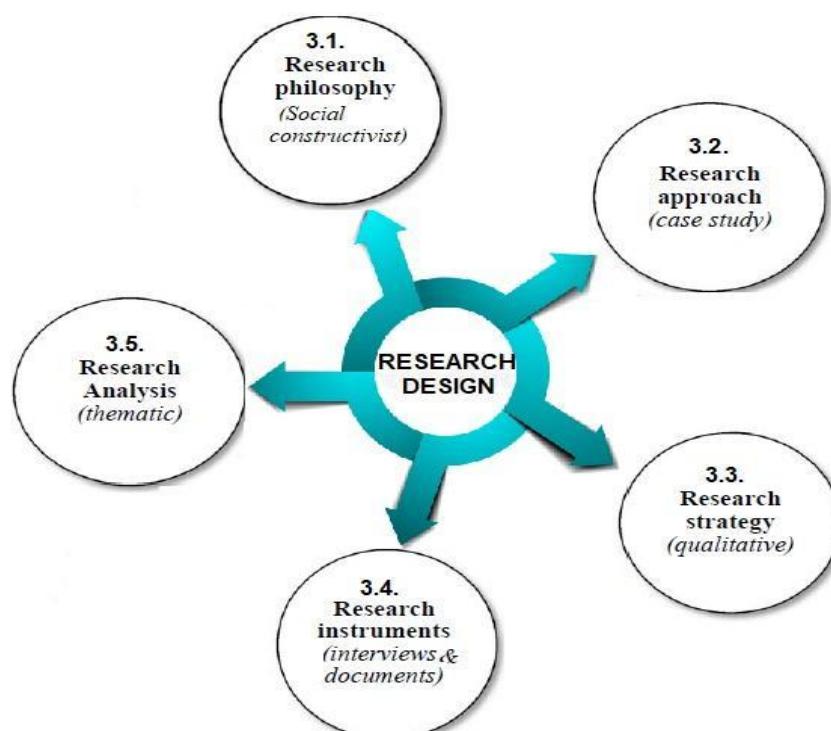


Figure 3. The key elements of research framework. (Source: Author).

### 3.1. Research Philosophy

The qualitative research determines how to study the social world by defining beings who construct worlds of meaning and follow the world rather than allowing the world to act upon them. Qualitative research explores to see and comprehend the world from the aspect of the people being studied (Morrison et. al., 2011, p.38).

A research philosophy assists with research method in which data about a phenomenon should be assembled, analyzed and applied. The beliefs about the nature of the social world and what can be known about it, e.g. the examination of what is meant by 'being', called –ontology. The nature of knowledge and how it can be acquired, e.g. 'what is known to be true', is called – epistemology (Ritchie, et. al., 2013, p.14). Thus, ontological and epistemological philosophies show “how research should be arranged” (Sarantakos, 2005). The epistemological philosophy has two paradigms: interpretivism and positivism; the paradigms about nature and knowledge that dominated in human geography research. The positivists debate that only knowledge obtained by scientific observation of facts can explain theoretical generalizations. The interpretivists are concerned with understanding the world based on subjective experiences of individuals, such as individual behaviors, perceptions, emotions, and beliefs (May 2001, p.11-20). The Social constructivism, which is a part of ontology, outlines 'multiple constructed realities' in the shared investigation (by researchers and participants) of meanings and explanations (Ritchie, et. al., 2013, p.12). The disadvantage and advantages of this approach are that it is less structured and more flexible; a qualitative research strategy delivers thorough insights, discussions, impressions and shared meaning of interviewees' daily realities and their social worlds (Limb & Dwyer, 2001). As it reveals meanings, definitions, characteristics, and descriptions of justice prospects in the solar power park project realization. Therefore, this research applies and connects interpretivist epistemology with the ontology's social constructivist approach.

Deductive reasoning is based on the logic, while inductive reasoning is based on general principles from specific observations. The research applies both deductive and inductive approaches. By using an inductive case study, the research interprets the interviewees' insight on how the project is implemented, compares and finds discrepancies on how it is stated to be implemented in official documents, whereas



deductive approach is used when findings are analyzed based on the pre-established EJ conceptual framework (subchapter 2.3, table 2.3.1.).

### **3.2. Research Approach**

Case study approach, as part of the qualitative method, allows a researcher to explore the data in a specific context. According to Moore, case studies are applied when there is a need to design a thorough comprehension of what is happening in complex situations (2000, p. 134). Thus, it investigates “how” and “why” questions regarding contemporary situations, particularly when contextual implications may affect the phenomena in question (Yin, 2014, p.16). What separates a case study from other research methods is the researcher’s concern with the unique components of a case (Bryman, 2016, p.61). The case study methods are occasionally criticized for lack of methodological accuracy and failure for generalization (Yin, 2014, p. 20); if the same results may be employed in such projects that share similar components (Stake, 1980, p.127). On the other hand, Mitchell argues that case studies are a reliable approach in the social analysis of any design. “Much criticism of their reliability and validity has been based on a misconception of the basis upon which the analyst may justifiably extrapolate from an individual case study to the social process in general” (Mitchell, 1985, p. 183). However, the misconception could be avoided if causal mechanisms abstracted, with care, of wider validity from analysis of what is happening in a single case. Thus, the proposed research lessened possible weaknesses by restricting implications of findings on the applied nine principles of EJ theoretical propositions.

#### **3.2.1. The Case Study Selection**

The flexibility of qualitative research is its biggest advantage; qualitative researchers are free to select and choose from different research techniques, which are subject to the research question and the research setting (Morrison et. al., 2011, p.24).

The selected case study possesses qualities that exemplify the issue that the research is addressing: i) a recent (mega) solar energy development project; ii) geographical location needs to be in the developing country; iii) financed by the International Developing Agency (IDA), the ADB; and iv) online availability and access to primary and secondary documents in English. The research investigates the social justice in a

large-scale solar energy developing park, a case study, and the role of the IDA in designing and developing projects of such scale in accordance with the energy justice concept. The choice of the case study was vital to widely reflect the main components of similar projects allowing to generalize the findings for similar projects (Moore, 2000, p.34). The selected case of Charanka solar power park project in Gujarat State of India meets the required criteria and provides in-depth study based on the available official project documentation in English. The case is interesting because of its geographical location (in the border with Pakistan), the project scope (mega project), and the populations' social-economical setup. The project area of 2500 hectares (ha) is in Patan district. The allocated land was mainly used for grazing and farming by the local population where the social stratification system enabled.

### 3.3. Research Strategy

To better answer the research questions the mixed research methods are applied as presented in Table 3.1.1. The research strategy combines different methods, in the same study, to partially overcome the deficiencies resulted from applying one single research or one method (Nachmias, 2007, p. 12). The triangulation method endorses validation of data across two or more sources in the study of the same phenomenon. The triangulating allows to better comprehend the energy policy implementation from the ADB, GoI, NGO sides through the EJ assessment-principle in table 2.3.1.

The data type is qualitative, which is primarily exploratory research. The qualitative research is applied to acquire an understanding of primary reasons, opinions, and motivations.

Research question	Method	Data Type
1. How does the ADB represent its objectives for solar energy development in India?	Documentary Analysis and semi-structured interviews	Qualitative
2. To what extent are these representations sensitive to dimensions of energy justice?	Documentary Analysis and semi-structured interviews	Qualitative
3. To what extent are the ADB's actual strategies and programmes for solar energy likely to be consistent with these dimensions of energy justice in practice?	Documentary Analysis, Case Study, semi-structured interviews	Qualitative

4. To what extent is there resistance from public in India towards these solar energy policies and programmes, and how justice concerns are raised?	(Media) Documentary Analysis, semi- structured interviews	Qualitative
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Table 3.1.1. Summary of Research Strategy. (Source: Author)

### 3.4. Research Instruments

The data consolidation was based on the existing literature, policy and media analysis, secondary data, and semi-structured interviews that were involved in the case study of Charanka solar power park project in Gujarat state (Figure 3.1.1.).

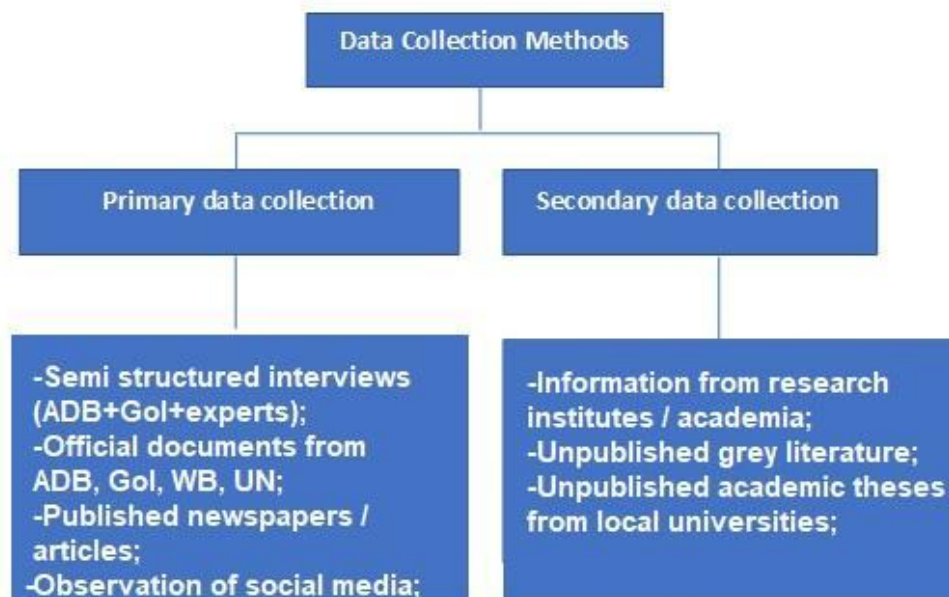


Figure 3.1.1. Applied research instruments for data collection. (Source: Author).

#### 3.4.1. Semi-structured Interviews

To get a versatile in-depth understanding of how the social and energy justice concerns are addressed in the case study, relevant interviews were carried out with the representatives of the ADB, the Gol, ADB watchdog NGO, Indian solar energy consultancy, and experts from academia and business. Selected interviewees were chosen based on the interviewees' expertise to i) the research case study location (Charanka, Gujarat); and ii) the research subject. The research subject included both solar energy policies and its implementation, and aspects of social and energy justice.

According to Nachmias, the number of interviewees is nearly insignificant as it is the depth of the information that is essential, not the scope (2007, p. 231). The list of interviewees is presented in Appendix III. The versatility of interviewees, primarily, assured voicing the EJ concerns from the main stakeholders such as ADB, that financed the Charanka solar power parks project, and GoI, that implemented the project. To enhance the research value and objectivity, the opposing actors, such as the ADB, watchdog NGO representative and independent researcher that conducted the empirical research in the present project location, were also interviewed.

Due to the limited research timeframe, the researcher did not have a chance to visit the project areas, thus, the semi-structured interviews were conducted over Skype in English. Because of the limited time availability of interviewees, the interview duration varied, encouraging the researcher to give priority to the important questions. The overall research duration was four months, out of which one month was dedicated to drafting the interview questions, reaching out to potential interviewees over LinkedIn, a professional networking application, and general internet search engine; and conducting interviews by adjusting to time differences of India, Thailand, the Philippines and Australia. The major hardships included finding relevant interviewees online and getting their confirmations for the interview. Particularly hard was reaching out to the government representatives such as the Gujarat Energy Transmission Corporation Limited (GETCO) that were skeptical in providing research support and refused to be interviewed. The semi-structured interview questionnaires were sent as the alternative approach to Skype interview. Despite the challenges of limited research time and reaching out to the potential interviewees that spoke English, the researcher trusts that the quality of this research is valuable to the Indian energy policies and justice concept debates.

The qualitative research is by itself subjectively influenced. The semi-structured interview allows the interviewees to elaborate on answers in more details leading to unprompted responses (May, 2001, p.134). To be as objective and neutral as possible when collecting and interpreting qualitative data, researchers need to take particular care to minimize the magnitude to which the researcher influences the perspective of the interviewees during the course of the interviews (Ritchie, et. al., 2013, p.20). To ensure the answers of the interviewees were not influenced by the author, when drafting the interview questions, the following criteria were considered: i) simple

wording and short questions; ii) neutrally formulated; iii) non- hypothetical; and iv) being able to be answered positively or negatively (Alshenqeeti, 2014);

The applied questions for interviews were designed based on the gaps of the practical application of the theoretical concept, literature review, and findings from the document analysis (ADB, 1994 & 2012; GIEK, 2010; WCD, 2000; Liebenthal, 2011). The interview questions consist of three key parts. The first part covers questions affiliated with respondents' relation to India's solar energy policy and (Charanka) solar power park case study location. The second part covers interpretation of respondents toward energy justice and its actual implementation in practice. The third part embraces general project challenges, lessons learned and adjustments in the energy policies relevant to solar park projects implementation. Thus, the designed questions covered: i) the relevant ADB safeguards and policies; ii) observation of the energy justice concept implementation in the certain project; and iii) issues related to the project funding, design, planning, development and other project challenges, etc. The sample interview questions are listed in Appendices I and II.

### **3.4.2. Documentary Analysis**

Document analysis is a method for reviewing or evaluating documents—which can be any material including books, photographs, videos, electronic resources, maps, newspapers, etc. Atkinson and Coffey refer to documents as 'social facts', which are generated, shared, and applied in socially organized ways (1997, p. 47). When events can no longer be observed or informants are not reachable, documents can be the most effective tool for collecting data. The case study of the Charanka solar power parks project took place between 2010 and 2015 (ADB, 2018g). Since the researcher did not have a chance to visit the project area to observe and get the primary data from the Affected People (AP) this method was selected to gather that data.

Since the start of the research, February of 2018, the media, document and internet sources were searched through scholar.google.com, Cardiff University's library catalog search, and Web of science. The key search words were: "solar policies in India"; "India's renewable energy policies"; "Gujarat energy policy"; "ADB safeguard policy"; "land acquisition in Charanka/Gujarat"; "legal reports on the land acquisition"; "resistance to Charanka solar project"; "ADB/WB's and Indian renewable policies"; "human rights and Charanka project", etc. Found documents from internet search were

examined for the key words from the EJ's nine principles, e.g. "energy availability", "price affordability" or "lower electricity tariffs", "public participation/meetings"; "environment"; "new jobs", "community resilience", "improved infrastructure"; "resettlement", "land acquisition", "compensation", "complaints", etc.

The project documents are available at no cost to the public through the official website of the ADB (ADB, 2018i). The project documents taken from the website include the Initial Environmental Examination (IEE), Resettlement Plans (RP), Environmental Assessment and Measures, Environmental and Social Monitoring Reports, Summary Poverty Reduction and Social Strategy, etc. the available documents were examined and interpreted based on the EJ conceptual principles. During the document analysis, the researcher faced: i) biased selectivity - the available official documents were presented by the main stakeholders, e.g. ADB and GoI; ii) insufficient details in the application of the EJ in the selected documents. The limits of document analysis include both biased selectivity and insufficient details (Yin, 2014, p. 80). Therefore, the semi-structured interviews were selected to address the limits of the document analysis and combined in the triangulation, 'the combination of methodologies in the study of the same phenomenon' (Denzin, 2017, p. 291).

Annex IV illustrates the table with (media) documentary analysis of all the relevant (electronic) documents.

### **3.5. Research Analysis**

The thematic analysis is often used in the qualitative research, focuses on pinpointing, examining, and documenting patterns or "themes" in data. Application of the thematic analysis fulfills the research objectives while dealing with a wide and large range of data under each category (Ritchie, et. al., 2013, p.202). The gathered interview data were transcribed and analyzed based on the thematic analysis technique, by extracting the key themes from each interview, manually coding them and comparing with the other interview responses; documentary sources and internet articles generate 'texts' in the same way that interviews do, so they all are subjected to the same form of analysis- thematic, to build the whole picture of how energy justice concerns were implemented in the case study through the prism of pre-established conceptual framework (Bryman, 2016). The limitation is that the coding causes a data fragmentation, loss of context and overall narrative (Coffey and Atkinson, 1996). To

lessen the loss of context, coding is done manually over a process of initial open and target coding to determine patterns throughout divisions (Strauss and Corbin, 2008). Through the thematic analysis, Figure 3, it was assured that the three factors were employed: i) the direct contemplation to the research objectives ii) the relevant and distinctive findings; and iii) clear and definite explanation. All research instruments were the subject of examination on the thematic analyses. The key themes were taken from the explanation of the nine principles of the EJ concept and analyzed based on these description themes.

### **3.6. Ethical Requirements**

All the interviews were conducted in English. Before arranging the semi-structured interviews over Skype, this research received approval from the Cardiff University Ethics panel (the ethics form for this study can be found at the front of the research project). Ethic measures include obtaining prior verbal permission of the interviewees, notifying that all interviews would be audio recorded and guarantee the anonymity of interviewees in the presentation of the data.

