Wuppertal Institute for Climate, Environment and Energy

GERMANWATCH

Social CSP

Energy and development: exploring the local livelihood dimension of the Noor$_o$ I CSP project in Southern Morocco

Final report

to the German Federal Ministry for Economic Cooperation and Development (BMZ)

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Executive summary

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Executive summary

In this study the *Wuppertal Institute* and *Germanwatch* analyzed and assessed the livelihood dimension of Concentrating Solar Power (CSP) technology in the MENA (Middle East and North Africa) region based on a case study conducted on the 160 MW pilot CSP plant Noor$_o$ I in Ouarzazate, Morocco. The research was supported by the German *Bonn International Center for Conversion (BICC)*, the Moroccan research and consultancy institute *MENA Renewables and Sustainability (MENARES)* , the Moroccan *Association Draa pour les Énergies Renouvelables*, the Egyptian consultancy *ETHRAA,* as well as a team of independent researchers from Morocco, Egypt, Germany, and the United States.

Objectives

Two main objectives were pursued to develop answers to the following research question:

"*What are the positive and negative livelihood impacts at the local level stemming or anticipated from CSP projects, and how can livelihood co-benefits be maximized to achieve sustainable development in adjacent communities?*"

1. *Analyzing and assessing livelihood consequences*: By conducting a partly *ex-ante* empirical case study of the Moroccan Noor$_o$ I project, this study explored how the deployment of CSP technology evolves around the livelihood realities of local communities and could lead to both positive and negative livelihood consequences.

2. *Improving practice*: The insights gained from the case study were combined with the analysis of existing sustainability frameworks from other fields and translated into a preliminary set of applicable sustainability safeguards and best practice guidelines in order to match the future design and operation of CSP technology with the development needs and livelihood realities of local communities.

The first objective aimed to contribute to the weak body of empirical scientific literature on the livelihood dimension of CSP projects and to increase the knowledge base regarding the often polarized debate between the pursuit of sustainable development in local communities versus utility-scale CSP development in the MENA region. The second objective intended to direct decision-making in the field of CSP deployment toward equitable and sustainable development so that any future CSP projects in the MENA region may reflect the actual development needs and aspirations of local communities and achieve high degrees of community acceptance at the project-level.

Rationale

Since the transition to a new energy system in the MENA region is coinciding with the efforts to transition to more democratic systems of governance, scaling up CSP technologies could be seen as both a technological and a social challenge. In the context of the new development objectives stemming from the 'Arab Spring', it is increasingly important to ensure that investments in new energy infrastructures address the needs and aspirations of citizens. In this regard, the rationale behind the study's two objectives stemmed from two reasons.

1. *Insufficient scientific understanding of the local livelihood dimension of CSP:* While numerous macro-studies fueled the recent surge in CSP investments by promising multiple macro-scale social, economic, environmental, and even geopolitical benefits, public

debates and discussions have raised considerable doubts and questioned whether these promises would also leave footprints at the local level. Despite these uncertainties, very little academic or practitioner research has been conducted to scientifically and empirically generate a sound understanding of the *social* or *human element* (defined as the livelihood dimension) of CSP at the local level. Considering the UNDP's 2011 Arab Development Challenges report, which states that "[…] there is need for a quick assessment of the social and economic benefits of potentially large infrastructural projects [such as the scale-up of CSP] and embarking on an open and transparent debate to decide on the most beneficial and viable projects" (UNDP, 2011:11), it is essential to address this knowledge gap by exploring CSP as a technology that could result in both livelihood benefits and adverse impacts in affected communities.

2. *Preventing a "race to the bottom" for CSP:* Furthermore, in the mid-term it is possible that concessional financing from Multilateral Development Banks (MDBs) will no longer be required as CSP technology comes down the cost-curve. In this case, private sector entities would finance the design, construction, and operation of projects. However, once MDB funding dries up or is not needed anymore, there could be a risk of a "race to the bottom" as international investors search for countries and locales with the least stringent environmental and social standards for project development. Just as the mining and forestry sectors and the Gold Standard for the Clean Development Mechanism (CDM) have addressed similar "race to the bottom" risks through the application of sustainability frameworks, it was found to be critical to initiate a discussion on how to complement existing safeguards with a comprehensive and balanced set of policies that go beyond the conventional economic objectives of private industry.

Report layout

In order to achieve the two main objectives, the study combined a top-down and bottom-up approach. In this combined approach, top-down knowledge drawn from the relevant academic and practitioner literature (sustainability and Social Impact Assessment (SIA)) was blended with the empirically derived bottom-up findings from the Noor$_o$ I case study in Ouarzazate. On the one hand, this ensured that the methodology reflected the relevant literature as well as existing approaches and that no issues covered in other sustainability frameworks were neglected at the beginning of the fieldwork. On the other hand, the combined approach ensured that locally specific issues identified in the field and community stakeholder perspectives were accounted for and reflected in the outcomes of the study.

The work was divided into five parts (Figure 1). In part A the essential theoretical foundations were set. Subsequently, part B provided the methodological basis for answering the research question including qualitative and quantitative methods applied during the empirical research and the data analysis. Part C provided thematic background information on CSP in general and the Noor$_o$ I project specifically. Part D comprised the results of the empirical analysis and assessment of Noor$_o$ I's livelihood dimension derived during two field visits to the Ouarzazate region. Based on the findings, part E translated the insights about the relationships between the Noor$_o$ I project and local livelihoods into project specific recommendations and a preliminary set of livelihood sustainability safeguards and best practice guidelines for future CSP projects.

