



Desertec and Human Development at the Local Level in the MENA-Region

A human rights-based and sustainable livelihoods analysis

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Abstract

So far the Desertec vision of a joint energy partnership between the European Union (EU) and the Middle East and North Africa (MENA) region to promote sustainable development in view of global challenges has been primarily represented and discussed in terms of technical parameters and the narrow application of economic cost-benefit-analysis.

This technocratic perspective, however, is insufficient to capture potential socio-political and socio-economic impacts that such a purposive transition could have on either the livelihoods of the people in the MENA-region or the success of the concept itself. Without addressing the concept's human development dimension, it is likely to offer – next to climate benefits – only a few trickle-down effects and instead bears a high risk to generate numerous adverse impacts particularly on the most vulnerable groups of society. Thus, in order to improve the concept's outcomes, and guarantee not only its economic viability but at the same time move it towards equity and sustainability, Desertec has to be understood in a much wider setting.

In this regard, this study's purpose is to develop an analytical, process-driven framework, which provides a bottom-up guidance to integrate sustainable livelihoods and human rights into the Desertec concept to emphasize sustainable human development issues at the local scale in the MENA-region.

In order to analyze and assess how the Desertec concept could impact the livelihoods of people living in the MENA-region and identify which human rights are affected, this study draws upon a human rights-based approach implemented into a sustainable livelihood framework. Based on the sustainable livelihood framework the integration of human rights provides valuable entry points for a comprehensive accounting of the distribution of the project's potential livelihood opportunities and challenges across geographical and social space. The focus on human rights tangent to Desertec thereby shifts the former technology and energy secu-

rity-oriented perception of the concept towards a more people-centred assessment based on the views, needs, strengths, livelihoods and legitimate claims of the people in the MENA-region.

Against the analytical background of the livelihood-human-rights-analysis, this paper concludes with a first set of sustainability principles and recommendations. This framework intends to give guidance on improved decision-making processes that could pursue a better achievement of the Desertec vision in the MENA-region and also serves as a conceptual starting point for dialogue among civil society, political stakeholders and industrial project planners.

Preface

“Why shall we limit ourselves to export fruit to Europe? Why not solar energy? This would boost sustainable development much more!”

How do we answer this sincere question raised by an Egyptian diplomat during a conference in Berlin where the preliminary findings of this study had been presented? Will Desertec bring green development to Egypt? Could it be of benefit for poor people? Or will it be just another big infrastructure project with adverse impact on local populations like many critical observers suggest?

Due to high solar radiation intensity, Egypt as basically all other countries in the Middle East and North Africa (MENA) has a huge potential to produce and export solar energy. So far this abundant potential has not been used, neither to overcome energy scarcity in the countries themselves (which are still depending on costly and climate-unfriendly fossil fuels), nor to foster economic and social development in these countries with high rates of youth unemployment – despite very skilled people.

The Desertec concept envisions a different world where the MENA region turns into a big producer – and exporter – of electricity, produced through an inter-woven net of renewable energy plants and being transferred – through a super-grid – to Europe and neighbouring African countries. According to this vision, Desertec would stimulate development in the MENA region while Europe would be provided with clean electricity – hence a win-win situation for both sides.

Notwithstanding its promised benefits, there are, however, considerable concerns that such a vision could simply be a “fevered dream” which may not live up to its expectations. The global record of comparable large-scale, export-oriented infrastructure projects is littered with examples, where deliberately and strategically overestimated benefits and underestimated costs of well-designed technologies quite often resulted in inaccurate forecasts and inflated cost-benefit ratios. What might be

beneficial at the macro level must not necessarily benefit stakeholders – in particular poor populations – at the local level. In the worst case Desertec might even become a solar version of the resource curse.

This is why “Brot für die Welt” and “Germanwatch” have decided to conduct this study. It aims at providing a methodology which helps to assess the possible impact of Desertec projects on human rights and livelihoods of local populations in a targeted and systematic manner. The methodology is designed in a way that can be taken up by different stakeholders such as NGOs, local planning authorities, project developers and power companies as a tool that contributes to broad stakeholder participation and coherence with human rights in the planning as well as in the implementation stage.