The next chapter analyzes main policies through the EJ concept to better understand how these policies are implemented in chapter 5.

## **Chapter 4. Renewable Energy Policy Analysis**

This chapter outlines the key renewable energy policies of both ADB and Gol. The organization of the chapter followed by i) the ADB's policy on energy, ii) the key policies and developments of the Gol's policy on renewable (solar) energy, and iii) chapter conclusion. The policies have been examined based on the EJ's nine principles.

### **4.1. ADB Policies**

#### **4.1.1. Introduction**

The Asian Development Bank was established in the 1960s as a financial institution with Asian origins that facilitates economic growth and collaboration in the developing countries. Once the ADB started its operation in 1966, the member countries' institutional capacities were weak after decolonization, courts and legal system were

not working properly, therefore, the bank needed its immunity to work properly and enhance its capacity (Gol, 1992; Respondent #7).

As of today, ADB has 67 members, 48 out of which are from the Asia and Pacific region. The main non-borrowing shareholders of the ADB are Japan with 15.6% share, EU block (Germany, France, Italy, UK) with 10.4% and the USA with 15.6%. (ADB, 2018h). The mission of the ADB is to help its members and partners with loans, technical assistance, grants, and equity investments to endorse social and economic improvement (ADB, 2018o). However, the ADB's technical consultancy services on its safeguard policies are mainly provided by the Western consultants rather than by the member country consultants that are aware of the local needs and project specifics. There are two explanations for such actions: i) the western countries are main financial stakeholders and bank protects their interests; ii) due to the knowledge politics and expertise, the bank gives preference to the Western consultants' technical skills (Respondent #7).

India is a member of the ADB since 1966, and has started borrowing from ADB since 1986. The newly approved ADB-India CPS for 2018-2022 maintains India's mission of prompt, inclusive, and sustainable expansion followed with economic converting and new jobs establishment (ADB, 2018).

#### **4.1.2. ADB Safeguard Policy Statement (SPS)**

The SPS, illustrated in Figure 4.1., outlines standard objectives of ADB's safeguards policies. The SPS that consists of three safeguard policies on the Environment (ENV), Involuntary Resettlement (IR) and Indigenous Peoples (IP), consolidate into a single comprehensive policy that handles environmental and social impacts and risks.

The SPS aims to keep the environment and people away from projects' potential negative impacts through minimizing, mitigating, compensating for negative project impacts on the environment and affected people when avoidance is not feasible (ADB, 2018d).



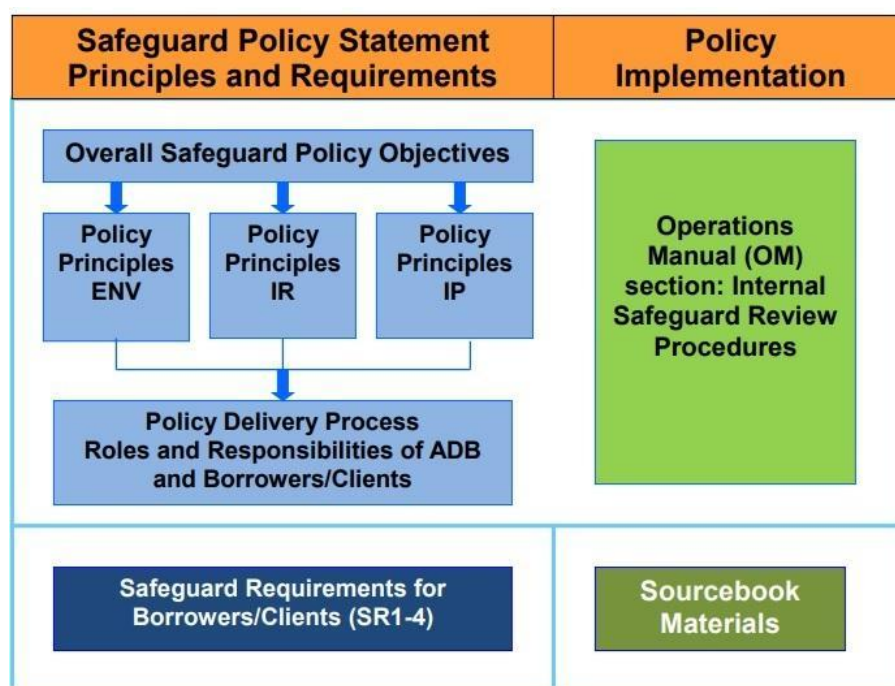


Figure 4.1.ADB- Safeguard Policy Statement. (Source: ADB, 2018 d).

The SPS, which consists of Environment, IR, and IP policies, has categorized each policy based on the project impact as i) A-category of high risk, ii) B-category of medium risk, and iii) C-category of low risk. Each category has its own mitigation measures to comply with (ADB, 2018c).

The SPS supports research question #2 by representing the ADB's sensitivity to EJ framework by meeting five principles out of nine:

- Due process (iii) and Intersectionality (ix) principles consider human rights and community well-being in the production and use of energy which is addressed by SPS's IR and IP;
- Sustainability (v), Intergenerational equity (vi) and Responsibility (vii) principles are addressed by the SPS's Environmental assessment and measures.

#### 4.1.3. ADB's Transparency and Accountability Mechanisms

Transparency in projects is about access to information. The bank's Public Communication Policy (PCP) of 2011 outlines how transparency in projects should be addressed by the bank-funded projects. One measure is to make project documents accessible to the public by publishing the project documents on the ADB website. Besides publishing documents on the website, there are also public meetings in the

affected area should be held. The ADB considers literacy level and language in the communication with the affected people. There are certain criteria, which information to exclude from disclosure, for example, Personal Information, etc (PCP, 2011, para 97).

Accountability is about accepting responsibility for his/her activities and disclose the results in a transparent manner. For this, the ADB has the accountability mechanism, which was designed for dealing with grievances of people affected by a project (ADB, 2012a). An independent and Permanent Panel (Compliance Review Panel) reviews the complaint, sends field experts to evaluate and assess the complaint and makes recommendations to the Board of Directors and monitors their execution.

From 01/2004 till 06/2018, the ADB's Compliance Review Panel (CRP) deemed 71% of received policy violation complaints as "non-eligible" (ADB, 2018e). There have been 16 complaints received about resettlement of which 56.5%(nine complaints) have been eligible. 31 complaints about the compensation of which 38.71% (12 complaints) have been eligible and eight complaints about a land acquisition of which 50% (four complaints) have been eligible by ADB CRP (ADB, 2018f).

#### **4.1.4. ADB's Energy Policy 2009**

The ADB energy policy was updated in 2009, based on its initial version from 1995, voicing the needs of its Developing Member Countries (DMCs) on energy, and reflecting on the overall mission of Strategy 2020: -increase energy security, -assist a country with a low-carbon economy transition, -universal access to energy and free a region from poverty (ADB, 2009, para 13). The ADB's energy policy targets to help its members to maintain secure, accessible, and affordable energy for comprehensive growth in a sustainable way (para 14). It is important to outline this policy in this subchapter to better understand the ADB's motives and representation towards the renewable energy development - research question #1.

Policy implementation is managed through three pillars of the Energy Policy: i) contributing to the energy efficiency and renewable energy; ii) increasing energy access for all; and iii) facilitating the energy sector reform, capacity building, and good governance (paragraph 19). The ADB energy policy does not use the 'Energy Justice' term, but a clear reference to the EJ concept is seen in good governance and energy access for all; as part of ADB's sensitivity to dimensions of EJ – research question #2.

To meet the commercial and residential energy needs, which combined make 30% of total energy demand, ADB supports its DMCs in reforming the energy sector, and establishing legislation for energy efficiency and regulation (para 22). The legislation endorses inclusive growth and improves the environment as part of the ADB's Strategy 2020. The inclusive growth promotes balanced and sustainable economic growth that is beneficial for all and complies with EJ's intersectionality (ix) principle - linking energy justice to socio-economic justice.

The ADB encourages the application of the clean energy technologies through enhancing the awareness, promoting regulative incentives to motivate the use and increase of clean energy, administering funding packages to divide the risk and drop expenses (ADB, 2009, para 23).

Promoting energy efficiency enhancements and renewable energy projects by giving priority to cover as many sectors as possible. This led to (a) lessening the demand of fossil fuels and put pressure on the energy prices, (b) improvement of energy security, and (c) GHG emissions decrease (ADB, 2009, para 15i; ADB, 2018e). These measures support -energy affordability (ii) by putting pressure on the energy prices; -sustainability (v) by decreasing both the use of fossil fuels and GHG emissions; and -intergenerational equity by improving the energy security in a sustainable manner.

Focusing on maintaining energy services to communities and groups for inclusive economic growth helps to eliminate the poverty addressed by the UN's SDGs (UNDP, 2018; ADB, 2009, para 15ii). The SDG 7 targets affordable, reliable, and clean energy for all through modern technologies by 2030. The ADB funds the installation of the small-scale projects, in rural communities, to join them to the electricity grid (ADB, 2015). This target fulfills the availability(i) from the EJ's nine principles by addressing the right of all to the fair access to energy services.

To assist DMCs to switch into a low-carbon economy, ADB supports the mainstreaming climate change mitigation measures by (i) funding projects on decreasing GHG emissions, (ii) integrating carbon footprints of the projects, and (iii) establishing the technical capacity to determine and assess low-carbon development strategies (para 18). These environmental protection measures meet EJ's intergenerational equity and responsibility principles that take care the need of the future generation and minimize environmental threats.

With the consideration of the growing energy demands in Asia due to the growing economic productivities, the ADB reinforces the role of the private energy property to

establish competitive energy market through the Public and Private Partnership (PPP) (ADB, 2009). The ADB encourages privatization through PPP in a consistent and transparent way depending on the specific background of each DMCs (para 41). The provision of ADB's support in research, legislation, technology development, and regulatory frameworks enables its reforms and restructuring establish competitive electricity markets, where consumers can benefit. This way ADB puts effort to regulate the natural monopolies and create competitive energy segment (para 33, 38, 82). A competitive energy sector leads to affordable energy tariffs which support EJ's affordability (ii) principle and increase the availability of energy (i) principle.

All energy sector investments should comply with ADB safeguards policies (Figure 4.1.) on the environment, IR, and IP to guarantee that affected people are kept safe from poverty, and development programs for such vulnerable groups should be integrated and realized. The ADB gives its grants for the realization of small-scale projects on building project resilience among affected people through vocational training e.g. Advanced Project Preparedness for Poverty Reduction - Gujarat Solar Vocational Training and Livelihoods Project (ADB, 2018g; ADB, 2009, para 27). Due process (iii) is reflected in consideration of the rights of the affected people in mitigating project's negative impact/s.

The Indian renewable energy policies and their analysis through the EJ principles are followed in the next subchapter.

## **4.2. The Indian Policies on Renewable (Solar) Energy**

### **4.2.1. Introduction**

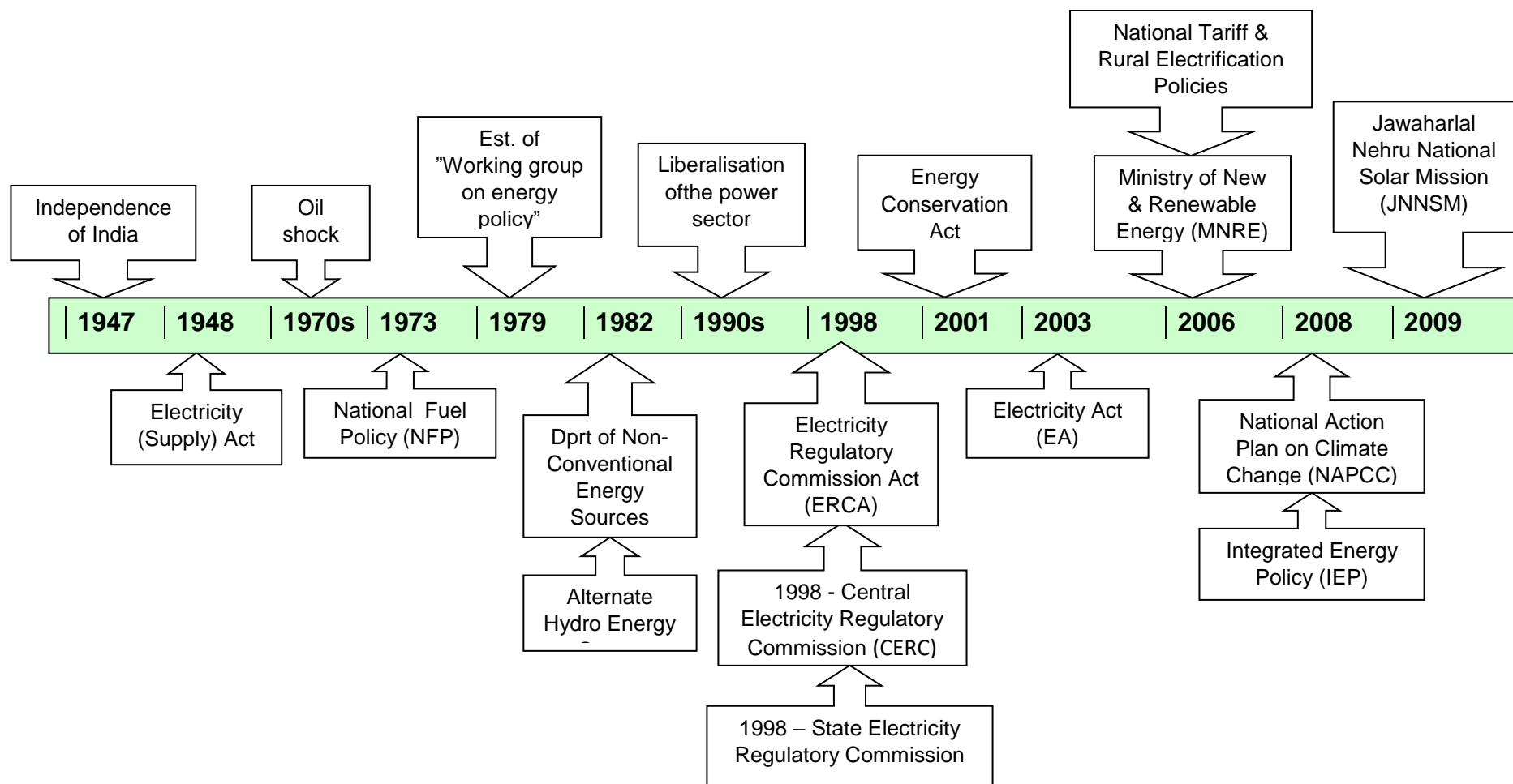
In 2009, India had 11% of the power deficit, including around 100.000 unelectrified villages (17%) and 205 million Indians without electricity access (WB, 2016; 2017; 2013). The country had the world's lowest per capita energy consumption of 639 kWh (Bhatia and Banerjee, 2010, p.7; WB, 2016). Over three-fourths of India's electricity generation came from coal and gas (Bhatia and Banerjee, 2010, p.7). To sustain the needs of both growing population and economic growth, considering fossil fuel limitation pressure and GHG emissions decrease, India has started investing in the renewables. In 2009, India estimated its renewable energy potential at 150GW (WD,

2010, p.6). As of 2017, India's renewable energy potential has about 900GW, out of which 750GW is solar power (Manna and Phil, 2017).

After liberalization of the power sector in the 1990s and establishment of the Electricity Act (EA) in 2003, a number of developments and policies took place to enable renewable (solar) energy development.

The EA 2003 has introduced open access to transmission and distribution system where anyone that has surplus power or one who has requirement of power can pay applicable transmission and distribution charges and use the transmission and distribution for sale directly to consumers or purchase directly from generators.

Diagram 4.2.1 illustrates key energy developments from India's independence until 2009 when the National Action Plan on Climate Change (NAPCC) and Jawaharlal Nehru National Solar Mission (JNNSM) have been established (Mathew, 2003).



**Diagram 4.2.1. Timeline of key energy developments in India until 2009** (Source: compiled by Author)

#### 4.2.2. JNNSM 2009

NAPCC was established in 2008 to execute sustainable economic and environmental goals. It addresses the climate change and environmental challenges at the national level (IEA, 2012). JNNSM policy was established under NAPCC in 2009 to build a solar manufacturing hub located in the western states of Gujarat and Rajasthan. The chosen states are in the sunbelt region, and get 4 to 7 kWh/m<sup>2</sup> per day of a solar energy incidence and sunshine of about 6–8 ha day, in averaging to about 2300 to 3200 h per annually (IEA, 2012).

During phase II, the JNNSM targeted to install 10,000 MW on-grid connection and 1,000 MW off-grid solar power as illustrated in Table 4.2.1., by 2017. The ratio of off-grid to on-grid<sup>3</sup> generated solar power is 1:10, while the ratio of off-grid to on-grid households is roughly 1:4 (WB, 2016). This uneven solar power distribution conflicts with EJ's availability (i) principle.