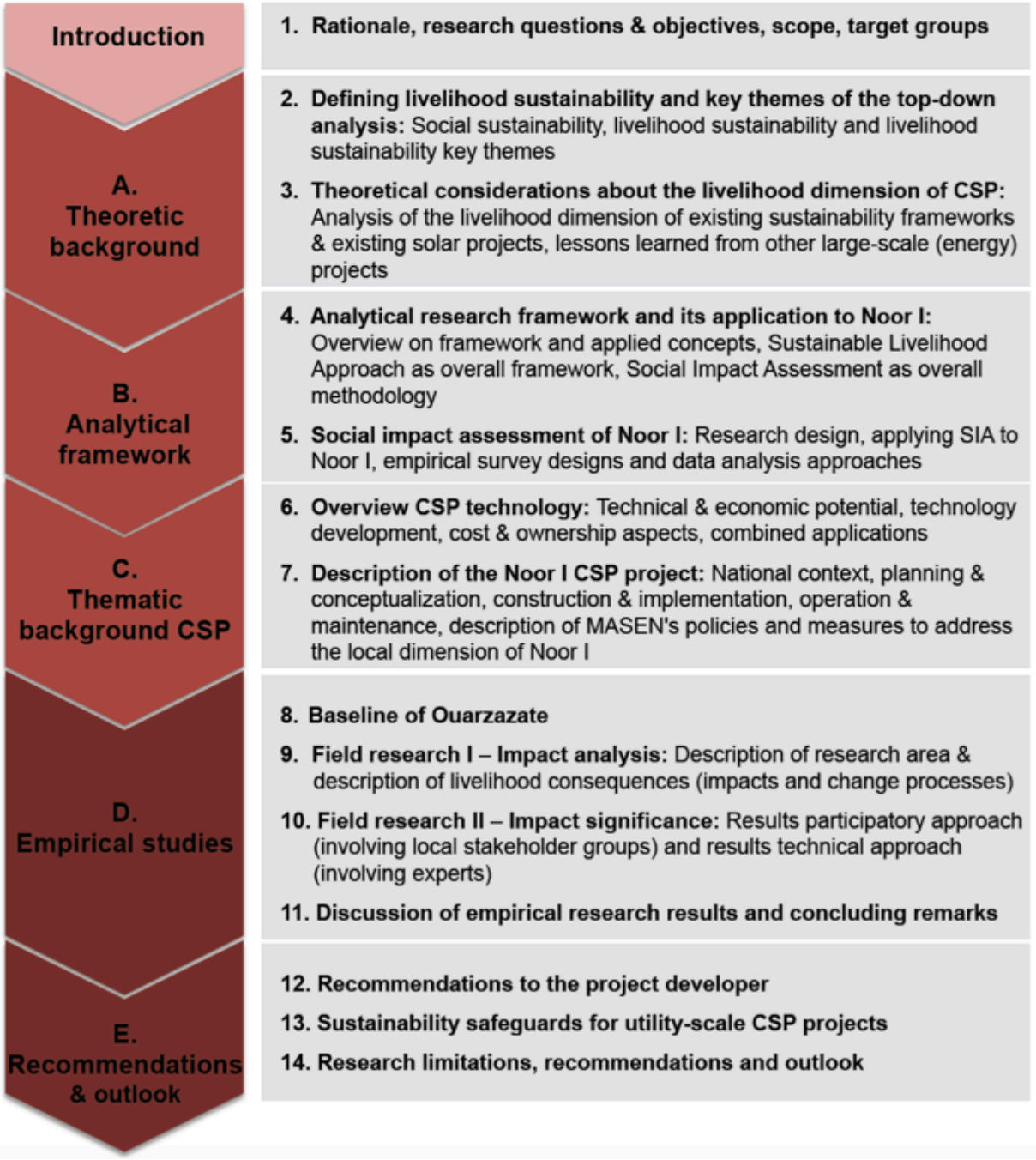

Figure 1: Overview of the report structure (parts and chapters)

A Theoretic background: sustainability frameworks, existing solar projects, and lessons learned from other large-scale (energy) projects

Safeguards from existing sustainability frameworks, international experiences with solar power plants, and lessons learned from other large-scale infrastructure projects all indicate potential processes of change in communities and their accompanying impacts on communities that could potentially materialize for the case of CSP in the MENA region. Hence, existing academic publications and practitioner experiences were reviewed to provide a theoretical starting point for the empirical impact analysis and assessment during the field research in Ouarzazate and to ensure that no issues covered in the literature were neglected at the beginning of the fieldwork.

In the first step, based on the review of existing sustainability frameworks from other fields, such as mining, the CDM, forestry or biomass trade (see Figure 2), an initial sustainability catalogue was developed to serve as a “development platform” to prove and anticipate social change processes and livelihood impacts during the field study, as well as to give guidance to the development of livelihood sustainability safeguards for CSP projects.

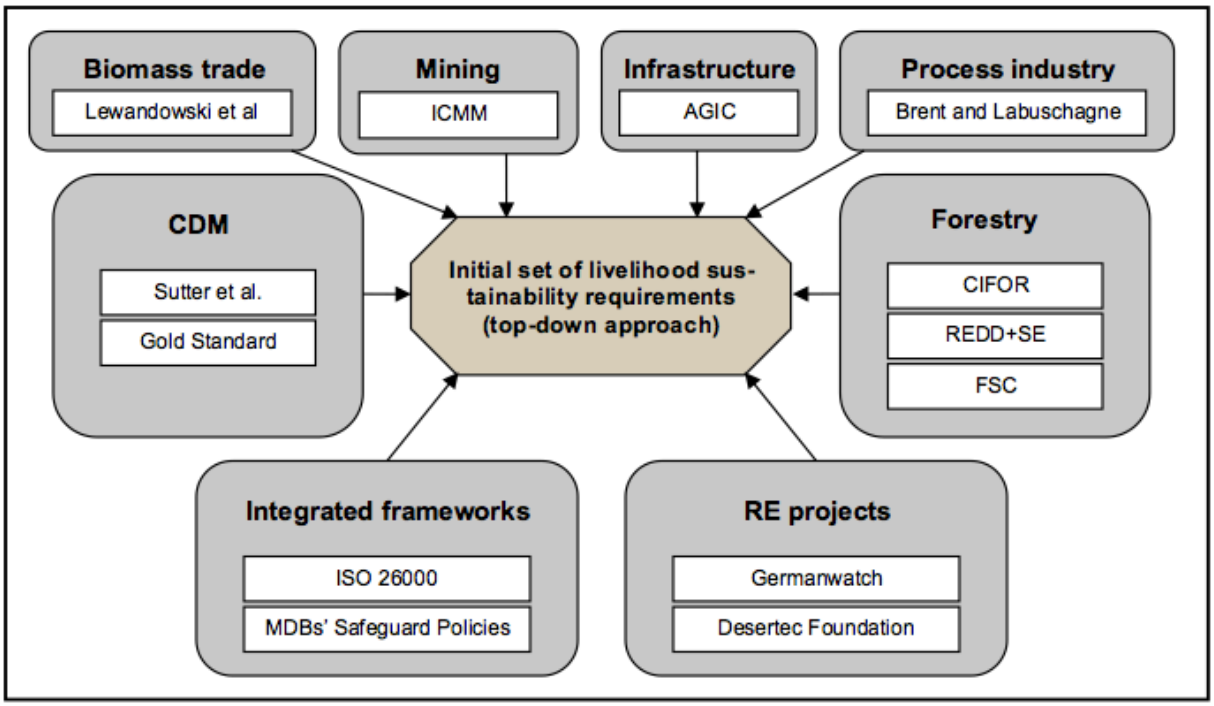

Figure 2: Schematic diagram of the screening process and its inputs from existing frameworks