We do believe that the study can help to fill a gap. Despite some recent activities by the Desertec Industrial Initiative (DII) to comprise an integrated socio-economic assessment to the concept (DII, 2011b), the Desertec vision to promote sustainable development in view of global challenges so far has been primarily represented and discussed in terms of technical and regulatory parameters and the narrow application of economic cost-benefit-analysis. This mainly technocratic perspective is delusive as it fails to sufficiently capture potential socio-political and socio-economic impacts which such a purposive transition could have in a positive as well as in a negative way on either the livelihoods of the people in the MENA-region or even the success of the concept itself.

It seems necessary to incorporate a broader perspective. It is crucial that the Desertec vision can be integrated in a concept of transformative change which supports not only climate goals and energy security in Europe but also the development perspectives and democratic stabilization of a rapidly changing MENA region as well as human rights and livelihoods in the relevant regions.

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1 Introduction

1.1 The Desertec concept and complimentary approaches

1.1.1 The Desertec concept

The most well known concept for large-scale deployment of Concentrating Solar Power (CSP) in the MENA-region is the Desertec concept. The Desertec concept describes a pathway for the future electricity supply supported by different renewable energy sources, with a focus on CSP located in the southern and eastern riparian of the Mediterranean Sea, for the EU-MENA-region.

The visionary concept promoted by the Desertec Foundation, aims at tackling different global challenges simultaneously: a low-carbon energy future for the EU-MENA region, water and food security as well as prosperity and development options for the MENA-region (Desertec Foundation 2009a, 6). Figure 1 illustrates the benefits as promoted by the Desertec concept and as understood by the authors in a security context.

The Desertec concept builds upon the favourable physical conditions, which are among the best of the world for the generation of solar power (e.g., abundant sunshine and low humidity). Due to these conditions the MENA-region has huge potentials and substantial advantages compared to other regions (Erdle 2010, 1). However, until now, these potentials are utilized to a minimum amount. The electricity generated within the Desertec concept is anticipated to fully satisfy the energy needs of the MENA-region, while its overall costs are estimated to be in the range of EUR 400 billion (Vallentin and Viebahn 2009, 30; Werenfels et Westphal 2009, 8). Furthermore, the concept envisions solar exports from the MENA-region to Europe via High-Voltage Direct Current (HVDC) lines. By 2050, 15% of the European electricity demand could be provided by electricity gen-

erated from renewable energy sources in the MENA-region (TREC 2008, 52; Trieb and Mueller-Steinhagen 2007, 213-214). Solar electricity from the MENA-region could therefore be a valuable contribution to the power generation portfolio of the EU (Desertec Foundation 2009b, 36). Furthermore, the large-scale deployment of renewable energy sources in the MENA-region could lead to a substantial reduction of greenhouse gas-emissions compared to a business-as-usual scenario. The Desertec concept mentioned a reduction of CO₂ to 38% in the year 2050 compared to the emissions of the year 2000 for the EU -MENA-region (Desertec Foundation, 2009B, 44).