Segment	Target for Phase I (2010-2013)	Cumulative Target for Phase II (2013-2017)	Target for Phase III (2017-2022)
Utility Grid Power including rooftop	1,000-2,000 MW	4,000-10,000 MW	20,000 MW
Off-grid Solar applications	200 MW	1000 MW	2000 MW
Solar collectors	7 million sq. metres	15 million sq. metres	20 million sq. metres
Focus of the period	Promoting solar thermal and off-grid systems to serve population without access to commercial energy and modest capacity addition in grid-based systems.	Capacity to be ramped up to create conditions for scaled up and competitive solar energy in the country.	Create favorable conditions for solar manufacturing capability, particularly for solar thermal for indigenous production and market leadership.
Objective: To establish India as a global leader in solar energy, by creating the policy conditions for its diffusion across the country as quickly as possible.			

Table 4.2.1. JNNSM capacity targets. (Source: Author);

<sup>3</sup>On-Grid Systems are solar PV systems that only generate power when the utility power grid is available. These systems allow you to store solar power in batteries for use when the power grid goes down or if not on the grid.

JNNSM targets cutting the solar power generation expenses in the country through (i) long-term policy; (ii) large-scale project goals; (iii) persistent Research & Development (R&D); and (iv) domestic manufacturing of key raw materials, parts, and products. It anticipated attaining grid tariff parity by 2022 (JNNSM, 2017).

To meet the JNNSM's ambitious goals and accelerate the solar project development, in 2011 the Union Ministry waived the need to fulfill EIA requirements, which is a systematic process of examining the possible environmental consequences of the projects, programmes and policies, on solar projects (Paliwal, 2006; Gol, 2011). The implementation of the Solar Photovoltaic (PV) power projects does not need environmental clearance from the Ministry (Gol, 2011; Aggarwal, 2017). However, the disposal of PV cells should be implemented under the provisions of Hazardous and Other Waste Rules, 2016. The development of solar parks is under the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981 (Aggarwal, 2017).

Before excluding the need for environmental clearance in 2011, the Ministry of Environment, Forest, and Climate Change made a change to the application of EIA requirements in 2009, exempting public hearings from the EIA requirements (Gol, 2009). While the idea of the EIA requirements, established in 2006 considers EJ's principles of due process and good governance by including public participation in the decision process through public hearings to involve the affected people in the decision-making process. The decisions to first exempt public hearings from the requirements, then later exclude the solar power projects from it accomplish the contrary.

#### **4.2.3. Integrated Energy Policy (IEP) 2008**

The Integrated Energy Policy (IEP), is the first in-depth and consistent energy policy by the national government that supervises all energy sectors, targets at:

- decreasing energy intensity by 20%;
- enlarging average gross efficiency of power production to 34% (from 30.5%);
- meeting the demand for energy services of all sectors, including the energy needs of poor households all over India;
- maintaining secure and convenient energy at the lowest cost in a technically, economically, and environmentally sustainable manner (IEA, 2018).



“IEP is designed to supply, security, access, availability, affordability, pricing, efficiency and environmental aspects of energy” (PC, 2006, p.8); Thus, the policy complies with EJ’s principles of availability (i), affordability (ii), sustainability (v) and responsibility (vii).

#### **4.2.4. The Gujarat Solar Power Policy 2009 & 2015**

Since Gujarat state has beneficial conditions for solar energy development, it established its own policy in 2009 to boost the solar energy and became a frontrunner in solar energy in India. Once Gujarat state received positive response on launched Gujarat Solar Policy-2009, the national and state authorities decided to invest further and exceed its initial targets. Through this policy and JNNSM, the mega solar park in Charanka in Patan district has been realized (Prakash, 2016). The Government of Gujarat (GOG) understood that the commencing price of solar power parks is considerably more expensive than the conventional energy. However, in the long run, solar energy is cheap, clean and green (Prakash, 2016; GOG, 2015).

The Gujarat Solar Power Policy 2009 has been updated in 2015 and promotes following objectives:

1. Advocate for green and clean power and to decrease carbon emission;
2. To decrease the dependency on fossil fuel, and develop energy security in sustainable manner.
3. To assist reducing the price of renewable energy generation;
4. To encourage investment, jobs creation, and skill enhancement in the renewable energy industry;
5. To encourage utilizing barren and uncultivable land;
6. To promote the growth of local manufacturers;
7. To advance research and development and innovation in renewable energy.

The policy objectives overlap with the ADB’s objectives and reflect the EJ’s principles on intergenerational equity (vi), responsibility (vii) and intersectionality (ix) through promoting clean and green energy, decreasing fossil fuel use, builds resilience among the affected communities through job opportunities in renewable energy.

#### 4.2.5. State governments

Both central government and the state have jurisdiction over the electricity subject (Indian Constitution, p.172, para 288-1). However, the laws passed by the central government overrule the laws made by the state legislature (Governance & Administration, 2018). State authorities, Figure 4.2.3., have their energy departments to coordinate their energy issues and market conditions within their jurisdiction, therefore, renewable energy reforms greatly differ across Indian states (IEA, 2007). The State authorities have a key role in renewable energy development due to both local infrastructure and purchase support, which can only be maintained by States.

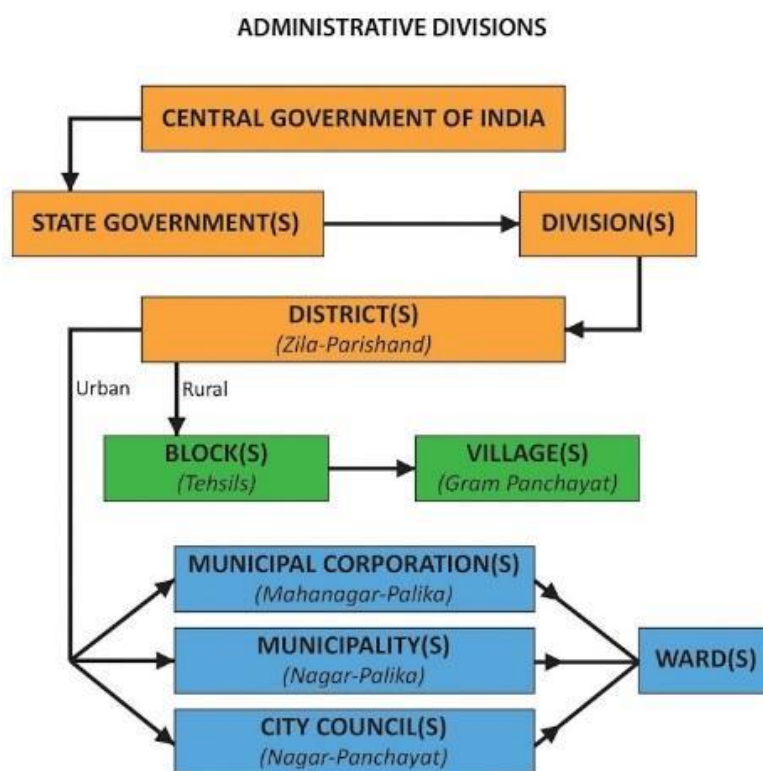


Figure 4.2.3. Administrative divisions. (Source: Governance & Administration, 2018).

Figure 4.2.3. illustrates the top-down governance, from central to town authorities (gram panchayat). A 'Block' (tehsil) is a rural area which presents as an administrative headquarters for a few villages. The villages are governed by Panchayats. No administrative structure at the district level has law-making powers in contrast to the central and the state governments (Governance & Administration, 2018).

### 4.3. Conclusion

Through the ADB's energy policy of 2009 and safeguards policy implementation, the ADB addresses research question #1 -the ADB's objectives to develop the solar energy development in the DMCs by supporting DMCs with a low-carbon economy transition, universal access to energy and eliminate poverty. To boost the renewable energy in the member country, the ADB promotes the energy sector reforms, capacity building and good governance principles, which addresses the research question #2 - ADB's sensitivity to dimensions of EJ by fulfilling good governance and due process principles.

All ADB funded projects need to comply with its safeguard policies on Environment (ENV), IR and IP that regulate and administer the project's environmental and social impacts and risks. Thus, safeguard policies protect the environment and people from projects' potential adverse impacts, when avoidance is not possible, by mitigating and compensating for adverse project impacts on the environment and affected people (ADB, 2018d). This way, safeguards cover research question #2 through due process(iii) by considering the affected people needs, sustainability(v) and responsibility(vii) principles by including the environmental assessment measures.

The renewable energy in India has been inactive until EA 2003, (Diagram 4.2.1.). After enabling EA 2003, a series of regulations and laws pushed Indian solar industry forward. India started focusing on three key policy goals: energy access, energy security, and mitigation of climate change. In 2009, the JNNSM policy was established with the objectives of making India as a global leader in solar energy by creating the policy conditions for its diffusion across the country. Gujarat solar power policy of 2009 was the pioneer policy on the state level endorsing investment in solar parks projects. The success of the Gujarat solar policy enabled GoI to invest and develop solar energy power projects across the country by waiving the environmental clearance approvals from the Ministry and EIA requirements, which is essential for the nature preservation and the public participation as part of the energy justice concept. This chapter introduced some key renewable energy policies relevant to the case study analysis through the EJ's nine principles for chapter 5.

## **Chapter 5. Case study: Charanka Solar Power Park**

### **5.1. Case Study Introduction**

Gujarat is referred to as a “dry state” with beneficial conditions for harvesting solar energy due to its location in sunbelt region with high and direct sun irradiance level (AsiaBiomass, 2014; MNRE, 2014; ADB 2016; ADB, 2018i). The south of the state is surrounded by the Arabian Sea and on the north and east with the harsh dry salt desert (named Rann). The 2,500 hectares Charanka solar park near Charanka village located in the district of Patan, in the north of the state of Gujarat, next to the border with Pakistan (ADB, 2016). The climate is hot (45°C), low rainfall (aver. 568mm), and arid (Gujarat Weather, 2017). The land is partly marshy, dry and seismic unstable. The agricultural and living conditions are harsh and challenging due to the climatic factors and geological risks (ADB, 2016). According to some interviewees, Charanka village area was selected for solar park construction because of its barren and no vegetation land (ADB, 2011, p.9; Respondents #1, 2, 3, 4, 5, 6, 8). The social structure of the Charanka village is under stratification system, where the caste system is still important in the rural areas of India. The village population, total of 1.300 residents, is busy in various occupations as urban professions, livestock pastoral labour, farmers (single season crop: cotton & castor), drivers and small-shop owners (Yenneti et al., 2016; ADB, 2016).

The NAPCC (2008) smoothed the way for the development of the Gujarat solar power park. The construction of the solar park was launched in 2010 under ‘Gujarat Solar Power Policy 2009’ and JNNSM 2009, with an initial operational capacity of 214MW by 2012. Under state coordination, the solar park was expanded to 500MW by 2014 (AsiaBiomass, 2014).

### **5.2. Project Implementation**

Gujarat Power Corporation Limited (GPCL) is the central representative for developing the solar park, Figure 5, while GETCO is authorized to implement the Gujarat Solar Power Transmission Project (the Project) (ADB, 2016). Gujarat state acquires and appoints land, and the GPCL leases the lands to the project developers to generate solar power.

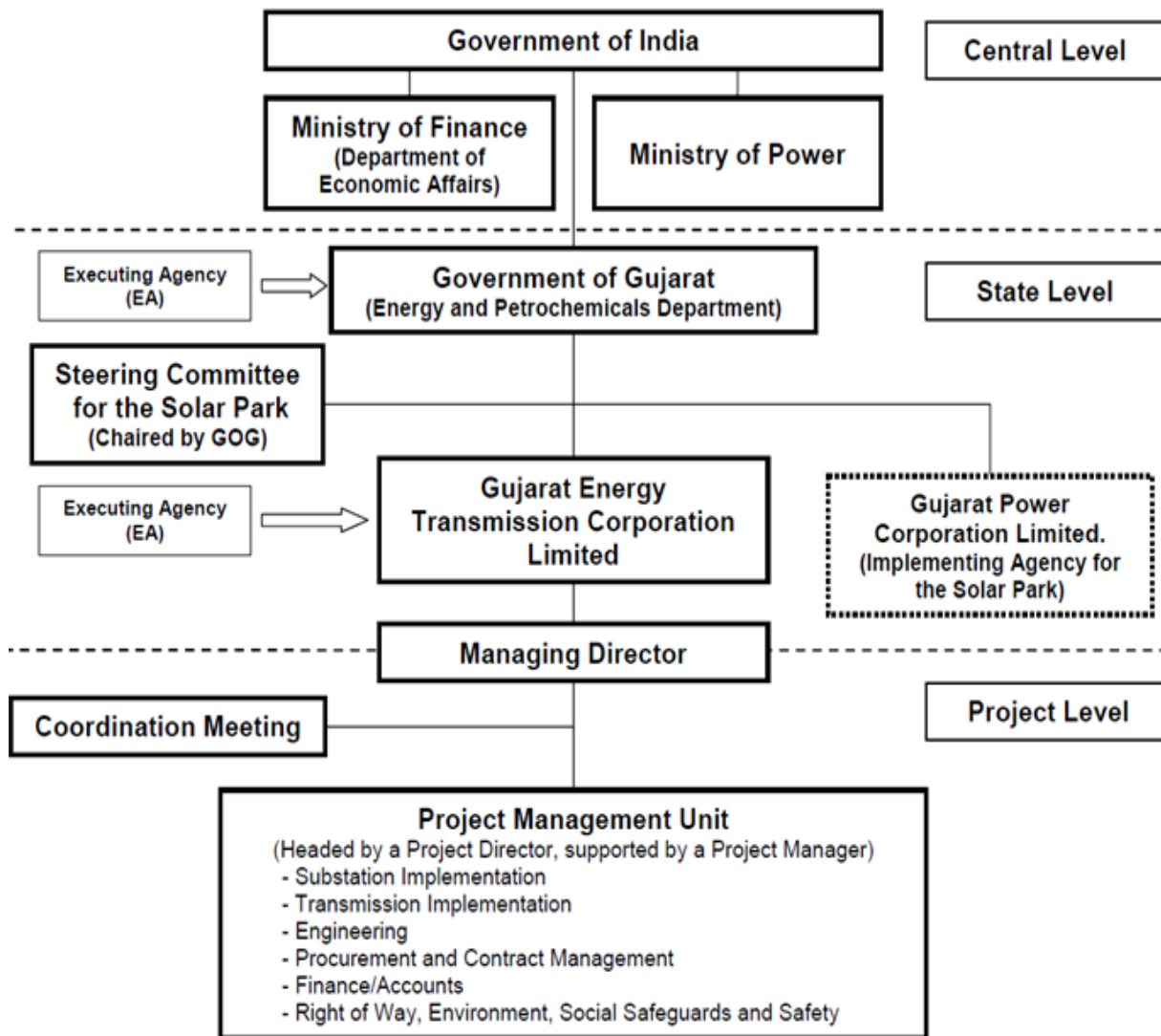


Figure 5. The Charanka Solar Power Park Project Organization Structure. (source: ADB, 2016)

For the development of solar parks, government agencies undertake land acquisition and necessary permits and provide dedicated common infrastructure for setting up solar power generation plants largely in the private sector (MNRE, 2014). It was required by law that the land made available for the solar project would not be alienated for any other purpose and no alteration of the land use would be permitted without consent of the state (Aggarwal, 2017).

The project implementation process is complex and involves three different kinds of institutions in its implementation: i) Project Developers, ii) Engineering, Procurement, and Construction (EPC) contractors and iii) Financial Institutions. All the relevant project details are posted on GETCO web-site, <http://www.getcoqujarat.com>. A Project Management Unit (PMU) is responsible for all social and environmental activities implementation, environmental and social grievances is dealt in accordance with the project Grievance Redress Mechanism (GRM).

According to the ADB, the open and transparent dialogue should be maintained throughout the project to comply with safeguard mechanism. GETCO oversees the project implementation under the IEE and realizing the Environmental Management Plan (EMP) and RP in compliance with ADB's SPS 2009 (Section IX) including occupational health, safety and applicable labor standards compliance (ADB, 2011, p.20).

The financial institutions are those that support the project with financial capital. The projects of such scale are implemented in a Public-Private Partnership type. The Solar Power Transmission Project cost was 134 million, 80 million out of which was shared by the ADB (ADB, 2016, p. 20). The funding is made in the form of loans through lending institutions – public, private and multilateral.

The responsibilities of GETCO toward to ADB includes quarterly and annual reports on the indicator's performance targets and project issues and solutions. The next part of the chapter is analytical, consisting of data analysis from the interviewees, and relevant project and media documents.

### **5.3. Energy Justice conceptual framework analysis of the Charanka Solar Power Park**

This case study, using the research methodology, gathered all relevant data, from interviewees, project documentation, policy analysis, to analyze research questions through the nine principles of the energy justice conceptual framework, Table 2.3.1.