In the second step, the initial sustainability catalogue was enriched by a review of the international experience with solar power plants (CSP and PV). Through the examination of the social consequences within existing Environmental Social Impact Assessment (ESIA) studies from South Africa, Egypt, and Morocco, a pool of social changes that could potentially stem from large-scale solar projects was derived to extend further the "development platform". Lastly, lessons learned from other large-scale energy infrastructure projects in Morocco and Egypt, as well as CSP plants in Spain and the United States, were taken into account to provide a third additional platform for the empirical analysis and assessment of Noor$_o$ I.

B Analytical research framework

CSP development does not occur in isolation but within socio-environmental systems. Therefore, exploring CSP's wide array of livelihood consequences is a complex task that cannot be based solely on technocratic, expert-led checklist approaches but on a combination of rational-scientific tools and the participation of local stakeholders. The research framework applied in this study, therefore, consists of two levels and their application to Noor$_o$ I as illustrated in Figure 3.

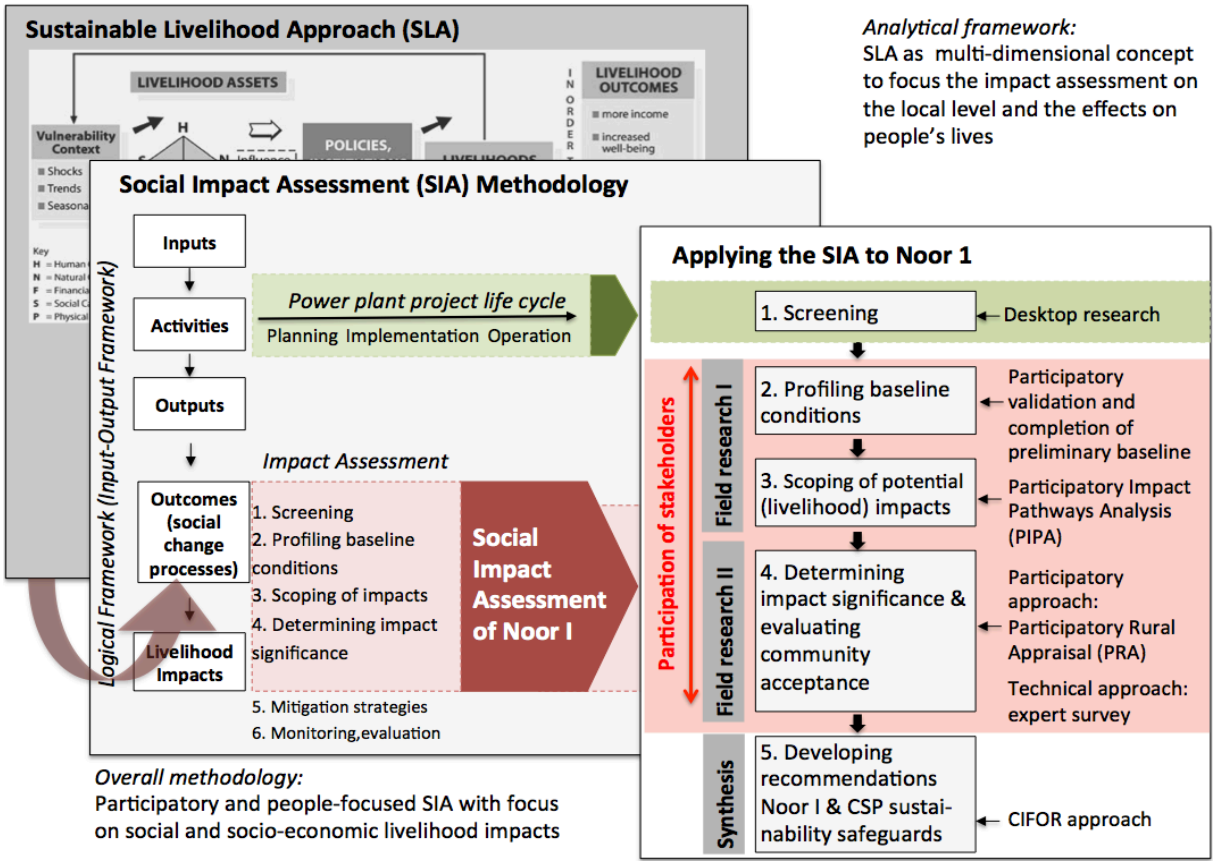

Figure 3: Two-level research framework of SocialCSP

At level 1, the *Sustainable Livelihood Approach (SLA)* was used as the overall framework for this study. It offers a conceptual framework to account for the complex social context in which infrastructure projects are implemented. At level 2, typical elements of a *Social Impact Assessment (SIA)* methodology were applied, providing an overarching concept with a number of consecutive steps to evaluate the social dimension of livelihood impacts. SIA allows for the broad involvement of local stakeholders, their context-specific local knowledge and local and international expert judgments at different levels of the research. Accordingly, participatory methods were applied at different stages of the assessment of $Noor_o$ I. Various local stakeholders and experts were involved during two field trips to the Ouarzazate region. During the first field trip, we conducted 87 exploratory interviews, 53 semi-structured interviews with community members, 13 key informant interviews, 16 community stakeholder interviews, 5 focus group discussions, and 1 validation workshop to identify and analyze the livelihood consequences stemming from $Noor_o$ I (from the 10th of January until the 08th of March, 2014). During the second field trip, 20 focus group discussions with a total of 106 local stakeholders and an expert survey with 25 local and international experts were conducted to assess and to determine the significance of the identified impacts (from the 26th of October until the 22nd of November, 2014).