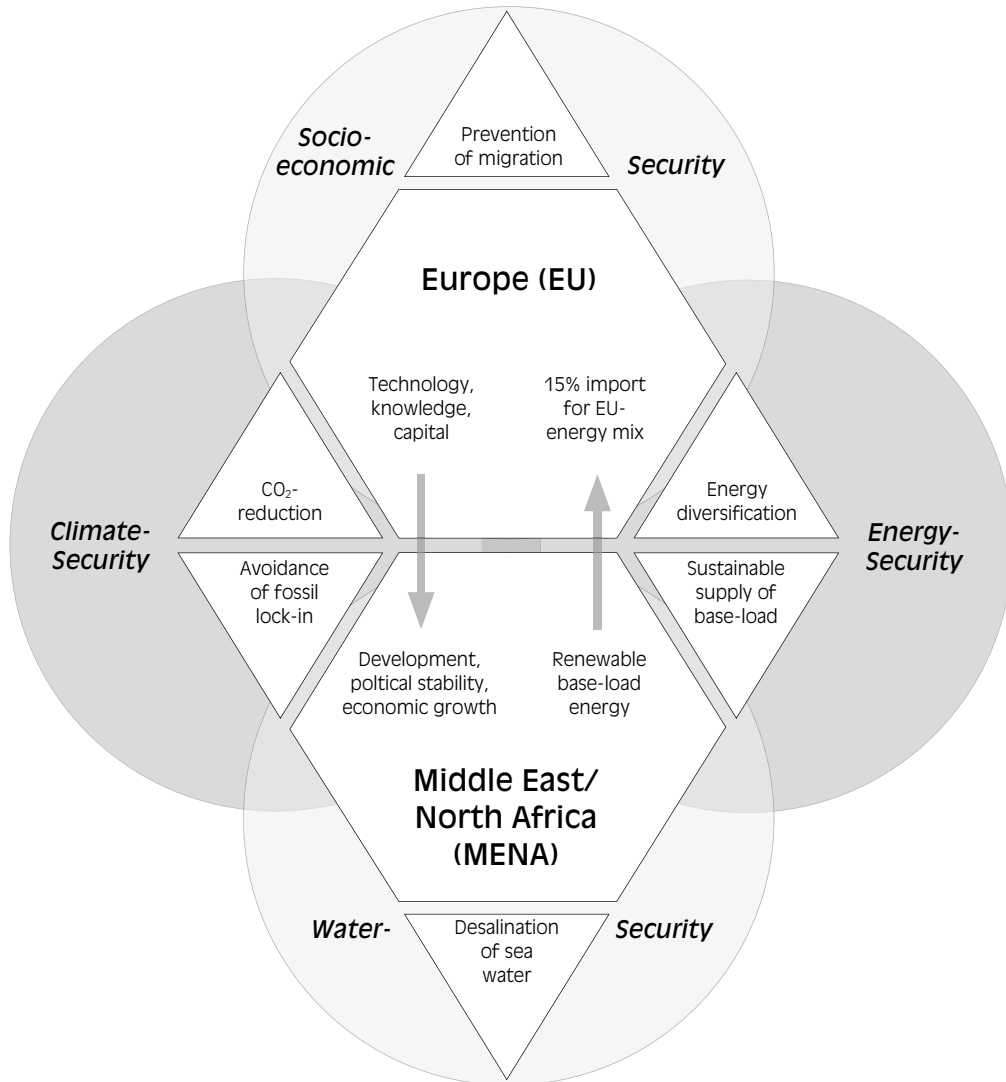
As an additional benefit, it is possible to combine CSP plants with different desalination technologies and, hence, produce drinking water for the MENA-region (Desertec Foundation 2009a, 9). The MENA-region could also benefit from technology and know-how transfer from the EU and, therefore, realize development potentials with regards to local industries and new sources for income and employment (Desertec Foundation 2009b, 55). Overall, the MENA-countries could “[...] gain a first-mover advantage in an emerging technology [...]” (Erdle 2010, 1), while the fairly ambitious vision of the Desertec concept presents a cooperative approach to deal with challenges, such as, energy, water, climate and socio-economic security. Consequently, the implementation of the Desertec concept could foster cooperation and interdependency between the MENA – and the EU-region.

1.1.2 Key players of Desertec

The idea of the Desertec concept goes back to the Trans-Mediterranean Renewable Energy Cooperation (TREC). TREC was founded in 2003 as a partnership of the Club of Rome, the Hamburg Climate Protection Foundation (HKF) and the National Energy Research Centre (NRC) of Jordan. The concept has been further investigated and developed in three detailed studies¹ by the German

¹ The Desertec concept is described in detail in these three studies: Med-CSP (DLR, 2005), TRANS-CSP (DLR, 2006) and AQUA-CSP (DLR, 2007)

Figure 1: The Desertec concept as understood by the authors



Source: Schinke and Klawitter, 2010

Aerospace Center (DLR) on behalf of the Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU).