#### ***I. Availability***

About 13% of Indian population is without electricity access (WB, 2016). Many households are still forced to use kerosene for cooking and lighting need. Therefore, the universal access to clean energy services embraced in UN's 7<sup>th</sup>SDG by 2030 has great significance in India (UN in India, 2018). In parallel to the SDGs, the ADB's energy policy 2009 as part of Strategy 2020 incorporates universal access to energy and facilitation to a low-carbon economy transition. International development agencies and the GoI see the correlation of availability of energy to the poor households and improving their living standards; as it makes women's work of cooking and heating their homes easier. (ADB, 2016, p.58; ADB. 2011).

According to the ADB's forecast energy demand will grow double in Asia by 2030, therefore the Bank is interested in addressing the energy deficit through innovative ways of generating power that is sustainable socially, economically and environmentally.

The JNNSM 2009 was the Indian officials' initiative to address the electricity deficit in the country through solar energy development. The JNNSM Phase II developed an Energy Access Scheme to maintain electricity, particularly to the off-grid areas. The objectives of the scheme are to replace non-renewable energy sources, fossil fuels (diesel, kerosene, etc.), with solar energy (Table 4.2.1). The Charanka solar park project, is the product of JNNSM and Gujarat Solar power policy of 2009, was co-financed by the ADB.

JNNSM's phase II targeted (solar) installation capacity of 4,000-10,000 MW by 2017 and 6.762.85 MW was installed by 31.03.2016 (GoI, 2016, p.73, table 2.14).

The rural electrification has been improved from 18.452 unelectrified villages to 13.511 villages between 01.04.2015-19.05.2017 (GoI, 2017, p.7);

The total of 8,061,610 off-grid Solar Photovoltaic System (SPVS) devices have been installed between 31.03.2010 to 31.03.2015 (WB, 2016; Alagh and Chairman, I.R.M.A., 2010). The SPVS devices include solar lanterns, street lighting system, home lighting system, solar cooker and solar pumping system.

Off-grid solar connection through rooftop power plant with the capacity of 206.956,18 KWp<sup>4</sup> per an hour electricity generation have been installed in the rural villages during the same period (31.03.2010 to 31.03.2015) (WB, 2016). The average Indian households use 2.5kWh per a day electricity and 900kWh per a year (Enerdata, 2010); a day the plant generates about 1.655.648kWh. It means about 662.260 Indian households have electricity access through the off-grid solar connection. The representatives of GETCO, ADB and business developers (respondents #1, 2, 3, 4, 5, 6) stated that the project made the access of the rural population to the electricity easy.

## **II. Affordability**

As part of the poverty elimination, the bank facilitates the universal access to the clean energy and affordable energy supply. Once the energy is affordable the quality of life

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<sup>4</sup>**kWp** (kilowatt-peak) is the power of your PV installation, the power that solar panels generate under standard conditions

for women and children improves, more productive and educational opportunities open, as they will be released from the burden of spending hours collecting fuel and doing manual labour (ADB, 2018j).

Since Charanka solar power park project is part of JJNSM, Charanka village residents can witness the benefits of the project e.g. previously citizens were struggling to earn Rs. 50 / day (0.74USD), today the labour is at Rs. 300 / day (4.42USD) (Rathod, 2012; ADB, 2011 d). The average income per month is 9.000Rs (145.45USD) and the average expenditure for electricity per household is around 450 Rs (7.12USD) per month, which is 5% of the monthly income of Charanka villager (ADB, 2016, p.145).

The price for the solar energy falls due to the tough competition, leading its price roughly to be lower than the price of fossil fuels. As of May 2018, the average solar power tariff is 2.4Rs (0.036USD) per unit and cost of coal is 3.7 Rs (0.055USD) per unit (Sushma and Anand, 2018).

The affordability principle of EJ concept states that all people, including the poor households, should pay no more than 10% of their annual income for energy services; the average energy cost of Charanka villager is 5% of annual income, which met the criteria. The affordability is integral to the meaningful availability of energy for all.

### ***III. Due Process***

According to the ADB and GETCO representatives, the resettlement, land acquisition and compensation for land in the Charanka village complied with the ADB's GRM, and land acquisition requirements. Before the Charanka solar power project approval, public consultations took place for the IEE (ADB, 2011, paragraph 12). The Resettlement Plan (ADB, 2011 d, para 27) includes the impact of the transmission lines on crops and trees. IR was categorized B (medium risk) by the ADB as it considered minor by displacement of less than 200 affected people from housing and about 10% of their productive and income source lost. IR and environment components of the project were categorized B, in the IEE report and the Environmental and Social Impacts Assessment (ESIA) study, and required the resettlement plan establishment (ADB, 2016).

No indigenous peoples were expected to be affected in the project area, therefore, safeguard policy on the IP is categorized as C (low risk). For the project implementation, GETCO applied the Land Acquisition Act, 1894 (LAA, amended in



1984), and the National Resettlement and Rehabilitation Policy, 2007; and ADB's Safeguard Policy Statement, 2009 (SPS) (ADB, 2011). The project site did not have any archeological, historical or cultural importance (ADB, 2011, paragraph 138; Table 25: Environmental Impact Matrix). Therefore, corresponding compensations were paid in accordance to the market value for those lands (ADB, 2016).

The public consultation (table A10-1) in the ADB's IEE report, stated that there were no social organizations such as NGOs or civil society have been present in the Charanka village. All decisions are taken by the gram panchayat, village government, with Sarpanch<sup>5</sup> as head, Figure 4.2.3 (ADB, 2016, p. 151);

A Grievance Redress Committee (GRC) consists of representatives from the affected people, the Panchayat Head, and a Project Engineer. The GRC should be conducted when considerable grievances emerge. Minor grievances should be addressed within seven working days if failed it is extended to. 15 working days. If the dispute is still not addressed affected people should approach the relevant court of law for redress (ADB, 2011). It could be the case that the complaint is resolved before it gets official legal notice; because of it, maybe, no legal complaint was registered in the project.

While there were no legal reports filed officially, the Charanka residents experienced the recognitional injustice by i) one-way informative meeting arranged by the authorities that did not engage the affected people in the project decision making process, and ii) the land acquisition notice was published in the local newspaper without mentioning anything about the project (Yenneti & Day, 2015, p.5). IR was assessed minor as it involved less than 200 affected people and affected people were compensated with money, based on the market value in the pre-project stage, for the land and the crop lost; however, this energy development project spurred the price of the land in Charanka village during the project construction stage, leaving the affected people with less compensation money.

In 2011 the ADB's granted money for vocational training to increase the community livelihood and energy-based opportunities. This project's beneficiaries are women from the Charanka and its neighboring villages.

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<sup>5</sup> Sarpanch is an elected head of the village-level statutory institution.

#### ***IV. Transparency and Accountability***

The bank's PCP states that all documents should be made available to the public. In the case of Gujarat Solar Park Project agreements, ESIA, monitoring documents and compensation plans have been published on the ADB's website, all in English language.

The PCP in paragraphs of 24, 26, 47 and 48 assures that the dialogue with project women, children, and vulnerable groups allow them space in project design and participation in pre- and post- project periods (Respondent #7). This policy assesses whether the targeted people's living standards improved or remained equal to the pre-project period. According to Respondent #8, there was an informational meeting, about the project in Charanka, held by local authorities and no ADB staff was involved in public meetings.

However, according to the other sources, the local people were not aware of the project details and no public meeting was held at the pre-project period (Yenneti and Day, 2015; Yenneti et al., 2016). The land acquisition notice at the pre-project stage was given by the state authorities to the affected residents, whereas the majority of the residents are illiterate and were not aware of the project. There were no legal complaints about policy violation filed in the case of Charanka Solar Park, so the ADB Accountability Mechanism mentioned in chapter 4 cannot be evaluated with this case study (ADB, 2018k).

An important tool in assessing the policy violation complaint is conducting site visits by the ADB that need the DMC's consent and can be denied (ADB, 2012a, p.71).

Also, the CRP has no power to stop the project or stop loan disbursement to the country and merely sends a report to the president and vice president with recommendations to resolve the problem. If no agreement between the parties can be reached, the process ends (ADB, 2018l).

#### ***V. Sustainability***

Charanka project has a state-of-the-art design that applies modern and clean technologies. When implementing projects of such scale Gol makes sure that it is done in accordance with the environmental and social requirements (Aggarwal, 2017). The interviewees from the GETCO and ADB representatives responded that all resettlement issues, including indigenous peoples' interests, were examined during the

project realization. According to the ADB's safeguard requirements based on the ESIA study, the project is classified as Category B (medium risk) (ADB, 2011, p 7, para 14-15). Category B includes safeguards on the environment and involuntary resettlement impacts, which was assessed insignificant and required having resettlement plan (ADB, 2011 d). The resettlement plan includes social impacts assessment. The project did not expect to have impacts on IP as it was categorized C (low risks), therefore, no further actions were required (ADB, 2018c; ADB, 2018i).

Upon the project completion, the Charanka villagers have access to the improved infrastructure, including better roads, new school, ambulance services and water supply system in the village (Respondents #1,2,3, 4,5,6; World Bank, 2013, p.108; MNRE, 2014).

Through the educational activities ADB facilitates the project community resilience as some residents lost their land and livelihood, that dealt with the agriculture and farming, so they can benefit from the opportunities that solar park opens for them (ADB, 2018g). For instance, between 2011-2013 the ADB launched 'Advanced project preparedness for poverty reduction – Gujarat Solar vocational training and livelihoods project'; Within that project-frame, the vocational training to some 500 women and youth in 2013 were conducted to boost local employment and teach women and youth how to operate mini-grids set in the rural Gujarat villages (ADB, 2013a). The vocational training targeted groups who have the minimum educational requirements to attend this type of training: a) qualified youth, between the ages of 17 and 25, and b) women that have time, interest and family and/or community support to obtain new skills.

In 2008-2009 the electricity produced by coal/gas/oil was 75% in India (Bhawan and Marg, 2009). While it decreased to 64% in 2018 (Gol, 2018; Baruya, 2017). So, one can say the use of coal and gas for electricity production was only marginally affected. The power generated by renewables in 2009 was in 1.5% (Kumar, et. al., 2014, p.9), while it went up to 20.1% in 2018 for overall in India (Gol, 2018; The Shift Project Data Portal, 2018, page 9, section 26).

## **VI. Intergenerational equity**

This principle is an integral part of sustainability development, defined in the Brundtland Commission (1987), targeting the needs of present and future generations within the planetary boundaries. The absence of clear criteria on how to measure this principle in

practice is challenging in the case of Charanka project. Moreover, the principle overlaps with the accessibility, affordability, sustainability, and responsibility principles that directly reflected on improving the living standards of the affected community to the accessible and affordable energy services in a sustainable way.

The affordability principle has been met as Charanka villagers use 5% of their monthly income on the energy consumption. The price of the average solar power tariff per unit electricity is 2.4Rs (0.036USD) in comparison with the coal cost of 3.7Rs (0.055USD) per unit in May 2018. Leading to overall decrease of fossil fuel (gas and kerosene) consumption and a decrease of the GHG emissions in Charanka village (Sushma and Anand, 2018).

During the IEE required by the ADB, the project area did not have endangered or protected species of flora or fauna. The project location was generally on the barren, uninhabited and unused lands (para 194, p.58), thus the preservation of the environment is taken into account.

The need of people is a crucial part of the sustainable development, and according to the Respondent #8 during the public meetings in the pre-project stage, the government representatives held one-way meetings lacking dialogue and participation of the villagers. The approach of the GoI is top-down focusing on meeting the JJNSM's final targets rather than focusing on the encouraging the democratic public participation and considering the needs of the affected people.

The International Solar Alliance is the initiative of GoI, established in 2015, with the focus on solar power deployment (ISA, 2018). The Charanka mega-scale solar power park is a pioneer project that triggered construction and development of the present ultra-mega scale solar power projects in India. It gave India the confidence to be a leader of the ISA and empowered to design massive solar power projects in accelerated space focusing on the final outcomes rather than endorsing the equal participation of the affected people in the project.

## **VII. Responsibility**

All supranational developing organizations (UN), including bilateral banks (WB, ADB, etc.), international developing aid agencies on the global level are responsible for preserving the natural environment and securing the clean energy through their policy agendas in the developing nations. The mainstream of promoting the clean, and green

energy technologies is to lessen and/or prevent energy-related environmental threats and risks.

Before the ADB approves any energy-related project the consultants conduct the IEE to assess the social and environmental risks of the proposed project (Respondents #1, 2, 3, 6 & 7; ADB, 2018m). The IEE includes project consultants' field visits to assess the project location, topology, demography of the area, climate and natural habitat, design, construction, and operation. The EMP was setup to outline the measures for mitigating the environmental impact e.g. minimizing tree cutting along the transmission lines, avoiding affecting animal sanctuaries, no public utilities like schools and playgrounds were affected (ADB, 2011, p.34; Annex 3-4). The environmental parameters that need to be monitored (air, water, noise and soil quality indicators) were collected and an Environment Monitoring Plan (EMoP) for GETCO was setup that needs to be sent to ADB in regular intervals (ADB, 2011, p.58).

After examination, the project was assessed having a small "environmental footprint". No endangered or protected species of flora or fauna have been reported at the project area. The project was located primarily on the GOG's land, which is generally barren, uninhabited and unused lands, away from the village (ADB, 2011, IEE, para 194, p.58). Therefore, the Charanka solar park project was assessed under Category B (Medium risk) on the Environment and IR on the safeguard categories, and Low risk (Category C) on the IP (ADB, 2018i).

The ADB financed projects are required to conduct IEE, which includes both social and environmental impact assessment at the pre-project stage. However, the Indian Union environment ministry waived the Indian EIA requirements for solar power park projects (Aggarwal, 2017; GoI, 2018a; Sengupta, 2017). The ministry justified its decision stating that EIA is a time-consuming process and delays the JJNSM's schedule. The EIA requirements were substituted with Hazardous and Other Waste Rules (2016) for disposing of PV cells, the Water Act (1974), Air Act (1981) and excluded social component by exempting public participation and public project information disclosure in the EIA process (Aggarwal, 2017; GoI, 2009).

### ***VIII. Resistance***

During the Media and Documentary analysis, the opposition to the project from the affected people and/or within the chain of command implementing the project did not

yield any results. The interviewees including the representatives of the solar business developers, policy consultants, ADB watchdog NGO did not have any knowledge on the project opposition.

The respondents #4 and #8 emphasized that Charanka residents have a high level of illiteracy of 58.42% in 2011 (Census, 2011). The affected people might not be well-educated to know their rights to file the legal complaints against the project developers. The Charanka village doesn't have civil society organizations to voice their concerns if there were any (ADB, 2016, p. 151). The practice of caste system in India could be the reason why no legal complaints were filed. The upper caste people often deny the rights of the lower caste (HRW, 2007).

According to respondent #8, "the meeting arranged by State authorities during the pre-project period were one-way meeting, informing about the project rather than dialogue with the residents".

Another reason for missing legal complaints could be that during the (consultancy) meeting, authorities did not mention public rights in the energy development project and did not encourage the public participation.

## **IX. Intersectionality**

Before proceeding with the assessment of the Charanka case study, it needs to be pointed out that the intersectionality principle is limited and vague in its interpretation as it is not clear on what this principle falls and on whom duties should be placed.

The recognitional justice as stated in the literature review deals with the vulnerable population, e.g. Indigenous Peoples, ethnic minorities, women, etc (ADB, 1998; ADB 2018n). The ADB's safeguard policies, from the pre-project to post-project phases, make sure that the recognitional justice reflected through IEE, ESIA studies, etc.

The ADB through its mission proclaims poverty reduction and inclusive growth, both socio-economic aspects. In the case of the Charanka solar park project, the ADB put a Gender Action Plan (GAP) in place, which included training for employment in transmission and solar power generation for people in the project area, which had the target of 30% women (ADB, 2011c). The GAP included infrastructure measures like electrification of rural areas, installation of street lights and water and sanitation improvements. According to the respondents #2, 4, 5, 6 the Charanka villagers benefit from the project's employment opportunities that increased their monthly income.

However, the created short-term jobs were temporary labour activities for the villagers, rather than technical activities, for which a more skilled labour from outside of the affected village was attracted (Respondent#8).

#### **5.4. Conclusion**

The Charanka solar park is a mega-scale project located at 2.500 hectares of land. The major challenge that the developers faced was private land acquisition. There was no evidence of legal complaint found by online (search) or in project documentation. Furthermore, the government land was expensive, therefore developers decided to acquire private agricultural land reasoning that it was not suitable for agricultural activities (Case Study of Gujarat, 2013, p.168; MNRE, 2014; Yenneti et al., 2016).