C Thematic background: the case study of Noor$_o$ I in Ouarzazate, Morocco

As an early mover pioneering the feasibility of utility-scale CSP in the MENA region, Morocco is the first North African country to develop a stand-alone CSP project. As part of the national energy strategy, aiming to build 6 Gigawatt (GW) of utility-scale solar, wind and hydro projects, totalling in 42% of installed capacity by 2020, the 500 MW CSP complex near Ouarzazate under the Moroccan Solar Plan (MoSP) is a game changing step within the country's transition toward a more sustainable energy system. Due to its pioneering role, the project's success is widely regarded crucial to determine whether CSP technology will be embraced by other countries, both in the MENA region and globally, as an accessible low-carbon alternative needed to offset planned conventional electricity infrastructures. Coordinated by the Moroccan Agency for Solar Energy (MASEN), the first phase of the solar complex (Noor$_o$ I) is a 160 MW CSP plant with a parabolic mirror field and salt-based thermal storage system with three hours of capacity, and a water-cooled steam cycle. Noor$_o$ I, is currently under construction by the Saudi Energy and Water company, ACWA Power, and is slated to become operational by the end of 2015. The planned second phase is 200 MW parabolic trough, the third 150 MW CSP tower (both with dry cooling and a minimum of seven hours storage) and the fourth 50-70 MW photovoltaic (see Figure 4). When the third phase is complete, the Noor$_o$ solar complex will be among the largest CSP plants in the world.

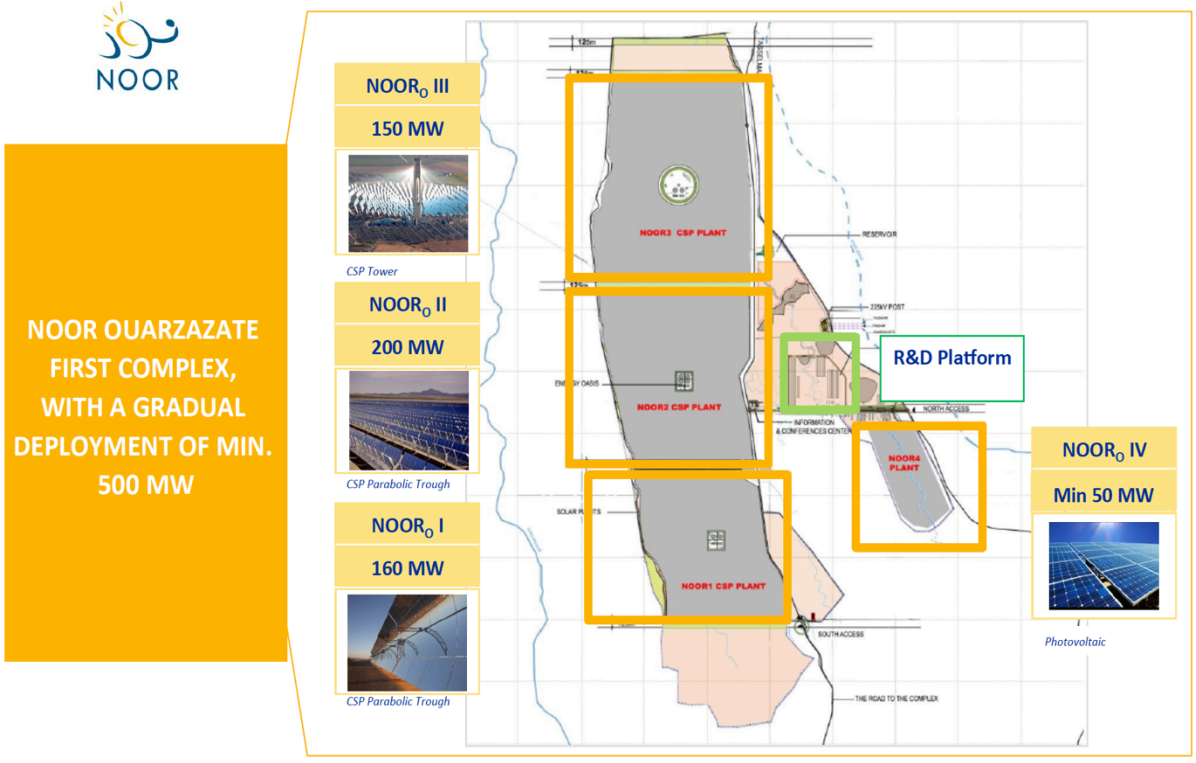

Figure 4: The different project stages of the Noor$_o$ solar complex
Source: MASEN, Personal Interview, 2014.

However, the Kingdom has not simply prioritized its solar ambitions out of concern for the climate, but rather as a means to secure climate-compatible and more inclusive development. As an *integrated solar development project,* the $Noor_o$ solar complex also intends to provide expertise and technological know-how and contribute to local and regional socio-economic development. MASEN's measures to address social and socio-economic aspects at the local level of $Noor_o$ I encompass, among others, a public consultation process, a Land Acquisition Plan (LAP), a Social Development Plan (SDP), and an Environmental and Social Management Plan (ESMP). Further positive socio-economic effects were addressed by efforts to increase skill development and training, research and development, and the industrial integration of the solar complex through a voluntary 30% to 35% local content target in order to develop a domestic industry base for the MoSP.

D The empirical study

The development of the $Noor_o$ I project in the Atlas Mountains of southern Morocco is situated within a complex livelihood context, characterized by a combination of environmental deterioration, social pressure, and economic marginalization. The communities included in the main research phase were selected in two stages. During a first internal workshop, based on the knowledge of the research team as well as a variety of regional, local, and project related maps, an initial research area and its geographical boundaries were drawn. During this process the research team selected eight communities in an area extending over a radius of 130 km that were likely to be affected either directly or indirectly by the $Noor_o$ I plant. While the definition of the research area was a precondition for the first round of interviews, the insights gained during the exploratory interviews in every community considered potentially relevant during the first internal team workshop required an adjustment for further research. In a second internal team workshop, the initial research area was then re-defined and each of the initial eight communities ranked according to specific project related and community specific criteria that emerged out of the analysis of the exploratory interviews and reflected how the communities might be affected by the project. Based on both the ranking and the predicted amount of time required per community, the research team decided to focus the subsequent research on the four most affected communities, extending over a radius of approximately 60 km. The final research area included the following communities (see Figure 4):

- the layered set of communities of the rural Commune of Ghassate immediately adjacent to $Noor_o$ I,
- the provincial capital of Ouarzazate (including Tabounte),
- the downstream oasis of Agdz, and
- the community of Idelsane.

