



Indian Institute of  
Technology Delhi



THE UNIVERSITY  
OF QUEENSLAND  
AUSTRALIA

EXAMINING SOCIAL ACCEPTANCE OF LARGE-  
SCALE SOLAR PROJECTS IN INDIA

*by*

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**INDIAN INSTITUTE OF TECHNOLOGY DELHI**

**&**

**THE UNIVERSITY OF QUEENSLAND**

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Examining Social Acceptance of Large-Scale Solar Projects in India

*by*

**Simran Agarwal**

B.A, M.A

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in fulfilment of the requirements for the joint degree of

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**&**

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*Dedicated to all first-generation female scholars. None of us would have had an easy journey, I am so glad we made it.*

*You may say I am a dreamer, but I am not the only one- John Lennon*

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### *Supervisor Certification*

This is to certify that the thesis entitled “ **Examining Social Acceptance of Large-Scale Solar Projects in India**” being submitted by **Ms. Simran Agarwal** to the Indian Institute of Technology Delhi and The University of Queensland for the award of degree of **Doctor of Philosophy** is a record of *bonafide* research work carried out by her. **Ms. Simran Agarwal** has worked under our guidance and supervision and has fulfilled the requirements for the submission of this thesis, which to our knowledge has reached the requisite standard. The results contained in this thesis are original and have not been submitted, in part or full, to any other University or Institute for the award of any other degree or diploma.

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## Abstract

This thesis studies social acceptance of large-scale solar projects by using principles of social justice. Three major stakeholders in the current energy transition- the community; the market (end consumers of energy); the state and the civil society provide various point of departure in studying the key debate around sustainability of the renewable energy transition. Each of these stakeholders form the focus of analysis in one of the studies conducted for the thesis thus providing a holistic understanding of the justice implications through different perspectives. The research applies principles of procedural justice (Burningham et al., 2006; Cass & Walker, 2009) distributional justice (Cowell et al., 2011; Brady & Monani, 2012) and recognition justice (Gross 2007; Walker & Day, 2012) to study the implementation of large-scale solar infrastructures. The thesis is also a step in the direction of providing an integrated understanding of the social, economic and political dynamics of the transition. It bridges the gap between distinct strands of literature on transition and justice, by studying concerns of social justice integrated with the concerns of the environment. By providing a deeper insight into the dynamics of India's solar transition, the research unpacks the dynamics of policy that promotes the development of large-scale centralised solar uptake and the implications of the model for a sizeable majority of the population that face socio-economic vulnerability. Adopting a mix of quantitative and qualitative research methods, this research provides important academic and policy contribution towards highlighting justice concern in renewable energy transition and providing recommendations for its remediation.

## Abstract in Hindi

यह थीसिस सामाजिक न्याय के सिद्धांतों का उपयोग करके बड़े पैमाने पर सौर परियोजनाओं की सामाजिक स्वीकृति का अध्ययन करती है। वर्तमान ऊर्जा परिवर्तन में तीन प्रमुख हितधारक- समुदाय; बाजार (ऊर्जा के अंतिम उपभोक्ता); अक्षय ऊर्जा संक्रमण की स्थिरता के आसपास प्रमुख बहस का अध्ययन करने में राज्य और नागरिक समाज विभिन्न प्रस्थान बिंदु प्रदान करते हैं। इनमें से प्रत्येक हितधारक थीसिस के लिए किए गए अध्ययनों में से एक में विश्लेषण का ध्यान केंद्रित करता है और इस प्रकार विभिन्न दृष्टिकोणों के माध्यम से न्याय के निहितार्थों की समग्र समझ प्रदान करता है। अनुसंधान प्रक्रियात्मक न्याय (बर्निघम एट अल।, 2006; कैस एंड वॉकर, 2009) वितरणात्मक न्याय (काउल एट अल।, 2011; ब्रैडी एंड मोनानी, 2012) और मान्यता न्याय (सकल 2007; वॉकर एंड डे, 2012) के सिद्धांतों को लागू करता है। बड़े पैमाने पर सौर अवसंरचना के कार्यान्वयन का अध्ययन करने के लिए। थीसिस संक्रमण के सामाजिक, आर्थिक और राजनीतिक गतिशीलता की एक एकीकृत समझ प्रदान करने की दिशा में भी एक कदम है। यह पर्यावरण की चिंताओं के साथ एकीकृत सामाजिक न्याय की चिंताओं का अध्ययन करके, संक्रमण और न्याय पर साहित्य के अलग-अलग पहलुओं के बीच की खाई को पाटता है। भारत के सौर परिवर्तन की गतिशीलता में गहरी अंतर्दृष्टि प्रदान करके, अनुसंधान नीति की गतिशीलता को खोलती है जो बड़े पैमाने पर केंद्रीकृत सौर ऊर्जा के विकास को बढ़ावा देती है और सामाजिक-आर्थिक भेद्यता का सामना करने वाली आबादी के एक बड़े हिस्से के लिए मॉडल के प्रभाव को बढ़ावा देती है। मात्रात्मक और गुणात्मक अनुसंधान विधियों के मिश्रण को अपनाते हुए, यह शोध प्रदान करता है अक्षय ऊर्जा संक्रमण में न्याय की चिंता को उजागर करने और इसके उपचार के लिए सिफारिशें प्रदान करने की दिशा में महत्वपूर्ण शैक्षणिक और नीतिगत योगदान।

## **Declaration by author**

This thesis is composed of my original work, and contains no material previously published or written by another person except where due reference has been made in the text. I have clearly stated the contribution by others to jointly authored works that I have included in my thesis.