The EIA requirements were waived by the Union ministry on all solar power projects as EIA were delaying implementation (Aggarwal, 2017). By removing the socio-economic component of the EIA requirements, at a pre-project stage, and replacing them with Hazardous and Other Waste Rules (2016) for disposing of PV cells, the Water Act (1974), Air Act (1981) kept the environmental aspect of the EIA. The socio-economic component of the EIA assesses the impacts on the local community including demographic changes, economic status, human health, and the need to hold public hearings (Gol, 2018a; Sengupta, 2017). This raises EJ concerns mainly on due process, transparency, and intersectionality principles.

In the case of Charanka, a lack of transparency has been observed. Most of the affected people weren't aware of the project nor what their land was acquired for. The "land acquire act" only states that a public notice had to be given, which was an announcement in a newspaper; whereas, the project area had a high level of illiteracy (58.42%) in 2011. Lack of knowledge about the project also leads to selling the land at a cheaper price. People with knowledge of the project plans could make a profit by buying land from people without information at a lower land value because they had an information advantage. It also affected the EJ's resistance principle, since many affected people in the area weren't aware till the trucks for the construction came to their village (Yenneti and Day, 2015). Once a project started it is usually harder to stop or change it, particularly if the village doesn't have civil society organization that could have challenged the interests of the dominants.

However, the advantages of the project are big and benefited a number of stakeholders, including government, private developers, financial institutions and the society overall. The improved infrastructures are better roads, water facility, emission reduction, a unique integration of smart grid characteristics in the design, government wasteland development, socio-economical improvements of the Charanka residents (ADB, 2016; MNRE, 2014; WB, 2013). According to the interviewees (Respondents #2,3,4,5,6) the benefits of the project outweighed the project challenges and burdens. It is a case, when GoI, based on the utilitarian ethics<sup>6</sup> and its top-down approach, persuaded the interests and benefits of many by overriding the disadvantages of few in this project.

Thus, the Charanka solar park project, is the national pride of India, was the pioneer of large-scale solar parks that gave a hope for the Indian energy independence. The success of the project allowed GoI to go into 'Ultra Mega Solar' scheme development (Pentland, 2014). However, as per the nine principles of EJ conceptual framework's analysis, the social aspect was waived or ignored in order to stick to the ambitious targets of the GoI. The GoI's energy policies target the energy access for all. Waiving the EIA process (particularly the social component) led to the procedural injustice that conflicts with outcomes of the GoI's policies. The role of the ADB is crucial not only to loan money for green energy development through facilitating the Bank's safeguard policies but also make sure that safeguards are implemented at the higher standards. The next chapter provides conclusion and recommendations for the application of the energy justice in the energy projects.

## **Chapter 6. Recommendation and Conclusion**

### **6.1.1. Reflection on the application of the EJ principle**

The last two chapters were analysed through the EJ conceptual framework and this subchapter reflects on its practical application. The challenges encountered during the principles' analysis were their abstract definition, general and diluted description. Some of the principle's descriptions were repeated and overlapped. For instance, Transparency and Accountability and Due Process both present the procedural justice.

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<sup>6</sup> The utilitarian ethics is about the morality of actions that maximizes utility, or happiness, for the greatest number of people.



Transparency & Accountability principle should be represented under “Good Governance” as the transparency stands for information disclosure to the public, while the accountability is accepting responsibility for its activities.

The descriptions outlined in sustainability, intergenerational equity, and responsibility principles are reflected in the sustainable development values defined in the Brundtland Commission (1987), where sustainability principles cover the need of the present generation, intragenerational equity covers the need of the future generation, and responsibility covers those needs to be met within the planetary boundaries. The definition of these principles is general without certain measures or conditions attached, e.g. for sustainability’s “depletion with consideration for savings”, how to measure and achieve it in practice is a challenging task.

The Intersectionality principle is very broad in its definition and not clear how to measure, on what or whom these principles fall, and on whom duties could be placed. Possible clearer assessment criteria and targets would have significantly improved the EJ application in the empirical case study.

### **6.1.2. Discussions**

The ADB represents its objectives for solar energy development in India through its mission, which includes: -increase energy security, -assist a country with a low-carbon economy transition, -universal access to energy and free a region from poverty (ADB, 2009, para 13).

The representatives of the ADB are sensitive to the EJ dimensions from the transparency and accountability e.g. grievance redress mechanism, safeguard policies and energy policy of 2009.

There is a gap between what is stated in the policy and how it’s actually implemented. Since the ADB deals with the developing nations, where issues with the social justice and human rights are often neglected, the bank issues appropriate safeguards and policies that take into account those social injustices while implementing its projects in the developing nations. The ADB policies are well designed and include these EJ dimensions, however it is up to the project developer (the developing nation) to fully follow those requirements rather than just use it as a “checklist”.

During the case study analysis, no resistance was yielded in the form of the legal complaints or at the chain of command.

As a result, a Good Governance factor is the crucial part of the EJ and both ADB and Gol should make sure that it should be implemented at the high standards, rather than a checklist. From the institutional perspective, good governance is the partnership of state, private (business) sector with the public (civil society/NGOs) sector. The disbalance or the limited partnership of these three pillars may cause serious consequences in governance.

Chapter 5 illustrated that the information is vital in meeting the transparency factor of the EJ. Insufficiency in informing people about the energy project leads to the procedural injustice. It is very important to pay attention to the used language in the policy to avoid misinterpretation and taking responsibility (Cowell et al., 2016, p.14). In the Charanka case, the population majority was illiterate, thus, conducting consultation meetings locally would have been advised to endorse the public participation, avoid land speculation, and fair compensation for land.

It could be that the absence of the civil society in Charanka village, application of the caste stratification, or lack of project information in an accessible way and exclusion from the decision-making process disabled the villagers to raise their concerns and caused no public resistance or filing the legal complaints against the development and construction of the solar power plant. These pre-existing socio-economic conditions, e.g. absence of civil society, application of caste system, high illiterate level among population are reflected in the EJ evaluation.

Furthermore, this project was the Indian prime minister's pet project and supported by the central and state authorities, no trace of the resistance within the chain of command has been yielded. The resistance as a mechanism is the integral part of the EJ through which emerged injustice should be addressed and mitigated rather than suppressed. As a result, the transparency principle is a crucial point that affects the EJ's resistance principle. Due to lack of information, resistance to a project might not appear or appear too late to alter how the project is being implemented.

Accountability is a grievance mechanism that should keep the energy development implementers responsible for their adverse activities and behaviors towards the affected people. Therefore, the roles of the NGOs are crucial in protecting affected people and communities by naming and shaming such adverse activities. It is important for the NGOs to monitor the compliance of the grievance mechanism procedures and policies during energy developing projects.

A significant part of the EJ concept is to nurture the “human dimension” in energy developing projects. As Heffron and McCauley stated: “the EJ is concerned with social responsibility by the private sector, the government and the public” (2014, p 437).

## **6.2. Recommendation**

Recommendations are generated based on the research findings and the gap in policy implementation. The energy experts and decision-makers should be led by energy justice principles with the participation of the affected people in policy-making and decision-making processes.

The distribution of information about projects should take into consideration literacy levels, access to public information technologies (newspapers, internet) and language to maximize distribution among the different layers of the affected population.

Due process should be considered in the energy production and use, where the decision-making process is transparent and accountable. Energy resources should be used with the discussion for savings, boosting community, and ensuring, and acknowledging the equitable dissemination of energy services (and costs) among current and next generations, where everyone has a right to fairly access energy services.

The role of the ADB is advisory, facilitating and monitoring in the developing countries, while the Bank still keeps its immunity among its members. The civil society/watchdog NGOs, DMCs, and academia need to question the Bank’s immunity, keep its activities accountable, demand the implementation of its safeguards at the highest standards and use of good language in policies to avoid delusion and vagueness. It is expected that the bank realizes the Policy, instead of applying arbitrary language as loopholes to escape policy requirements’ compliance (Respondent #7, Oxfam Australia, 2010). Both the ADB and Gol are responsible for the language and spirit of Policy as the ADB has the freedom to establish safeguard mechanisms operations further than just limited framework of the Policy (Oxfam Australia, 2010). The safeguard policies need to be extended and include new issues e.g. labour standards, migration, gender rights, etc (Respondent #7).

According to the Independent Evaluation Department, overall safeguard consultants spend 80% of their time reading and examining the project documents (Respondent #7; ADB, 2015 a, p 8, Figure #11). Thus, the bank should encourage its safeguard

policy consultants to make more field visits and realize the ADB's Public Communications Policy by interacting with affected people to build a dialogue to better communicate, spread the project information, and knowledge (ADB, 2011, para 24; Cowell et al., 2016, p.14).

The watchdog NGOs should constantly monitor bank's activities, build community capacity, holding the bank accountable in terms of the public opinion, establish social-economic and environmental consciousness among affected people by identifying project impacts, narrating the local projects by naming and shaming method, and challenging ADB's immunity (Respondent #7). All those measures are on-going processes and need to train citizens to keep both the ADB and the Government accountable and transparent in front of people. Therefore, the role of the ADB safeguard consultants are very crucial to check and monitor the quality of the project compliance with the bank policies and requirements.

### **6.3. Limitations and Areas for Further Research**

#### **6.3.1. Limitations**

The research limitations include limited research time and inability to make the field visits. It was hard to find and get in contact with the representatives of the Gol within the allocated research timeframe. Many of the representatives were skeptical to support this research. Furthermore, the field visit to Charanka village was not realized due to the lack of time, inability to communicate in the local language and time-consuming Indian visa requirements. However, these limitations are overcome with the use of triangulation method, the relevant documentation available in English and Skype interviews with various stakeholders.

#### **6.3.2. Areas for Further Research**

The development of the renewable energy is growing in the developing nations; thus, the question of energy justice is a very real one in the energy transition process. The research findings emphasize the role of the good governance in the policy framing and its application. The areas for the future research include further research and investigation of the Indian institutional capacity towards to the developing community

ownership in the renewable projects as a way of encouraging the affected people's participation in such scale projects (Forman, 2017). The institutional capacity should include the availability of the civil society organizations that raise the concerns of the affected people. For example, how to increase public participation? How to develop the community ownership in the renewable energy projects? How to ensure policies are not exploited in the energy justice projects?

The demographic and sociocultural specifications of the developing nations need to be considered, e.g. the caste system, while investigating the community ownership application.

## REFERENCE:

- ADB & GETCO, 2011. Project Administration Manual. India: Gujarat Solar Power Transmission Project. Retrieved from <https://www.adb.org/sites/default/files/project-document/61201/44431-013-ind-pam.pdf> (Accessed May 15, 2018);
- ADB, 1994. "Handbook for Incorporation of Social Dimensions in Projects." Manila: Asian Development Bank (Social Development Unit);
- ADB, 1998. The Bank's policy on indigenous peoples. Retrieved from <https://www.adb.org/sites/default/files/institutional-document/33441/files/policy-indigenous-peoples.pdf> (Accessed on May 14, 2018);
- ADB, 2009. Energy Policy. Retrieved from <https://www.adb.org/documents/energy-policy> (Accessed on April 23, 2018);
- ADB, 2011. Initial Environmental Examination. IND: Gujarat Solar Power Transmission Project. Retrieved from <https://www.adb.org/sites/default/files/project-document/61822/44431-013-ind-iee-01.pdf> (Accessed on June 1, 2018);
- ADB, 2011a. Key Terms and Conditions for the India Solar Power Generation Guarantee Facility (Guarantee Facility). Retrieved from <https://www.adb.org/sites/default/files/project-document/61518/44941-01-ind-sa.pdf> (Accessed on 06.04.2018);
- ADB, 2011b. Project Administration Manual. India: Gujarat Solar Power Transmission Project. Retrieved from <https://www.adb.org/sites/default/files/project-document/61201/44431-013-ind-pam.pdf> (Accessed on May 27, 2018);
- ADB, 2011 c. Gender Action Plan. Retrieved from <https://www.adb.org/sites/default/files/project-document/61032/44431-013-ind-gap.pdf> (Accessed on June 1, 2018);
- ADB, 2011 d. Resettlement Plan. Retrieved from <https://www.adb.org/sites/default/files/project-document/61796/44431-013-ind-rp-draft-01.pdf> (Accessed on May 31, 2018)
- ADB, 2012. 'Gender Tool Kit: Energy. Going beyond the Meter.' Manila: Asian Development Bank.
- ADB, 2012 a. Accountability Mechanism Policy. Retrieved from <https://www.adb.org/sites/default/files/institutional-document/328211/accountability-mechanism-policy-2012.pdf> (Accessed on May 31, 2018);
- ADB, 2013. Draft report and recommendation of the president to the board of directors. Proposed multi-tranche financing facility and technical assistance grant and administration of loan. India: Rajasthan renewable energy transmission investment

program. Retrieved from

[https://www.climateinvestmentfunds.org/sites/default/files/Draft%20RRP%20-%20Reviewed%2025%20June%20submission\\_JA.pdf](https://www.climateinvestmentfunds.org/sites/default/files/Draft%20RRP%20-%20Reviewed%2025%20June%20submission_JA.pdf) (Accessed on May 9, 2018);

- ADB, 2013a. ADB Knowledge Showcases. Thorough planning of solar park mitigates risk for investors, locals;
- ADB, 2015. ADB supports scale up of off-grid solar power systems in rural India. Retrieved from <https://www.adb.org/news/adb-supports-scale-offgrid-solar-power-systems-rural-india> (Accessed on May 31, 2018);
- ADB, 2015 a. Safeguards Operational Review, Linked Document C. Results from a project officer questionnaire on project specific safeguard issues. Retrieved from <https://www.adb.org/sites/default/files/linked-documents/C-Results-Questionnaire-Safeguard-Issues.pdf> (Accessed on June 1, 2018);
- ADB, 2016. Initial Environment Examination. IND: Gujarat Solar Power Transmission Project. Gujarat Energy Transmission Corporation Limited (GETCO);
- ADB, 2016 a. ADB, USAID to Collaborate on Developing Clean Energy Infrastructure in India. Retrieved from <https://www.adb.org/news/adb-usaid-collaborate-developing-clean-energy-infrastructure-india> (Accessed on April 23, 2018);
- ADB, 2018. India and ADB. Retrieved from <https://www.adb.org/countries/india/main> (Accessed on 23.03.2018);
- ADB, 2018 a. History Book Marking 50 Years of ADB Launched in India. Retrieved from <https://www.adb.org/news/history-book-marking-50-years-adb-launched-india> (Accessed on April 23, 2018);
- ADB, 2018 c. Safeguard Categories. Retrieved from <https://www.adb.org/site/safeguards/safeguard-categories> (Accessed on May 31, 2018);
- ADB, 2018 d. Safeguards Documents. Retrieved from <https://www.adb.org/site/safeguards/safeguards-documents> (Accessed on May 31, 2018);
- ADB, 2018 e. Clean Energy. Retrieved from <https://www.adb.org/sectors/energy/issues/clean-energy> (Accessed on May 31, 2018);
- ADB, 2018 e. Fast Facts: Accountability Mechanism. Retrieved from <https://www.adb.org/site/accountability-mechanism/problem-solving-function/fast-facts> (Accessed on May 31, 2018);
- ADB, 2018 f. Complaints Registry by Year. Retrieved from <https://www.adb.org/site/accountability-mechanism/problem-solving-function/complaint-registry-year> (Accessed on May 31, 2018);

- ADB, 2018 g. India: Advanced Project Preparedness for Poverty Reduction – Gujarat Solar Vocational Training and Livelihoods Project (Subproject 14). Retrieved from <https://www.adb.org/projects/43166-194/main#project-pds> (Accessed on May 31, 2018);
- ADB, 2018 h. Shareholders. Retrieved from <https://www.adb.org/site/investors/credit-fundamentals/shareholders> (Accessed on May 31, 2018);
- ADB, 2018 i. India: Gujarat Solar Power Transmission Project. Retrieved from <https://www.adb.org/projects/44431-013/main#project-documents> (Accessed on May 31, 2018);
- ADB, 2018 j. Access to Energy. Retrieved from <https://www.adb.org/sectors/energy/issues/access-energy> (Accessed on May 31, 2018);
- ADB, 2018 k. Complaints Registry by Year. Retrieved from <https://www.adb.org/site/accountability-mechanism/problem-solving-function/complaint-registry-year> (Accessed on May 31, 2018);
- ADB, 2018 l. The Problem Solving Process. Retrieved from <https://www.adb.org/site/accountability-mechanism/problem-solving-function/problem-solving-process> (Accessed on June 1, 2018);
- ADB, 2018 m. Environment Safeguards. Retrieved from <https://www.adb.org/site/safeguards/environment> (Accessed on June 1, 2018);
- ADB, 2018 n. Indigenous Peoples. Retrieved from <https://www.adb.org/site/safeguards/indigenous-peoples> (Accessed on June 1, 2018);
- ADB, 2018 o. Who we are. Retrieved from <https://www.adb.org/about/main> (Accessed on April 23, 2018);
- Aggarwal, M., 2017. Government eases environmental clearance rules for solar power projects, parks. Retrieved from <https://www.livemint.com/Politics/QW4cJ9yjhmvUtOZCPyOt3J/Govt-eases-environment-clearance-rules-for-solar-projects.html> (Accessed on May 13, 2018);
- Alagh, Y. and Chairman, I.R.M.A., 2010. Transmission and Distribution of Electricity in India Regulation, Investment and Efficiency. Retrieved from <https://www.oecd.org/development/development-philanthropy/46235043.pdf> (Accessed on May 31, 2018);
- Alshenqeeti, H., 2014. Interviewing as a data collection method: A critical review. *English Linguistics Research*, 3(1), p.39.
- AsiaBiomass, 2014. Construction of the Largest Solar Park in Asia is Underway in India. Retrieved from [https://www.asiabiomass.jp/english/topics/1403\\_05.html](https://www.asiabiomass.jp/english/topics/1403_05.html) (Accessed May 9, 2018);