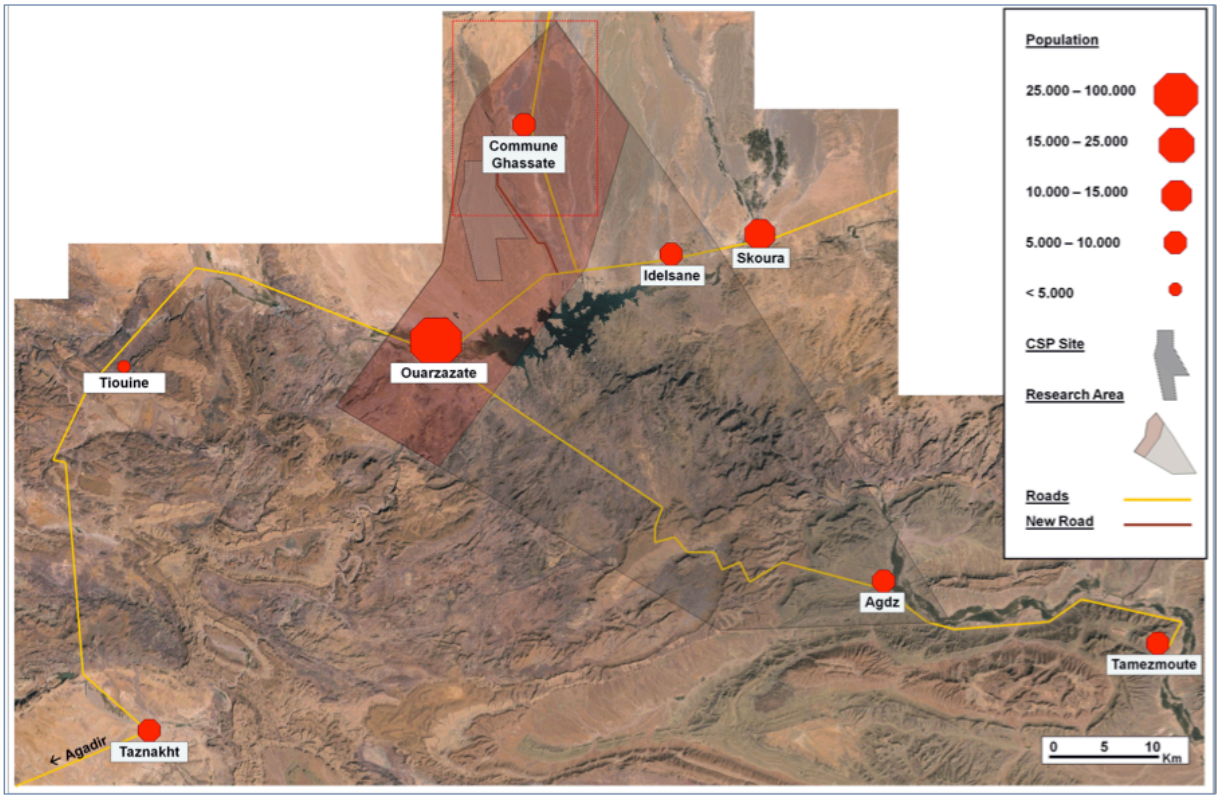

Figure 5: The final research area
Note: Red = primary area, grey = secondary area.

Key findings

Although Noor$_o$ I has yet to be commissioned, the planning and construction phases have already had positive and negative effects on people's livelihoods, varying within and between communities across the different project phases. While direct, indirect, and cumulative impacts could already be observed for the completed project phases, the assessment also included anticipated impacts for the operational phase based on local stakeholder input and expert judgments. Grouped under the six SLA capitals, the results of the field research and data analysis allowed for an illustration of the livelihood dimension of Noor$_o$ I (see Figure 5) and establishing a set of 30 impacts, many of them cutting across different livelihood dimensions (see positive impacts in Table 1 and negative impacts in Table 2). The significance level of each impact was also established.