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### **Publications included in this thesis**

No Publications included

### **Contributions by others to the thesis**

#### *All chapters*

Editorial suggestions were provided by the candidate's supervisors, Prof. Upasna Sharma; Dr Vigya Sharma; Prof Paul Lant; and PhD committee, Prof. Ambuj Sagar; Prof. Ankush Agarwal, Dr Tony Heynen.

### **Statement of parts of the thesis submitted to qualify for the award of another degree**

No works submitted towards another degree have been included in this thesis.

### **Research involving human or animal subjects**

All human subjects involved in this research formally consented to participate in the study.

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[social acceptance, social justice, renewable energy transition, justice in transition, solar policy, institutions, green electricity, energy policy, community acceptance]

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FoR code: 9603: Environmental and Natural Resource Evaluation, 30%

FoR code: 1402: Applied Economics, 20%]

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## **List of Abbreviations**

AC- Awareness of Consequences  
ADB- Asian Development Bank  
AEML- Adani Electricity Mumbai Ltd  
AR- Ascription of Responsibility  
AREPRL- Adani Renewable Energy Park Rajasthan Ltd  
CEA- Central Electricity Authority  
CEA- Central Electricity Authority  
CEEW- Council of Energy, Environment and Water  
CIF- Climate Investment Fund  
CIF- Climate Investment Fund  
CPR- Centre for Policy Research  
CSIS- Centre for Strategic and International Studies  
CSP- Concentrating Solar Plant  
CSR- Corporate Social Responsibility  
CTF- Clean Technology Fund  
Discoms- Distribution Companies  
DMF- District Mineral Foundation  
EIA- Energy Information Administration  
EIA- Environmental Impact Assessment  
EJAtlas- Environmental Justice Atlas  
EPA- United States Environmental Protection Agency  
ESIA- Environmental and Social Impact Assessment  
FiT- Feed-in-Tariff  
GDP- Gross Domestic Product  
GoI- Government of India  
GSDP- Gross State Domestic Product  
GW- Gigawatt  
ICAR- Indian Council of Agricultural Research  
IEA- International Energy Association  
IIA- Independence of Irrelevant Alternatives  
IJTC- India Just Transition Centre  
INR- Indian National Rupee  
IPCC- Intergovernmental Panel on Climate Change  
IRENA- International Renewable Energy Agency  
JNNSM- Jawaharlal Nehru National Solar Mission  
kWh- kilowatt-hour

LADA- Local Area Development Authority  
MLP Multi-Level Perspective  
MNRE- Ministry of New and Renewable Energy  
MRE-Marine Renewable Energy  
MU- Marginal Utility  
MW- Megawatt  
NAT- Norm Activation Theory  
NDC- Nationally Determined Contribution  
NEP- National Electricity Policy  
NGO- Non-Government Organisation  
NIMBY- Not-in-my-Backyard  
NSDP- Net State Domestic Product  
NSSO- National Sample Survey Organisation  
NTPC- National Thermal Power Corporation  
OBC- Other Backward Castes  
PIB- Press Information Bureau  
PLPCs- Public Land Protection Cells  
PPA- Power Purchase Agreements  
PRISMA- Preferred Reporting Items for Systematic Reviews and Meta-Analyses  
PV- Photovoltaics  
RET- Renewable Energy Technology  
RPO- Renewable Purchase Obligation  
RRECL- Rajasthan Renewable Energy Corporation Limited  
RSDCL- Rajasthan Solar Park Development Company Limited  
RSP- Rajasthan Solar Policy  
Saubhagya- Pradhan Mantri Sahaj Bijli Har Ghar Yojana  
SC- Schedule Castes  
SDG- Sustainable Development Goal  
SECI- Solar Energy Corporation of India  
SEZ- Special Economic Zones  
SIA- Social Impact Assessment  
SLO- Social License to Operate  
SPPD- Solar Power Park Developer  
ST- Schedule Tribes  
SUCRL- Surya Urja Company of Rajasthan Ltd.  
TERI- The Energy and Resource Institute  
UNECE- United Nations Economic Commission for Europe  
UNFCCC- United Nations Framework Convention on Climate Change

WEF- World Economic Forum  
WRI- World Resource Institute  
WTP- Willingness to Pay

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