- Atkinson, P. A. & Coffey, A., 1997. Analysing documentary realities. In D. Silverman (Ed.), *Qualitative research: Theory, method and practice*, London: Sage, 45–62;
- Bagchi, A., 2007. Role of planning and the planning commission in the New Indian economy: case for a review. *Economic and political Weekly*, pp.92-100;
- Baruya P., 2017. International finance for coal-fired power plants. IEA Clean Coal Center. Retrieved from <https://www.usea.org/sites/default/files/International%20finance%20for%20coal%20fired%20power%20plants%20-%20ccc277.pdf> (Accessed on May 31, 2018)
- BBC news, 2002. Gujarat victory heartens nationalists. Retrieved from [http://news.bbc.co.uk/2/hi/south\\_asia/2576855.stm](http://news.bbc.co.uk/2/hi/south_asia/2576855.stm) (Accessed on May 10, 2018);
- Benecke, E. (2011). "Networking for climate change: agency in the context of renewable energy governance in India." *International Environmental Agreements: Politics, Law and Economics*, 11(1): 23-42.
- Bhatia, M. and Banerjee, S.G., 2010. Unleashing the potential of renewable energy in India. Energy Sector Management Assistance Program. World Bank Publications. Retrieved from [http://siteresources.worldbank.org/EXTENERGY2/Resources/Unleashing\\_potential\\_of\\_renewables\\_in\\_India.pdf](http://siteresources.worldbank.org/EXTENERGY2/Resources/Unleashing_potential_of_renewables_in_India.pdf) (Accessed on May 25, 2018);
- Bhattacharyya, S. C. (2010). "Shaping a sustainable energy future for India: Management challenges." *Energy Policy*, 38(8): 4173-4185.
- Bhawan S.S. and Marg R., 2009. Gol. Ministry of Power. Annual Report 2008-2009. Power for All. Retrieved from [https://powermin.nic.in/sites/default/files/uploads/Annual\\_Report\\_2008-09\\_English.pdf](https://powermin.nic.in/sites/default/files/uploads/Annual_Report_2008-09_English.pdf) (Accessed on June 1, 2018);
- BP Statistical Review of World Energy, 2017. Retrieved from [https://www.bp.com/content/dam/bp-country/de\\_ch/PDF/bp-statistical-review-of-world-energy-2017-full-report.pdf](https://www.bp.com/content/dam/bp-country/de_ch/PDF/bp-statistical-review-of-world-energy-2017-full-report.pdf) (Accessed on May 3, 2018);
- Bryman, A., 2016. *Social research methods*, 5th Edition. ed. Oxford University Press, London.
- Case Study of Gujarat, 2013. Chapter 5. Retrieved from [http://shodhganga.inflibnet.ac.in/bitstream/10603/183604/15/15\\_chapter5.pdf](http://shodhganga.inflibnet.ac.in/bitstream/10603/183604/15/15_chapter5.pdf) (Accessed on May 15, 2018);
- Census, 2011. Charanka Population – Patan, Gujarat. Retrieved from <http://www.census2011.co.in/data/village/508604-charanka-gujarat.html> (Accessed on June 1, 2018);
- Coffey, A., Atkinson, P., 1996. *Making sense of qualitative data: Complementary research strategies*. Sage, Thousand Oaks, CA.

- Corbin, J. and Strauss, A., 2008. Basics of qualitative research: Techniques and procedures for developing grounded theory.
- Cowell, R.J.W., Devine-Wright, P. and Devine-Wright, H., 2016. What do we know about overcoming barriers to infrastructure siting in local areas?.
- Cowell, R., 2016. Global Energy Justice: Problems, Principles, and Practices.
- Cowell, R., Bristow, G. and Munday, M., 2011. Acceptance, acceptability and environmental justice: the role of community benefits in wind energy development. *Journal of Environmental Planning and Management*, 54(4), pp.539-557.
- Denzin, N.K., 2017. The research act: A theoretical introduction to sociological methods. Routledge.
- Elzen, B., Geels, F.W. and Green, K. eds., 2004. System innovation and the transition to sustainability: theory, evidence and policy. Edward Elgar Publishing.
- Forman, A., 2017. Energy justice at the end of the wire: Enacting community energy and equity in Wales. *Energy Policy*, 107, pp.649-657.
- Enerdata, 2010. Average household electricity use around the world. Retrieved from <http://shrinkthatfootprint.com/average-household-electricity-consumption> (Accessed on May 31, 2018);
- Foxon, T.J., 2011. A coevolutionary framework for analysing a transition to a sustainable low carbon economy. *Ecological Economics*, 70(12), pp.2258-2267.
- Garanti-instituttet for eksportkreditt, GIEK, 2010. "Questionnaire on Social and Human Rights Impacts: Hydro Power, Renewable Energy, and other Power Projects." Oslo: GIEK.
- Geels, F.W., 2004. From sectoral systems of innovation to socio-technical systems: insights about dynamics and change from sociology and institutional theory. *Research Policy* 33 (6/7), 897–920.
- Geels, F.W., 2010. Ontologies, socio-technical transitions (to sustainability), and the multi-level perspective. *Research policy*, 39(4), pp.495-510.
- GoI, 2009. Ministry of Environment and Forest. Office Memorandum on Consideration of projects under Clause 7(ii) of the EIA Notification, 2006 – exemption of Public Hearing – Instructions Regarding. Retrieved from [http://www.moef.nic.in/divisions/iass/offc\\_memo\\_instruction.pdf](http://www.moef.nic.in/divisions/iass/offc_memo_instruction.pdf) (Accessed on May 26, 2018);
- GoI, 2011. Ministry of Environment and Forests. Office Memorandum on Applicability of environmental clearance for Solar Photo Voltaic (PV) Power Projects – Regarding. Retrieved from <http://envfor.nic.in/sites/default/files/OM-SolarPV.pdf> (Accessed on May 26, 2018);

- Gol, 2016. Ministry of power. Central electricity Authority. Draft National electricity plan; Volume 1. Retrieved from [http://cea.nic.in/reports/committee/nep/nep\\_dec.pdf](http://cea.nic.in/reports/committee/nep/nep_dec.pdf) (Accessed on May 27, 2018);
- Gol, 2017. Achievements and Initiatives of Ministries of Power, coal, New & renewable energy and Mines. Ujwal Bharat 3 years. Retrieved from [https://powermin.nic.in/sites/default/files/webform/notices/Ujwal\\_Bharat\\_3\\_Year\\_Brochure\\_English\\_spread\\_0.pdf](https://powermin.nic.in/sites/default/files/webform/notices/Ujwal_Bharat_3_Year_Brochure_English_spread_0.pdf) (Accessed on May 27, 2018);
- Gol, 2018. Ministry of Power. Power Sector at a Glance All India. Retrieved from <https://powermin.nic.in/en/content/power-sector-glance-all-india> (Accessed on June 1, 2018)
- Gol, 2018a. Ministry of Environment, Forest and Climate Change. EIA, Chapter 1. Retrieved from <http://envfor.nic.in/divisions/iass/eia/Chapter1.htm> (Accessed on June 2, 2018);
- Gol, 1992. Ministry of Finance. Department of Economic Affairs. Agreement between Gol and ADB regarding the Resident office of the ADB. Retrieved from [https://dea.gov.in/sites/default/files/4-ADB-Mission\\_1.pdf](https://dea.gov.in/sites/default/files/4-ADB-Mission_1.pdf) (Accessed on May 31, 2018);
- Governance & Administration, 2018. The Civil India. Retrieved from <http://www.thecivilindia.com/thecivilindia/pages/governance/country.html> (Accessed on May 4, 2018);
- Gujarat Weather, 2017. District wise rainfall figures over whole Gujarat. Retrieved from [http://www.gujaratweather.com/wordpress/?page\\_id=15265](http://www.gujaratweather.com/wordpress/?page_id=15265) (Accessed on May 31, 2018);
- Guttal, S., 2000. Creating Poverty: The ADB in Asia. The ADB: shape up or ship out. Retrieved from [https://www.iatp.org/files/Creating\\_Poverty\\_The\\_ADB\\_in\\_Asia.html](https://www.iatp.org/files/Creating_Poverty_The_ADB_in_Asia.html) (Accessed on April 23, 2018);
- Halbfass, W., 1988. India and Europe (p. 74). New York: State University of New York Press.
- Harish S. M. and Raghavan S. V, 2011. Redesigning the National Solar Mission for Rural India. Center for Study of Science, Technology & Policy. Retrieved from [http://www.cstep.in/uploads/default/files/publications/stuff/CSTEP\\_Reducing\\_the\\_National\\_Solar\\_Mission\\_for\\_Rural\\_India\\_JA\\_2011.pdf](http://www.cstep.in/uploads/default/files/publications/stuff/CSTEP_Reducing_the_National_Solar_Mission_for_Rural_India_JA_2011.pdf) (Accessed on May 31, 2018);
- Heffron, R.J. and McCauley, D., 2017. The concept of energy justice across the disciplines. Energy Policy, 105, pp.658-667.

- HRW, 2007. Hidden Apartheid, Caste Discrimination against India's "Untouchables". Retrieved from <https://www.hrw.org/report/2007/02/12/hidden-apartheid/caste-discrimination-against-indias-untouchables> (Accessed on June 1, 2018);
- IEA, 2018. Integrated Energy Policy. National Energy Policy (NEP). Retrieved from <https://www.iea.org/policiesandmeasures/pams/india/name-23687-en.php> (Accessed on May 26, 2018);
- Indian Constitution, 1949. Retrieved from [https://www.india.gov.in/sites/upload\\_files/npi/files/coi\\_part\\_full.pdf](https://www.india.gov.in/sites/upload_files/npi/files/coi_part_full.pdf) (Accessed on May 26, 2018);
- International Energy Agency (IEA) and World Bank, 2017. "Sustainable Energy for All 2017-Progress toward Sustainable Energy." World Bank, Washington DC;
- International Energy Agency (IEA), 2012. Partner Country series. Understanding Energy Challenges in India: Policy, Players and Issues. IEA, France. Retrieved from [https://www.iea.org/publications/freepublications/publication/India\\_study\\_FINAL\\_WEB.pdf](https://www.iea.org/publications/freepublications/publication/India_study_FINAL_WEB.pdf) (Accessed April 29, 2018);
- ISA, 2018. About ISA. Retrieved from <http://isolaralliance.org/> (Accessed on May 31, 2018);
- Jaffrelot, C., 2003. Communal Riots in Gujarat: The State at Risk?.
- Jenkins, K., Heffron, R.J. and McCauley, D., 2016a. The political economy of energy justice: A nuclear energy perspective. In the Palgrave Handbook of the International Political Economy of Energy (pp. 661-682). Palgrave Macmillan, London.
- Jenkins, K., McCauley, D. and Forman, A., 2017. Energy justice: a policy approach. Energy Policy, 105, pp.631-634.
- Jenkins, K., McCauley, D., Heffron, R., Stephan, H. and Rehner, R., 2016b. Energy justice: a conceptual review. Energy Research & Social Science, 11, pp.174-182.
- JNNSM, 2017. Solar Energy Corporation of India Limited. Retrieved from <http://www.seci.gov.in/content/innerinitiative/jnnsbm.php> (Accessed on May 4, 2018);
- Klugman, J., 2011. Human Development Report 2011. Sustainability and Equity: A better future for all.
- Kumar, A.R. and Jeyanth, K.R., 2012, March. Outburst of renewable energy in India is it towards the target?. In Advances in Engineering, Science and Management (ICAESM), 2012 International Conference on (pp. 36-41). IEEE;
- Kumar, S., Bhattacharyya, B. and Gupta, V.K., 2014. Present and Future Energy Scenario in India. Journal of The Institution of Engineers (India): Series B, 95(3), pp.247-254.

- Kuzemko, C., Lockwood, M., Mitchell, C. and Hoggett, R., 2016. Governing for sustainable energy system change: Politics, contexts and contingency. *Energy Research & Social Science*, 12, pp.96-105.
- Lafferty, W., 1996. The politics of sustainable development: global norms for national implementation. *Environmental Politics* 5, 185–208.
- Lemons, J. and Brown, D.A., 2011. Global climate change and non-violent civil disobedience. *Ethics in Science and Environmental Politics*, 11(1), pp.3-12.
- Liebenthal, A., 2011. Review of MIGA's Experience with Safeguards and Sustainability Policies (1999-2008).
- Lockwood, M., Kuzemko, C., Mitchell, C. and Hoggett, R., 2017. Historical institutionalism and the politics of sustainable energy transitions: A research agenda. *Environment and Planning C: Politics and Space*, 35(2), pp.312-333.
- Luthra, S., Kumar, S., Garg, D. and Haleem, A., 2015. Barriers to renewable/sustainable energy technologies adoption: Indian perspective. *Renewable and Sustainable Energy Reviews*, 41, pp.762-776.
- Manna U., and Phil M., 2017. Renewable energy in India: Potential, Growth and policies. Retrieved from <http://envecologic.com/?p=1240> (Accessed on May 25, 2018);
- Mathew, Jose (2003), "Development Policies of India with Special Reference to New Economic policy", Mahatma Gandhi University, Kerala.
- May, T., 2001. *Social Research: Issues, Methods and Process*. 3rd Edition. Open University Press.
- Meadowcroft J., 2005 Environmental political economy, technological transitions and the state. *New Political Economy* 10(4): 479–498.
- Meadowcroft, J., 2011. Engaging with the politics of sustainability transitions. *Environmental Innovation and Societal Transitions*, 1(1), pp.70-75.
- Mickelson, K., 2007. Critical approaches. In: Bodansky, D., Brunnee, J., Hey, E. (Eds.), *The Oxford Handbook of International Environmental Law*. OUP, Oxford, UK, 2007.
- Ministry of Environment, Forest and Climate Change, 2008. National Action Plan on climate change of GoI. Prime Minister's council on climate change. Retrieved from <http://www.moef.nic.in/downloads/home/Pg01-52.pdf> (Accessed on May 13, 2018);
- Mitchell, C., 1985. Case and Situation Analysis.
- MNRE, 2012. JNNMS. Phase II – Policy Document. Retrieved from <https://mnre.gov.in/file-manager/UserFiles/draft-jnnsmpd-2.pdf> (Accessed on April 29, 2018);

- MNRE, 2014. Gujarat Solar Park. World's first Multi developer, Multi facility, Multi Technology and Multi beneficiary solar park at Charanka Village, District Patan, Gujarat. Retrieved from <https://mnre.gov.in/file-manager/UserFiles/presentation-21102014/Solar-Parks-GPCL.pdf> (Accessed on May 14, 2018);
- MNRE, 2016. JNNSM Guidelines for Development of Solar Parks. Retrieved from <http://mnre.gov.in/file-manager/UserFiles/Solar-Park-Guidelines.pdf> (Accessed on 25.03.2018);
- Moore, N., 2000. How to do Research: The Complete guide to Designing and Managing Research Projects. 3rd Edition. Library Association Publishing.
- Morrison, M.A., Haley, E., Sheehan, K.B. and Taylor, R.E., 2011. Using qualitative research in advertising: Strategies, techniques, and applications. Sage Publications.
- Nachmias, C., 2007. Research Methods in the Social Sciences. 7th Edition. Worth Publishers.
- Ola, D., 2016. USAID sign US\$848 million MoU to develop Indian solar parks. Retrieved from <https://www.pv-tech.org/news/adb-usaid-sign-mou-to-develop-indian-solar-parks> (Accessed on April 23, 2018);
- Oxfam Australia, 2010. Understanding the Asian Development Bank's Safeguard Policy. Retrieved from <https://www.oxfam.org.au/wp-content/uploads/2011/08/oaus-adsafeguards-0610.pdf> (Accessed on May 15, 2018);
- Paliwal, R., 2006. EIA practice in India and its evaluation using SWOT analysis. Environmental impact assessment review, 26(5), pp.492-510.
- PC, 2006. Integrated Energy Policy: Report of the Expert Committee, New Delhi. Retrieved from [http://planningcommission.gov.in/reports/genrep/rep\\_intengy.pdf](http://planningcommission.gov.in/reports/genrep/rep_intengy.pdf) (Accessed on May 26, 2018);
- Pentland W., 2014. India Pushes Ultra-Mega Scheme to scale solar PV. Forbes/Energy. Retrieved from <https://www.forbes.com/sites/williampentland/2014/09/09/india-pushes-ultra-mega-scheme-to-scale-solar-pv/#358e2e384e0a> (Accessed on May 16, 2018);
- Policy, I.E., 2006. Report of the Expert Committee. Government of India, Planning Commission, New Delhi, pp.1-148.
- Prakash, B., 2016. Solar Energy Policy and Economic Development in India context to Gujarat. XVII Annual International Seminar Proceedings. p.8;
- Rasch, E.D. and Köhne, M., 2017. Practices and imaginations of energy justice in transition. A case study of the Noordoostpolder, the Netherlands. Energy Policy, 107, pp.607-614.