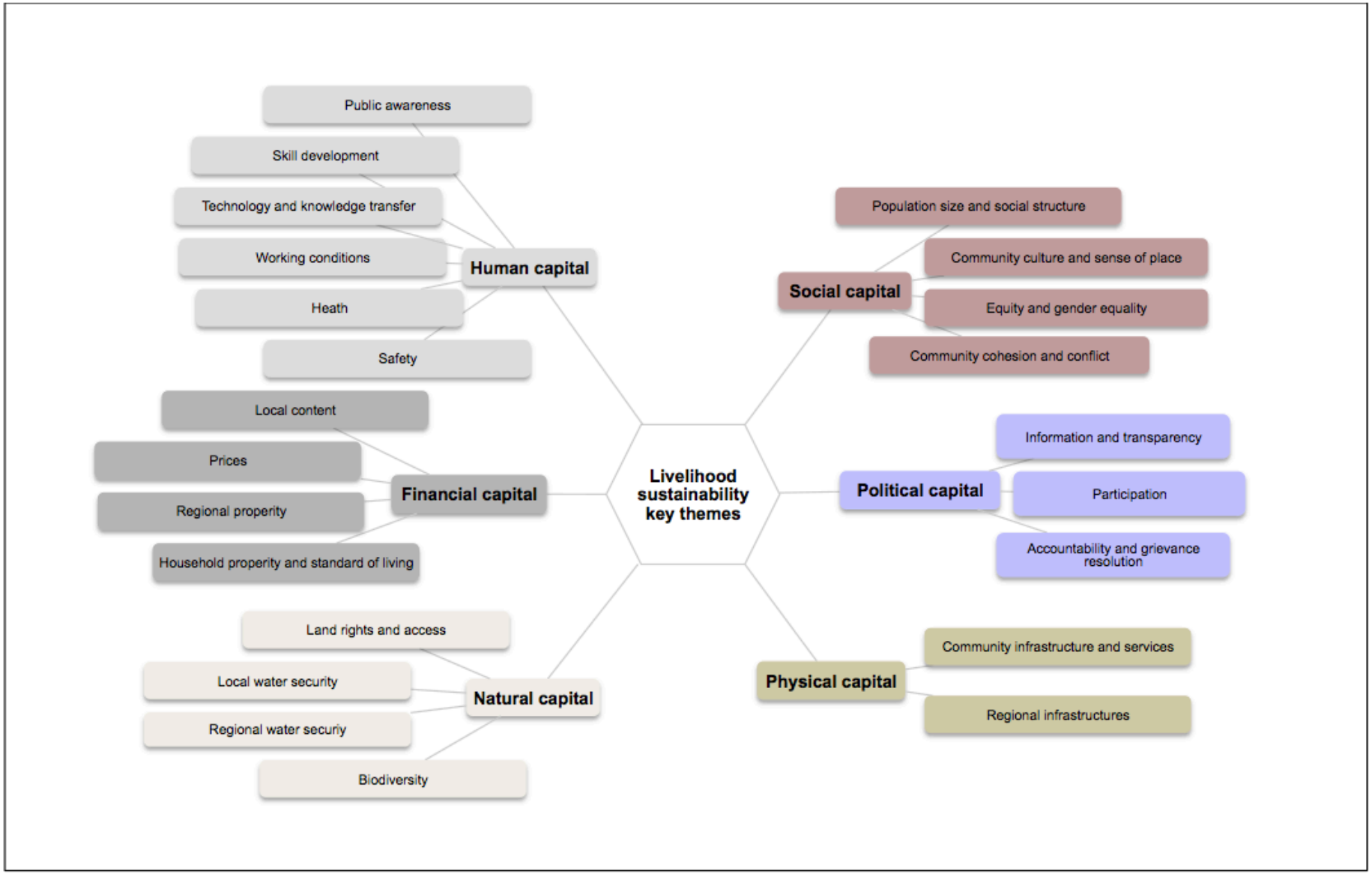

Figure 6: Livelihood sustainability key themes that emerged during the field research

While many renewable energy projects in Europe are faced with a *Not-In-My-Backyard (NIMBY)* attitude, the introduction of Noor$_o$ I was received very positively in the region of Ouarzazate. These findings contrast the skepticism and critique in the popular media and academia that usually arises from the typical "conflict-oriented" portrayal of deploying large-scale renewable energy projects in North Africa and the perception that exporting electricity from North Africa to Europe, or even from local communities to other parts of Morocco, would necessarily end in exploitative, neocolonial relationships. Because approval and support of community stakeholders cannot be taken for granted but is highly dependent upon the project developer's *social license to operate* at the local level, much of Noor$_o$ I's high degree of community acceptance can be attributed to MASEN's approach that addressed the livelihood dimension of the project. As the electricity generated at Noor$_o$ I will be routed to the country's southeastern cities in order to meet Morocco's growing electricity demand, MASEN has made great effort to align CSP deployment with the region's livelihood context to meet broader human development objectives and to integrate the project within the productive structure of the local economy. Yet, CSP technology is not a panacea to alleviate regional poverty and to deliver broader socio-economic development gains. Consequently, most of the benefits stemming from Noor$_o$ I were evaluated as being of low to moderate significance (see Table 1).

Apart from indirect positive effects, such as strengthened family ties and social support from reversed migratory flows and an increased public interest in renewable energy, the creation of local employment opportunities, strengthened capacity, and improvements to social infrastructure in adjacent communities were found to be the most significant ways for demonstrating shared value and providing direct development prospects.

SLA issues	Positive livelihood impacts	Status	Average significance evaluation	
			by community (stakeholder)	by experts
Population size and social structure	*Strengthened family ties and social support*	*Observed/ Anticipated*	Low	Low
Community culture and sense of place	*Intensified local pride and gains for regional reputation*	*Observed*	Low	Moderate
Equity and gender equality	*Preferential treatment of local communities and socio-economic inclusion of women*	*Observed*	Low	Low
Community infrastructure and services	*Improved living conditions in adjacent communities*	*Observed*	Moderate	Low
Regional infrastructure	*Spurred regional socio-economic and infrastructure development*	*Anticipated*	Low	Moderate
Local content	*Economic participation and benefits for local SMEs*	*Observed*	Very low	Low
Household prosperity and standard of living	*Improved socio-economic situation and standard of living*	*Observed*	Low	Moderate
Regional prosperity	*Increased regional prosperity and value added*	*Observed*	Low	Moderate
Public awareness	*Increased public interest in renewable energy systems and civil society engagement*	*Observed*	Low	Moderate
Skill development	*Benefits from skill development and knowledge transfer particularly among youth*	*Anticipated*	Low	Moderate
Technology and knowledge transfer	*Strengthened technological capacity of local firms*	*Anticipated*	Very low	Low

Impact significance
Very low
Low
Moderate
High
Very high

Table 1: Overview of positive livelihood impacts stemming from Noor$_o$ I

While community outcomes of large-scale investments are rarely the focus of governments or investors, and generally only marginally benefit the local population, MASEN's foresight and planning that sought to generate positive impacts from the country's first standalone CSP plant were commendable. Yet, the project also resulted in negative impacts (see Table 2).