The non-profit Desertec Foundation was established in 2009. Founding members are various scientists of TREC, the German Association of the Club of Rome as well as private committers and long-term promoters of the Desertec concept (Desertec Foundation 2011). In October 2009, the Desertec Foundation and twelve large companies, among them Munich Re, Deutsche

Bank, Siemens and Schott Solar officially founded the Desertec Industrial Initiative (DII). While the Desertec Foundation can be regarded as "the guardian" of the concept (Richter 2010), the intention of DII is to undertake further steps towards the implementation of the Desertec concept, such as the establishment of suitable framework conditions, the conduction of feasibility studies and the development of project plans (DII 2011).

During 2010 the DII enhanced its network: Currently, the DII consists of 18 shareholders and 32 associated

partners from 13 different countries (DII 2010, 1-2).² According to the Desertec Foundation, a call for tenders for the first Desertec reference project located in Morocco will start at the end of 2012, while the construction could start in 2015 (Gropp 2011). This timeframe is also supported by the DII. The DII stated that the framework conditions, which “[...] will allow the Desertec vision to be realized” should be created by the end of 2012 (DII 2011).

As another complimentary approach, the MEDGRID initiative, formerly known as “Transgreen”, should be mentioned. Strongly supported by the French government and established in November 2010, MEDGRID aims to connect the EU and the MENA-region with five underwater direct current interconnections. Already joined by 20 companies, the initiative is committed to design a “Mediterranean Grid Master Plan” for 2020 and promote a regulatory and institutional framework (De Montravel 2010, 8-10.). Furthermore, it has been stated that Desertec and MEDGRID, which have overlapping goals, but different main focuses, complement one another (Handelsblatt 2010) and, therefore, will work together through the exchange of information (De Montravel 2010, 16).

1.1.3 Political processes and stimulating framework conditions

In addition to the mostly private and civil society driven approach of the DII and Desertec Foundation, a number of complimentary political processes have evolved on the EU -MENA level. These processes could boost the

deployment of renewable energy sources and, in particular, CSP in the MENA-region.

The Union for the Mediterranean (UfM), which was formed in July 2008, builds on the Barcelona Process and has currently 43 member states. Within the UfM different regional initiatives are proposed to enhance regional cooperation. Such initiatives include the pollution cleanup of the Mediterranean, maritime and land highways, civil protection, higher education and research, the Mediterranean business development initiative and the Mediterranean Solar Plan (MSP) (Hesse 2009, 53 and 59). Assumed to be one of the most advanced initiatives within the UfM, the MSP aims towards energy cooperation: The goal of the MSP is the installation of 20GW power plant capacity from renewable energy sources³ in the MENA-region by 2020. However, the whole process – influenced by political framework conditions – has stalled and has shown little advancement.

Furthermore, the EU’s so-called ‘20-20-20’-goal, adopted due to Directive 2009/28/EC⁴ in April 2009, could have important implications for the deployment of renewable energy sources in the MENA-region. The ‘20-20-20’ goal foresees the EU to a) reduce its greenhouse gas emissions by 20% until 2020 (compared to 1990), b) increase the share of renewable energy to 20% by 2020 and c) reduce its energy consumption by 20% until 2020. However, especially important for the deployment of renewable energy sources in the MENA-region is Article 9 of the directive, which allows for electricity imports from countries that are not members of the EU

² DII shareholders: ABB, Abengoa Solar, Cevital, DESERTEC Foundation, Deutsche Bank, Enel Green Power, E.ON Flagsol, HSH Nordbank, Munich Re, M+W Group, NAREVA Holding, Red Eléctrica de España, RWE Saint-Gobain Solar, SCHOTT Solar, Siemens, and TERNA (Italy)

DII associated partners: 3M, AGC, Audi, BASF, BearingPoint, Bilfinger Berger, Bosch Rexroth, Commerzbank, Concentrix Solar, Conergy, Deloitte, Evonik Industries, FCC Energía, First Solar, FLABEG, Fraunhofer Gesellschaft, GL GARRAD HASSAN, HSBC, IBM, ILF Consulting Engineers, Italgen, KAEPER, Lahmeyer International Maurisolaire, Max-Planck-Gesellschaft, Morgan Stanley, NUR ENERGIE, OMV, Schoeller Renewables, SMA Solar Technology, TERNA ENERGY (Greece), and TÜV SÜD