- Rathod, J., 2000. Charanka - Gujarat Solar Park. Retrieved from <https://natgrp.wordpress.com/charanka-gujarat-solar-park/> (Accessed on May 9, 2018);
- Rathod, J., 2012. Charanka - Gujarat Solar Park. Retrieved from <https://natgrp.wordpress.com/charanka-gujarat-solar-park/> (Accessed on May 9, 2018);
- Ritchie, J., Lewis, J., Nicholls, C.M. and Ormston, R. eds., 2013. Qualitative research practice: A guide for social science students and researchers. Sage.
- Rotmans, J., Kemp, R. and Van Asselt, M., 2001. More evolution than revolution: transition management in public policy. *foresight*, 3(1), pp.15-31.
- Sarantakos, S., 2005. Social Research. 3rd. Hampshire: Palgrave Macmillan.
- Schlosberg, D., 2013. Theorising environmental justice: the expanding sphere of a discourse. *Environmental Politics*, 22(1), pp.37-55.
- Sengupta M., 2017. Environmental Impact Assessment (EIA) Process in India. Retrieved from <http://www.pocketlawyer.com/blog/environmental-impact-assessment-india-eia-process/> (Accessed on June 3, 2018);
- Sohail S., 2018. Energy Transition. *The Global Energiewende*. India's energy transition: potential and prospects. Retrieved from <https://energytransition.org/2018/02/indias-energy-transition-potential-and-prospects/> (Accessed on May 4, 2018);
- Sovacool, B.K. and Dworkin, M.H., 2014. *Global energy justice*. Cambridge University Press.
- Sovacool, B.K. and Dworkin, M.H., 2015. Energy justice: Conceptual insights and practical applications. *Applied Energy*, 142, pp.435-444.
- Sovacool, B.K., Burke, M., Baker, L., Kotikalapudi, C.K. and Wlokas, H., 2017. New frontiers and conceptual frameworks for energy justice. *Energy Policy*, 105, pp.677-691.
- Stake, R.E., 1980. 'Generalisations'. Paper presented at the annual meeting of the American Education Research Association.
- Stirling, A., 2014. Emancipating Transformations: from controlling "the transition" to culturing to culturing plural radical progress.
- Sushma U.N. and Anand N., 2018. Cheap renewable energy is killing India's coal-based power plants. Retrieved from <https://qz.com/1272394/cheap-solar-and-wind-energy-prices-are-killing-indias-coal-power-plants/> (Accessed on May 31, 2018);
- Temper, L., Del Bene, D. and Martinez-Alier, J., 2015. Mapping the frontiers and front lines of global environmental justice: the EJAtlas. *Journal of Political Ecology*, 22(1), pp.255-278.



- The Shift Project Data Portal, 2018. Browse Energy and Climate Data. Breakdown of Electricity Generation by Energy Source. Retrieved from <https://www.adb.org/sites/default/files/institutional-document/31483/om-f1-20131001.pdf> (Accessed on June 1, 2018);
- Ummadisingu, A. and Soni, M.S., 2011. Concentrating solar power–technology, potential and policy in India. *Renewable and Sustainable Energy Reviews*, 15(9), pp.5169-5175.
- UN in India, 2018. SDG 7: Affordable and Clean Energy. Retrieved from <http://in.one.un.org/page/sustainable-development-goals/sdg-7/> (Accessed on May 31, 2018);
- UNDP, 2018. Sustainable development goals. <http://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-7-affordable-and-clean-energy.html> (Accessed on 07 March 2018);
- Warren, C.R. and McFadyen, M., 2010. Does community ownership affect public attitudes to wind energy? A case study from south-west Scotland. *Land use policy*, 27(2), pp.204-213.
- Water India, 2006. India Country Case Study. Water for All? Implementation of ADB's water policy in India: A review;
- WaterAid, 2007. The true cost of concessional loans: On-lending practices at the Asian Development Bank. Retrieved from <http://eurodad.org/uploadedfiles/members/adb%20on-lending%20discussion%20paper%20-%20may%202007.pdf> (Accessed on April 23, 2018);
- WB, 2016. Access to electricity (% of population). Retrieved from <https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS> (Accessed on May 27, 2018);
- Wiskerke, J.S.C. and van der Ploeg, J.D. eds., 2004. *Seeds of transition: essays on novelty production, niches and regimes in agriculture*. Uitgeverij Van Gorcum.
- World Bank, 2013. Energy Sector Management Assistance Program (ESMAP). *Paving the way for a Transformational Future: Lessons from JNNM Phase I*. Retrieved from <https://openknowledge.worldbank.org/bitstream/handle/10986/17480/832660REPLACEMENT00ESM0ESMAP00PUBLIC0.pdf;sequence=1> (Accessed on May 13, 2018);
- World Bank, 2017. Overview State of Electricity Access Report. Washington DC. Retrieved from <http://documents.worldbank.org/curated/en/285651494340762694/pdf/114841-ESM-PUBLIC-P148200-32p-FINALSEAROverviewWEB.pdf> (Accessed April 29, 2018);



- World Commission on Dams, 2000. Dams and Development: A New Framework for Decision-making: the Report of the World Commission on Dams. Earthscan.
- Yenneti, K. and Day, R., 2015. Procedural (in) justice in the implementation of solar energy: The case of Charanaka solar park, Gujarat, India. *Energy Policy*, 86, pp.664-673;
- Yenneti, K. and Day, R., 2016. Distributional justice in solar energy implementation in India: the case of Charanka solar park. *Journal of rural studies*, 46, pp.35-46;
- Yenneti, K., Day, R. and Golubchikov, O., 2016. Spatial justice and the land politics of renewables: Dispossession of vulnerable communities through solar energy mega-projects. *Geoforum*, 76, pp.90-99.
- Yin, R.K., 2014. Case study research: Design and methods, Fifth Edition. ed. Sage Publications, Inc., Thousand Oaks, CA.

## APPENDICES

### Appendix I: Sample ADB representative / Project Developer / Government of India Representative / Solar Energy Policy Consultant Interview Schedule

EJ principles <sup>7</sup>	ADB representatives	Solar Energy Policy Consultants	GETCO (GoI) Representatives
(Respondent's expertise)	What is your occupation? What is your relation to (Charanka) solar park?		
Good Governance (Transparency & Accountability)	What organizations financed the Charanka solar park? What organizations were involved in the project design, development and implementation? Whose (stakeholders) interests are mainly considered in the project implementation? Why? How are the communication between different stakeholders arranged? Who (stakeholders) had more influence in decision-making processes? How conflicts, if any, with stakeholders were addressed? How the powers and responsibilities within the project implementation framework was divided?		
	What was the role of the ADB in the project?		
Location selection criteria	Based on what criteria project location was chosen?		
	What was/is the population's major source of income?		
Project challenges and mitigation measures	What were the challenges confronted during the project development and implementation? What measures were taken to mitigate those challenges?		
Procedural & Recognitional Justice (public awareness & participation)	Has GoI or ADB established public awareness or public meetings about the project with targeted communities? How often those public meetings were held before/during/after the project?		
	How ADB encouraged public participation (including all castes) in the project? How about the public participation in the project decision-making process?	What was the social acceptance of the project among the targeted communities?	How GoI encouraged public participation (including all castes) in the project? How about the public participation in the project decision-making process?
Distributional Justice: Project benefits & burdens	What were the project benefits and burdens for the targeted communities?		What are the project benefits and burdens?

<sup>7</sup> EJ principles column is based on EJ conceptual framework presented in Table 2.3.1.

Environment, health and safety; Due Process; Responsibility	Have studies such as EIA and ESIA studies evaluating the impact of the project conducted?	
Distributional Justice; Land acquisition & compensation, Redress mechanisms; Due Process	Was ADB involved in the land acquisition & compensation process? Has ADB monitored the process of redress in accordance with the ADB safeguards?	How the land acquisition and compensation process took place? What was the targeted communities' reaction to the project and the land acquisition?
Affordability	Who sets the electricity price for the rural communities?	
Energy affordability & availability	Are energy services affordable to poor households?	
Improved infrastructure	Has the infrastructure improved?	
Employment opportunities & Capacity building; Intersectionality	Upon project completion, any job opportunities were established? Training or new skills to improve their livelihood?	
Overall project reflection, lessons learned	How would be your reflection on the overall achievement of the project? (positive/negative) Why? When looking back are there any things that you would have done differently?	

Source: Questions were adapted by the Author based on ADB, 1994 & 2012; GIEK, 2010; WCD, 2000; Liebenenthal, 2011

## **Appendix II: Sample ADB watchdog NGO Interview Schedule**

(source: questions were adapted by the author based on ADB, 1994 & 2012; GIEK, 2010; WCD, 2000; Liebenthal, 2011)

- 1) What is your relation to the ADB?
- 2) What is the ADB project implementation cycle?
- 3) If there is a public resistance to the project, how the ADB addresses it?
- 4) How do you observe public resistance to the ADB projects? (Social Media e.g. internet, newspapers, blogs, radio, etc.)
- 5) How Gol or ADB establish public awareness or public meetings about its projects?
- 6) How ADB encourages public participation in projects?
- 7) Are energy services and sources affordable, particularly to poor households?
- 8) What is the ADB's involvement in the land acquisition and compensation process?
- 9) How ADB addresses the resettlement and rehabilitation issues?
- 10) What organizations (state authorities, private companies, etc) were involved in the project design, development and implementation?
- 11) Whose (stakeholders) interests are mainly considered in such projects? Why?
- 12) What would be your reflection on the overall ADB's role (positive/negative)? Why?
- 13) When looking back is there anything that you would advise the ADB or the Gol to implement the project differently? Why?

### Appendix III: List of Interviewees

(Sources: Autor)

#	Name of Organization	Position/ Department	Respondents reference	Interview type	Date	Interview duration
1	ADB representative, India Resident Mission	Energy, Policy Making & Implementation	Respondent #1	Semi-structured interview	24.04.2018	00:17:00
2	GETCO, State Load Dispatch Center	Energy expert (project implementer)	Respondent #2	Questionnaires (refused to the interview)	02.05.2018	N/A
3	GETCO	Implementer	Respondent #3	Questionnaires (refused to the interview)	23.04.2018	N/A
4	Project Developer, Cirus Solar Systems PVT	Project Manager on Charanka project	Respondent #4	Semi-structured interview	19.04.2018	00:23:23
5	Project Developer, Yantra e Solar India Pvt Ltd	Project Manager on Charanka project	Respondent #5	Semi-structured interview	17.04.2018	00:14:00
6	Energy Consultancy	National consultant on Renewable energy	Respondent #6	Semi-structured interview	19.04.2018	00:30:27
7	ADB watchdog NGO	ADB policy expert	Respondent #7	Semi-structured interview	10.05.2018	00:56:25
8	Scholar on solar power policies and social justice matters	Researcher on Charanka/Indian solar power parks	Respondent #8	Semi-structured interview	19.05.2018	00:29:57

## Appendix IV: Documents and Data Analyzed (Sources: Autor)

Documents selected	Data analyzed
<a href="https://www.adb.org/news/history-book-marking-50-years-adb-launched-india">ADB, 2018a. History Book Marking 50 Years of ADB Launched in India. Retrieved from https://www.adb.org/news/history-book-marking-50-years-adb-launched-india</a> (Accessed on April 23, 2018);	The ADB and India: country partnership strategies
<a href="https://www.adb.org/about/main">ADB, 2018. Who we are. Retrieved from https://www.adb.org/about/main</a> (Accessed on April 23, 2018);	ADB's mission statement and its main strategies
<a href="https://www.adb.org/countries/india/main">ADB, 2018. India and ADB. Retrieved from https://www.adb.org/countries/india/main</a> (Accessed on 26.03.2018).	ADB's mission in India. Country partnership strategy for the solar development
<a href="https://www.adb.org/projects/documents/ind-44431-013-esmr-1">ADB, 2017. Social and Environmental Monitoring Report. Retrieved from https://www.adb.org/projects/documents/ind-44431-013-esmr-1</a> (Accessed on May 15, 2018)	Charanka project: Social and Environmental Impact; EJ principles analysis
<a href="https://www.adb.org/projects/documents/gujarat-solar-power-transmission-project-1">ADB, 2016. Initial Environmental Examination. Retrieved from https://www.adb.org/projects/documents/gujarat-solar-power-transmission-project-1</a> (Accessed on May 10, 2018)	Charanka project's Initial Environmental Examination. Project's Environmental and social impact in 2016, ADB's safeguard policy compliance.
<a href="http://kspddl.in/sp_docs/Environment%20Assesment%20impact%20report%20Feb-16.pdf">Knight Frank 2016. EIA-Solar PV park. Retrieved from http://kspddl.in/sp_docs/Environment%20Assesment%20impact%20report%20Feb-16.pdf</a> (Accessed on April 29, 2018)	Solar project implementation in India and important policies on solar energy
<a href="https://www.adb.org/news/adb-usaid-collaborate-developing-clean-energy-infrastructure-india">ADB, 2016 a. ADB, USAID to Collaborate on Developing Clean Energy Infrastructure in India. Retrieved from https://www.adb.org/news/adb-usaid-collaborate-developing-clean-energy-infrastructure-india</a> (Accessed on April 23, 2018);	USAID's support to the Gujarat and Rajasthan solar power plant projects.
<a href="http://www.gseb.com/DownloadFiles/File/GUVNL/Gujarat%20Solar%20Power%20Policy%202015.pdf">GoG, 2015. Gujarat Solar Power Policy 2015. Retrieved from http://www.gseb.com/DownloadFiles/File/GUVNL/Gujarat%20Solar%20Power%20Policy%202015.pdf</a> (Accessed on May 08, 2018)	Key points of Gujarat solar power policy 2015.
<a href="https://www.adb.org/documents/safeguards-operational-review-adb-processes-portfolio-country-systems-and-financial-interm">ADB, 2014. Chair's summary of the development Effectiveness Committee. Retrieved from https://www.adb.org/documents/safeguards-operational-review-adb-processes-portfolio-country-systems-and-financial-interm</a> (Accessed on May 14, 2018)	ADB's safeguard policies implementation in regard to the EJ analysis
<a href="https://www.adb.org/documents/safeguards-operational-review-adb-processes-portfolio-country-systems-and-financial-interm">ADB, 2014. Safeguards Operational Review. ADB Process, Portfolio, Country systems and Financial Intermediaries. Retrieved from https://www.adb.org/documents/safeguards-operational-review-adb-processes-portfolio-country-systems-and-financial-interm</a> (Accessed on May 09, 2018)	ADB's safeguard policies implementation in regard to the EJ analysis
<a href="https://www.adb.org/documents/safeguards-operational-review-adb-processes-portfolio-country-systems-and-financial-interm">ADB, 2014. Management response to IED report: corporate evaluation study on safeguards operational review- ADB processes, portfolio, and financial intermediaries. Retrieved from https://www.adb.org/documents/safeguards-operational-review-adb-processes-portfolio-country-systems-and-financial-interm</a> (Accessed on May 14, 2018)	ADB's assessment of its safeguard requirements and measures to improve project compliance with safeguard requirements