SLA issues	Negative livelihood impacts	Status	Average significance evaluation	
			by community (stakeholder)	by experts
Population size and social structure	*Loss of social standing and political influence*	*Anticipated*	Very low	Low
Community culture and sense of place	*Accelerated change of community atmosphere and cultural identity*	*Anticipated*	Low	Very low
Community cohesion and conflict	*Social conflict, rivalry and feelings of envy*	*Observed*	Low	Low
Information and transparency	*Uncertainty, unrealistic expectations, and frustration*	*Observed*	Low	Moderate
Participation	*Social exclusion and powerlessness in decision-making*	*Observed*	Moderate	Low
Accountability and grievance resolution	*Suspicion towards the project, its developers as well as community protest*	*Observed*	Very low	Low
Regional infrastructure	*Strain on regional infrastructure and services*	*Anticipated*	Low	Very low
Land rights and access	*Decreased psychological well-being and loss of cultural attachment in adjacent communities*	*Observed*	Low	Low
Local water security	*Decreased water security in the community of Tasselmant*	*Observed*	Very low	Low
Regional water security	*Deprivation of farming livelihoods in Ouarzazate and cascading effects in the downstream oases of the Draa Valley*	*Anticipated*	High	Low
Biodiversity	*Deprivation of subsistence activities in adjacent communities*	*Anticipated*	Very low	Low
Local content	*Economic exclusion of micro-scale SMEs*	*Observed*	Moderate	Low
Household prosperity and standard of living	*Deteriorated socio-economic situation and standard of living in adjacent communities*	*Observed*	Very low	Low
Prices	*Erosion of local purchasing power and decreased standard of living among low-income groups*	*Anticipated*	Very low	Low
Skill development	*Mismatch between educational qualifications and labor market requirements*	*Observed*	Moderate	Moderate
Working conditions	*Poor and unequal labor conditions*	*Observed*	Moderate	Low
Health	*Influence of noise, dust and vibration on psychological well-being*	*Observed*	Low	Very low
	Environmental pollution	*Anticipated*	Very low	Very low
Safety	*Increased crime and fatal road accidents*	*Anticipated*	Very low	Very low

Impact significance
Very low
Low
Moderate
High
Very high

Table 2: Overview of negative livelihood impacts stemming from Noor$_o$ I

In light of the region's livelihood context, most of the negative effects stemming from Noor$_o$ I are only partially attributable to project activities, but must instead be interpreted as a magnification of the existing sustainability challenges in the project region. Additionally, the bulk of negative consequences are neither specifically attributable to CSP technology nor to the local context. Rather, these drawbacks are inevitably experienced with most utility-scale infrastructure projects in remote areas around the globe. Yet, unlike the potential harm associated with fossil fuel power plants, the negative footprint of Noor$_o$ I was found to be generally low and significantly lower in areas such as damage to public health, air and water pollution. However, serious concerns about the project's operational water demands, an education-labor market mismatch, unequal working conditions, unfulfilled expectations about positive livelihood opportunities and their intransparent distribution, as well as the perceived lack of community engagement (procedural justice) to give affected communities a stake in Noor$_o$ I and to obtain prior and informed community consent have all blurred community perceptions. As a consequence, especially the community protests during the construction phase and local opposition in communities directly neighboring the power plant can be explained by some of these shortcomings. Although community resentments had little to do with the CSP technology itself or Noor$_o$ I project - with the exception of the water concerns -, and despite being in full compliance with national laws and international procedures, we conclude, that if the procedural deficits remain unsolved, and the project's operational water demands would compete with future domestic uses, this could result in a scenario in which utility-scale CSP projects in general, and the Noor$_o$ solar complex in particular could become risky due to existing social conflict, decreasing community acceptance and increasing opposition in affected communities.

E Recommendations and sustainability safeguards

Based on both the results of the impact assessment and the suggestions provided by various local stakeholders, recommendations for the MoSP and sustainability safeguards for utility-scale CSP in the MENA region were derived.

Recommendations

Given that Noor$_o$ II, Noor$_o$ III and Noor$_o$ IV in the Ouarzazate region and other utility-scale solar projects in Morocco are currently in the planning phase (e.g., in Midelt and Tata), there is an opportunity now for MASEN to address some of these issues in the planning and implementation schemes for the next phases of the Noor$_o$ solar complex in Ouarzazate and to use them as a guidance for other CSP projects under the MoSP. As the impacts of Noor$_o$ I are mainly related to the procedural dimension, the recommendations particularly emphasize on shifting from a formal model of compliance-based community consultation towards the sphere of informal community engagement procedures with improved collaboration and shared decision-making among local authorities, project developers, and affected communities. Furthermore, aspects like distributional equity, mitigation of negative impacts, and enhancement of positive impacts are addressed.

1. *Establish a structured approach to conduct in-depth participatory stakeholder analysis:* By conducting a participatory stakeholder analysis prior to the development of any future CSP plant, the needs of affected and interested community groups could be identified prior to implementation. Ideally, this process would include a wide cross-section of the local population instead of just elected representatives or a select group of spokesmen.

2. *Move the "Environmental and Social Impact Assessment (ESIA)" beyond compliance with international standard procedures towards a participatory and community-oriented approach:* The ESIA provides only limited coverage of social impacts and lacks participatory elements. It is therefore not sufficient to assess all impacts on the local communities. Hence, a social impact assessment (SIA) should be conducted in addition to the required ESIA, focusing on local needs, capacities, concerns, and aspirations.

3. *Broaden the stakeholder engagement:* Informal participation should be added to the legal requirements of formal consultation measures to ensure that vulnerable groups that are difficult to reach or do not have the resources to voice their opinion are included.

4. *Adopt an ongoing communication and expectations management strategy*: Information should be publicly disclosed prior to decisions in culturally appropriate formats. Furthermore, because access to information does not mean the information is understood, a type of "community outreach task force" could be established to manage expectations and act as a link between authorities, project developers, and the local population.

5. *Empower local civil society associations and organizations as agents of change:* As important opinion leaders and multipliers, local civil society associations and nongovernmental organizations (NGOs) should be involved in the communication and community engagement processes, for example through feedback meetings, joint advocacy campaigns, or a jointly operated visitor center. Such a center could be a meeting point for exchange and public outreach to strengthen the relationships between the project and its neighboring communities. Moreover, it could increase awareness and become an interesting tourist destination with local economic opportunities (e.g., the sale of local handicrafts or organized tours in neighboring communities).

6. *Promote gender equality and women's empowerment:* Employment and income benefits are mostly captured by men. Moreover, women often have no say in decision-making processes. In order to contribute to gender equality, women should be included in the recruitment process and receive the opportunity to improve their skills and competencies through specific training.

7. *Adopt a precautionary approach that allows for technological flexibility to respond to changes in the Mansour Eddahbi reservoir's water capacity:* Due to the high uncertainties with regard to the effects of climate change and societal water demands on the Mansour Eddahbi reservoir, the operational water withdrawal of Noor$_o$ I has to be closely monitored. If the water security of the downstream oases cannot be guaranteed in the future due to a further decrease of the water levels, compensation should be provided to affected communities to prevent future impoverishment.