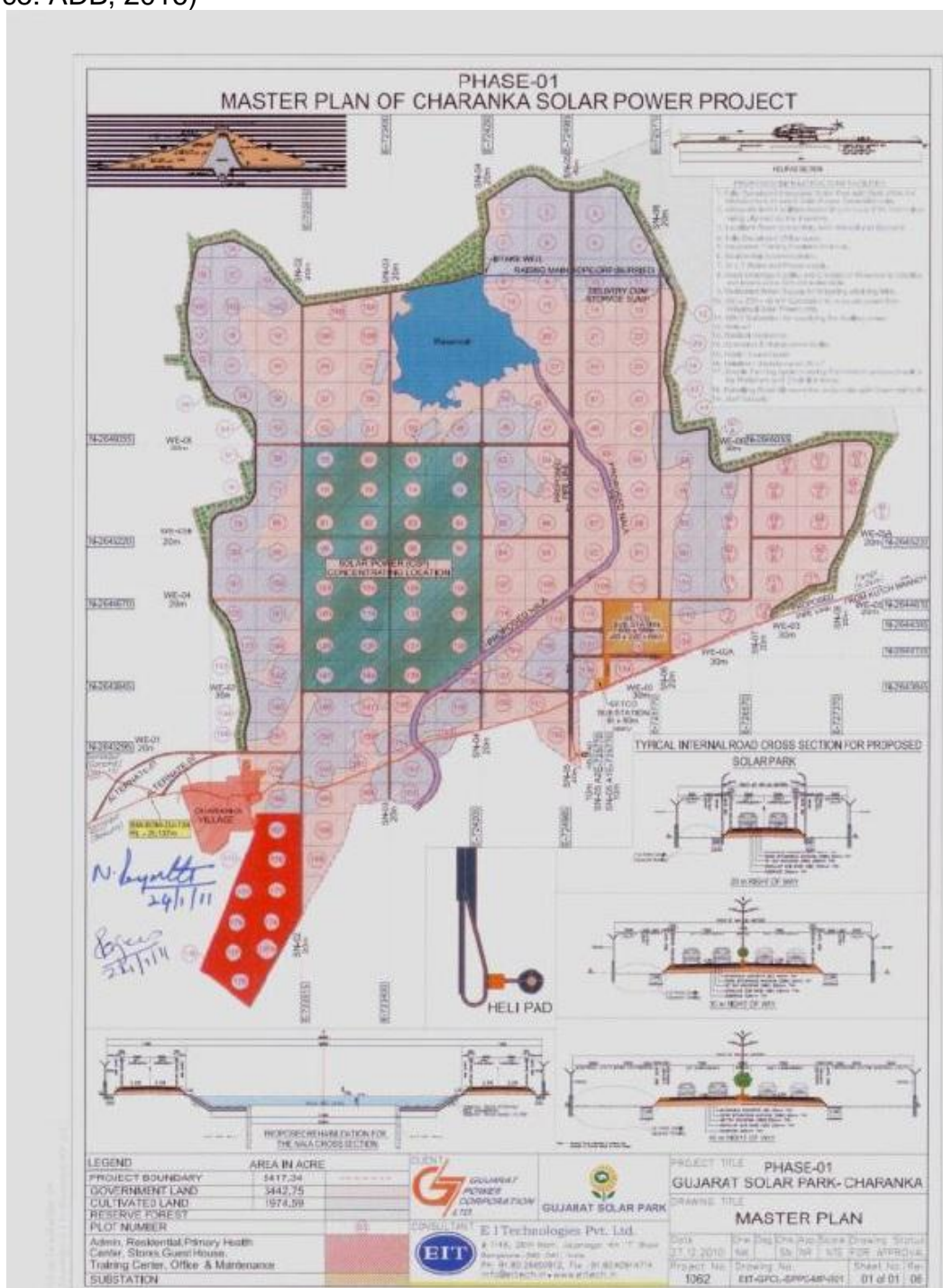
<a href="https://www.climateinvestmentfunds.org/sites/default/files/Draft%20RRP%20-%20Reviewed%2025%20June%20submission_JA.pdf">ADB, 2013. Draft report and recommendation of the president to the board of directors. Proposed multi-tranche financing facility and technical assistance grant and administration of loan. India: Rajasthan renewable energy transmission investment program. Retrieved from https://www.climateinvestmentfunds.org/sites/default/files/Draft%20RRP%20-%20Reviewed%2025%20June%20submission_JA.pdf</a> (Accessed on May 9, 2018)	Similar projects to (Charanka) Gujarat solar power plant projects.
<a href="https://www.adb.org/publications/thorough-planning-solar-park-mitigates-risk-investors-locals">ADB Knowledge Showcases, 2013. Thorough Planning of Solar Park Mitigates Risk for Investors, Locals. Retrieved from https://www.adb.org/publications/thorough-planning-solar-park-mitigates-risk-investors-locals</a> (Accessed on May 1, 2018)	Charanka project details and energy capacity details
<a href="https://www.adb.org/sites/default/files/project-document/61518/44941-01-ind-sa.pdf">ADB, 2011. Key Terms and Conditions for the India Solar Power Generation Guarantee Facility (Guarantee Facility). Retrieved from https://www.adb.org/sites/default/files/project-document/61518/44941-01-ind-sa.pdf</a> (Accessed on 06.04.2018);	ADB and India: terms and conditions for Indian Solar power plant projects
<a href="https://www.adb.org/sites/default/files/project-document/61201/44431-013-ind-pam.pdf">ADB &amp; GETCO, 2011. Project Administration Manual. India: Gujarat Solar Power Transmission Project. Retrieved from https://www.adb.org/sites/default/files/project-document/61201/44431-013-ind-pam.pdf</a> (Accessed May 15, 2018)	Charanka solar power plant project's (administrative) implementation. The project design, stakeholders involved, decision-making process, resettlement plan, Project's Environmental and social impact, ADB's safeguard policy compliance.
<a href="https://www.adb.org/projects/documents/gujarat-solar-power-transmission-project-3">ADB, 2011. Resettlement Plan. Retrieved from https://www.adb.org/projects/documents/gujarat-solar-power-transmission-project-3</a> (Accessed on May 10, 2018)	ADB: Charanka project's Resettlement Plan
<a href="https://www.adb.org/projects/documents/gujarat-solar-power-transmission-project-1">ADB, 2011. Initial Environmental Examination. Retrieved from https://www.adb.org/projects/documents/gujarat-solar-power-transmission-project-1</a> (Accessed on May 9, 2018)	Charanka project's Initial Environmental Examination. Project's Environmental and social impact in 2011, ADB's safeguard policy compliance.
<a href="https://www.adb.org/documents/pcp-2011">ADB, 2011. Public Communications Policy 2011. Retrieved from https://www.adb.org/documents/pcp-2011</a> (Accessed on May 10, 2018)	ADB's policies on Public participation in project design and implementation. Better implementation of Safeguard requirements
<a href="https://www.adb.org/sites/default/files/publication/29545/sa-project-brief-ind-gujarat-power-transmission.pdf">South Asia Project Brief, 2011. Gujarat Solar Power Transmission Project. Retrieved from https://www.adb.org/sites/default/files/publication/29545/sa-project-brief-ind-gujarat-power-transmission.pdf</a> (Accessed on May 1, 2018)	Charanka project details and energy capacity details
<a href="https://www.adb.org/documents/energy-policy">ADB, 2009. Energy Policy. Retrieved from https://www.adb.org/documents/energy-policy</a> (Accessed on April 23, 2018);	ADB's Energy policy (2009); support in the EJ principles analysis.
<a href="https://www.adb.org/sites/default/files/institutional-document/33441/files/policy-indigenous-peoples.pdf">ADB, 1998. The Bank's policy on indigenous peoples. Retrieved from https://www.adb.org/sites/default/files/institutional-document/33441/files/policy-indigenous-peoples.pdf</a> (Accessed on May 14, 2018)	ADB's policy on the indigenous peoples; its application to the Charanka solar project.
<a href="https://www.adb.org/sites/default/files/linked-documents/cps-ind-2013-2017-ssa-01.pdf">ADB, Country Partnership Strategy: IND, 2013-2017. Sector Assessment (summary): Energy. Retrieved from https://www.adb.org/sites/default/files/linked-documents/cps-ind-2013-2017-ssa-01.pdf</a> (Accessed on May 14, 2018)	ADB and India: country partnership strategy on solar energy projects.
<a href="https://mnre.gov.in/file-manager/UserFiles/draft-innsmpd-2.pdf">Ministry of New and Renewable Energy (MNRE), 2012. JNNMS. Phase II – Policy Document. Retrieved from https://mnre.gov.in/file-manager/UserFiles/draft-innsmpd-2.pdf</a> (Access April 29, 2018);	JNNMS mission. List of targets for its Phases (Chapter 4)
<a href="https://mnre.gov.in/file-manager/UserFiles/presentation-21102014/Solar-Parks-GPCL.pdf">MNRE, 2014. Gujarat Solar Park. World's first Multi developer, Multi facility, Multi Technology and Multi beneficiary solar park at Charanka Village, District Patan, Gujarat. Retrieved from https://mnre.gov.in/file-manager/UserFiles/presentation-21102014/Solar-Parks-GPCL.pdf</a> (Accessed on May 14, 2018);	Gujarat Solar Park project's challenges and infrastructural improvements that used for EJ principle analysis (Chapter 5)

<a href="http://mnre.gov.in/file-manager/UserFiles/Solar-Park-Guidelines.pdf">MNRE, 2016. JNNMS Guidelines for Development of Solar Parks. Retrieved from http://mnre.gov.in/file-manager/UserFiles/Solar-Park-Guidelines.pdf</a> (Accessed on 25.03.2018)	JNNMS policy details used in (Chapters 4-5) for Policy Analysis. Indian Energy Development timeline table.
<a href="http://www.moef.nic.in/downloads/home/Pg01-52.pdf">Ministry of Environment, Forest and Climate Change, 2008. National Action Plan on climate change of Gol. Prime Minister's council on climate change. Retrieved from http://www.moef.nic.in/downloads/home/Pg01-52.pdf</a> (Accessed on May 13, 2018)	India's regulations and measures towards to the Climate Change. India's Sustainable Energy Transition
<a href="https://www.iea.org/publications/freepublications/publication/India_study_FINAL_WEB.pdf">International Energy Agency (IEA), 2012. Partner Country series. Understanding Energy Challenges in India: Policy, Players and Issues. IEA, France. Retrieved from https://www.iea.org/publications/freepublications/publication/India_study_FINAL_WEB.pdf</a> (Accessed April 29, 2018);	Institutional structure of energy administration in India (Chapter 4); Data on the organization chart of the Government of India and how the energy system is organized. Indian Energy Development timeline table
<a href="https://www.iea.org/publications/freepublications/publication/IndiaEnergyOutlook_WEO2015.pdf">IEA, 2015. India Energy Outlook. Retrieved from https://www.iea.org/publications/freepublications/publication/IndiaEnergyOutlook_WEO2015.pdf</a> (Accessed on April 29, 2018)	Data on the main Indian solar policies and regulations (Chapter 4) that were analyzed within the EJ' 10 principles (Chapter 5). Indian Energy Development timeline table
<a href="https://www.bp.com/content/dam/bp-country/de_ch/PDF/bp-statistical-review-of-world-energy-2017-full-report.pdf">BP Statistical Review of World Energy, 2017. Retrieved from https://www.bp.com/content/dam/bp-country/de_ch/PDF/bp-statistical-review-of-world-energy-2017-full-report.pdf</a> (Accessed on May 3, 2018);	BP Statistical review on the World and Indian Energy. India's growth in energy consumption. Indian trend into the renewable energy transition.
<a href="http://documents.worldbank.org/curated/en/285651494340762694/pdf/114841-ESM-PUBLIC-P148200-32p-FINALSEAROverviewWEB.pdf">World Bank, 2017. Overview State of Electricity Access Report. Washington DC. Retrieved from http://documents.worldbank.org/curated/en/285651494340762694/pdf/114841-ESM-PUBLIC-P148200-32p-FINALSEAROverviewWEB.pdf</a> (Accessed April 29, 2018);	UN's SDGs (#7) in Indian context. India's national policies on grids
<a href="https://openknowledge.worldbank.org/bitstream/handle/10986/17480/8/32660REPLACEM0X0ESM0ESMAP00PUBLIC0.pdf;sequence=1">World Bank, 2013. Energy Sector Management Assistance Program (ESMAP). Paving the way for a Transformational Future: Lessons from JNNMS Phase I. Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/17480/8/32660REPLACEM0X0ESM0ESMAP00PUBLIC0.pdf;sequence=1</a> (Accessed on May 13, 2018)	JNNMS mission. List of targets for its Phases (Chapter 4). Analysis in EJ's 10 principles (Chapter 5).
<a href="http://eurodad.org/uploadedfiles/members/adb%20on-lending%20discussion%20paper%20-%20may%202007.pdf">WaterAid, 2007. The true cost of concessional loans: On-lending practices at the Asian Development Bank. Retrieved from http://eurodad.org/uploadedfiles/members/adb%20on-lending%20discussion%20paper%20-%20may%202007.pdf</a> (Accessed on April 23, 2018);	ADB's lending practices, its complications, terms and conditions (Chapter 5).



Media documents selected	Data analysed
<a href="https://energytransition.org/2018/02/indias-energy-transition-potential-and-prospects/">Sohail S., 2018. Energy Transition. The Global Energiewende. India's energy transition: potential and prospects. Retrieved from https://energytransition.org/2018/02/indias-energy-transition-potential-and-prospects/ (Accessed on May 4, 2018);</a>	India's energy transition: potential and prospects. India's commitment to UNFCCC.
<a href="http://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-7-affordable-and-clean-energy.html">UNDP, 2018. Sustainable development goals. http://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-7-affordable-and-clean-energy.html (Accessed on 07 March 2018).</a>	UN's SDGs: #7 - affordable and clean energy goals arching with the ADB's mission.
<a href="http://theconversation.com/to-slow-climate-change-india-joins-the-renewable-energy-revolution-78321">Agrawal, A., 2017. To slow climate change, India joins the renewable energy revolution. Retrieved from http://theconversation.com/to-slow-climate-change-india-joins-the-renewable-energy-revolution-78321 (Accessed on May 13, 2018)</a>	Cost of electricity from the solar power plant's generation (Chapter 5).
<a href="https://www.livemint.com/Politics/QW4cJ9yjhmvUtOZCPyOt3J/Govt-eases-environment-clearance-rules-for-solar-projects.html">Aggarwal, M., 2017. Government eases environmental clearance rules for solar power projects, parks. Retrieved from https://www.livemint.com/Politics/QW4cJ9yjhmvUtOZCPyOt3J/Govt-eases-environment-clearance-rules-for-solar-projects.html (Accessed on May 13, 2018);</a>	Indian ministries eased the EIA requirements to the Solar power plants, used in the EJ's analysis part (Chapter 5).
<a href="https://www.forbes.com/sites/williampentland/2014/09/09/india-pushes-ultra-mega-scheme-to-scale-solar-pv/#358e2e384e0a">Pentland W., 2014. India Pushes Ultra-Mega Scheme to scale solar PV. Forbes/Energy. Retrieved from https://www.forbes.com/sites/williampentland/2014/09/09/india-pushes-ultra-mega-scheme-to-scale-solar-pv/#358e2e384e0a (Accessed on May 16, 2018)</a>	India's reinforcing its capacity towards to the renewables (Solar); from mega project to ultra-mega solar projects.
<a href="https://natgrp.wordpress.com/charanka-gujarat-solar-park/">Rathod, J., 2000. Charanka - Gujarat Solar Park. Retrieved from https://natgrp.wordpress.com/charanka-gujarat-solar-park/ (Accessed on May 9, 2018);</a>	Charanka project as a success story to apply in the next solar projects in India. Speech of Modi in project inauguration (public meeting)
<a href="https://www.asiabiomass.jp/english/topics/1403_05.html">Asia Biomass Office, 2014. Construction of the Largest Solar Park in Asia is Underway in India. Retrieved from https://www.asiabiomass.jp/english/topics/1403_05.html (Accessed on May 4, 2018);</a>	Impact of the JNNSM on Charanka solar power projects.
<a href="http://www.thecivilindia.com/thecivilindia/pages/governance/country.html">Governance &amp; Administration, 2018. The Civil India. Retrieved from http://www.thecivilindia.com/thecivilindia/pages/governance/country.html (Accessed on May 4, 2018);</a>	Indian administrative divisions from Central Government towards (village municipality) used in Chapter 4
<a href="http://www.seci.gov.in/content/innerinitiative/jnnsm.php">JNNSM, 2017. Solar Energy Corporation of Indian Limited. Retrieved from http://www.seci.gov.in/content/innerinitiative/jnnsm.php (Accessed on May 4, 2018);</a>	JNNMS mission. List of targets for its Phases (Chapter 4). Analysis in EJ's 10 principles (Chapter 5). Indian Energy Development timeline table.
<a href="https://www.pv-tech.org/news/adb-usaid-sign-mou-to-develop-indian-solar-parks">Ola, D., 2016. USAID sign US\$848 million MoU to develop Indian solar parks. Retrieved from https://www.pv-tech.org/news/adb-usaid-sign-mou-to-develop-indian-solar-parks (Accessed on April 23, 2018);</a>	Support from International Development Agencies to promote and finance Indian Solar power plant projects.

**Appendix V: Charanka Solar Power Park Phase I Master Plan**  
(source: ADB, 2016)



**Appendix VI: Pictures of Charanka Solar Power Park**  
Source: Gujarat Energy Development Agency