8. *Increase the absorptive capacities and integrate local industries and university graduates:* The development of competencies and skills among local SMEs and students should be further promoted. To do so, local SMEs should receive further vocational training and skill development opportunities. Additionally, the curricula of the university programs in Ouarzazate should be aligned to match the CSP market requirements.

9. *Allocate parts of the economic revenues, royalties, and taxes to local communities:* Instead of going to the central government, a share of revenues, royalties, and taxes should be decentralized and provided to local communities affected by the project.

10. *Accompany the MoSP with additional measures to foster sustainable development:* CSP projects can contribute to a region's development, but they cannot solve all existing social, environmental, and economic problems. Thus, efforts and commitments well beyond an energy infrastructure project are required. Development projects of the Moroccan government or international organizations should be aligned with the MoSP in order to enhance the socio-economic development of rural areas and to increase their resilience towards environmental pressures.

Social sustainability requirements CSP

Finally, a set of 18 livelihood sustainability safeguards and best practice guidelines was developed in order to help project developers, governments, and international lenders to address the needs and livelihood realities of local communities by building up CSP capacities in the MENA region (Table 3). The proposed safeguards are based on the research results of the impact assessment, the initially developed criteria catalogue, and a second screening process of existing sustainability frameworks. Five categories have been formulated to group the set of elaborated sustainability safeguards considering guiding principles, criteria and sub-criteria to specify principles and guidelines to operationalize the criteria. The following list summarizes the categories and briefly describes the guiding principles by mentioning intended key objectives of proposed criteria of the study:

(1) *Overarching safeguards:* With *human rights* and *vulnerable groups* as guiding principles, vulnerable groups should be addressed to protect their interests, rights, and needs. A comprehensive impact assessment helps to gain a clear picture about all community level impacts resulting from the project and to formulate mitigation measures for adverse impacts and enhancement measures for project benefits. To address vulnerable groups and to assess impacts of crosscutting issues, the acknowledgment of human rights forms the baseline criterion for the design and development of the project.

(2) *Procedural safeguards:* Based on the three guiding principles – *community engagement and information closure*, *accountability*, and *project governance* – stakeholders should be empowered in the decision-making process. Moreover, the community should consent to the development. Relevant groups of community stakeholders should be informed in a timely, clear, and transparent way about all aspects of the project. It should furthermore be guaranteed that project's outcomes and processes meet community expectations. Awareness about renewable energy and climate change mitigation in general and in connection to the specific project should be strengthened among relevant groups of stakeholders. Compliance with law is a precondition to enable rightsholders to realize their rights within the project. Grievances and disputes that arise during all project phases should be handled in a transparent and accountable way in order to identify, prevent, or mitigate conflicts resulting from the project. Finally, a comprehensive and transparent governance structure for the project and the prevention of any form of corruption associated with the project's outcomes and processes should be considered.

(3) *Distributional safeguards:* Based on the two guiding principles – *benefit sharing* and *compensation* – affected groups of community stakeholder should receive a reasonable share of benefits (distributional equity). It should further be ensured that women and men gain equal benefits from the project. In addition, a fair compensation of stakeholder groups who are adversely affected by the project should be guaranteed.

(4) *Mitigation safeguards:* According to the guiding principles *land, water, conservation, cultural heritage, infrastructure and services, health and safety, and working conditions*, any kind of livelihood depletion of affected community groups should be avoided. This includes loss of land or access to land, increase in potential water insecurity due to the project, or adverse effects on conservation values and biodiversity. Moreover, traditions, values, and cultural identity should be respected to prevent disruption of social cohesion within affected communities. It should further be ensured that the project and its associated processes like the influx of workers will neither constrain the availability and the access to local infrastructure and services nor negatively impact the health and safety of local residents. Finally, working conditions should respect international labor rights and standards, ensuring decent working conditions and a safe working environment while avoiding discrimination.

(5) *Enhancement safeguards:* Based on the guiding principles *local content and employment*, *capacity building*, and *combined applications and voluntary actions*, a reasonable share of the project's costs should be spent locally, guaranteeing local procurement of components and services. This should be combined with the maximization and prioritization of employment opportunities to the most affected communities. Moreover, local skills and absorptive capacities and the technology and knowledge transfer among local, regional and international companies and institutions should be enhanced.

Safeguards		
Category	**Guiding principle**	**Criteria**
(1) Overarching safeguards	**Principle 0** *Human rights*	0.1 Human rights acknowledge
	Principle 1 *Vulnerable groups*	1.1 Protection of vulnerable groups
	Principle 2 *Impact assessment*	2.1 Comprehensive impact assessment
(2) Procedural safeguards	**Principle 3** *Community engagement and information disclosure*	3.1 Comprehensive community stakeholder engagement 3.2 Transparency and information disclosure 3.3 Expectation management 3.4 Awareness raising
	Principle 4 *Accountability*	4.1 Compliance with law 4.2 Grievance resolution
	Principle 5 *Project governance*	5.1 Governance structure 5.2 Anti-corruption measures
(3) Distributional safeguards	**Principle 6** *Benefit sharing*	6.1 Distributional equity 6.2 Contributions towards gender equality and non-discrimination
	Principle 7 *Compensation*	7.1 Fair compensation
(4) Mitigation safeguards	**Principle 8** *Land*	8.1 Land use and access to land
	Principle 9 *Water*	9.1 Water security (water availability and access)
	Principle 10 *Conservation*	10.1 Protection of high conservation values and biodiversity
	Principle 11 *Cultural heritage*	11.1 Protection of cultural heritage
	Principle 12 *Infrastructure and services*	12.1 Availability of and access to infrastructure and services
	Principle 13 *Health and safety*	13.1 Safeguards of communal health and safety
	Principle 14 *Working conditions*	14.1 Decent work conditions 14.2 Occupational health
(5) Enhancement safeguards	**Principle 15** *Local content and employment*	15.1 Economic participation of local industries 15.2 Locally sourced workers
	Principle 16 *Capacity building*	16.1 Skill development 16.2 Technology transfer 16.3 Knowledge transfer
	Principle 17 *Combined application and voluntary actions*	17.1 Combined applications 17.2 Identification and implementation of voluntary actions

Table 3: Overview of safeguard categories, guiding principles, and criteria