³ 10-12GW from CSP, 5-6GW from wind power and 3-4GW from PV; costs: approximately EUR 80 billion (Richter et al. 2008, 67; Werenfels and Westphal 2010, 25)

⁴ DIRECTIVE 2009/28/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC

(so-called “third countries”). Solar electricity imports based on CSP plants from the MENA-region to the EU made possible by Article 9⁵ of the directive, therefore, could help the EU member countries to fulfil their renewable energy obligations.⁶

Against the background of growing energy needs due to population and economic growth, shrinking energy reserves and already existing electricity and fuel shortages, different MENA-countries made strong commitments to support renewable energy sources within their national policies (Erdle 2010, 21). The motives for MENA-countries to emphasize renewable energy policies, however, may vary: For oil and gas importing countries the enhancement of renewable energy resources on their own territory could improve energy security and economic stability, while energy exporting countries could be freeing-up oil and gas resources for more valued added utilization (CTF 2009, 5).

To be more specific, the Moroccan Solar Plan as part of the National Energy Strategy, for example, aims towards 42% renewable energy use by 2020 (CTF 2009, 48-50). On the institutional level, the Moroccan government already took important steps towards the realization of renewable energy sources in its energy mix: In 2008, it created a National Energy Fund aimed towards the support of projects in the field of renewable energy and energy efficiency. Additionally, the Moroccan Agency for Solar Energy (MASEN) is responsible for the implementation of large-scale solar projects (Erdle 2010, 28). As another example, the Tunisian government established a National Solar Plan in 2009. The National Solar Plan of Tunisia lists 40 projects⁷ in the field of energy efficiency and renewable energy.

Stimulating economies of scale for CSP construction and developing “[...] a critical mass of CSP plants in the [MENA] region [...]” (CTF 2010, 2) by co-financing nine CSP plants and two transmission projects is the goal of the MENA CSP Scale-Up Investment Plan (MENA CSP IP) (CTF 2010, 1). The MENA CSP IP is part of the Clean Technology Fund (CTF), which seeks the promotion of low carbon technologies (CIF, 2011). Starting with a 500MW project in Ouarzazate, Morocco, followed by projects in Egypt, Tunisia and Algeria, the MENA CSP IP stated benefits⁸ of these projects similar to those of the Desertec concept, while emphasizing the rather regional character of this supporting scheme.

The large-scale deployment of CSP plants could also benefit from the recent Cancun agreements in 2010 – particularly from the Green Climate Fund. The Green Climate Fund, which “[...] may come from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources” (UNFCCC, 2011, p17), has a budget of \$ 100 billion a year of climate funding for developing countries from 2020 onwards. The Green Climate Fund could include different mechanisms, such as, “[...] auctioning carbon credits and levies on international aviation and shipping” (The World Bank 2011, 29), which in turn could have positive impacts on the deployment of renewable energy resources. An overview of CSP projects in the MENA-region, whether or not supported by the MENA CSP IP, is given in Table 1.

1.2 Political context

In 2011 the MENA-region has reached a critical turning point: High demographic growth, climate change and

⁵ Electricity imports from a third country are bound to three conditions: 1.) Electricity has to be physically imported and consumed in the European Union. 2.) The electricity imported has to be produced by a power plant in operation after June, 25 2009. 3.) The same project cannot benefit from a support scheme of a third country other than investment aid (CTF 2010, 25-26).

⁶ For more detailed information regarding the international context of the Desertec concept please see Erdle (2010, 13).

⁷ Investment volume: EUR 2 billion; 17 solar energy projects, 3 wind projects, 7 biomass projects, 7 energy efficiency projects (Erdle 2010, 32 Erdle 2010, 13-15).

⁸ Benefits mentioned by the MENA CSP IP are the reduction of CO₂ emissions, reduced dependency on fossil fuels, a reliable electricity supply, export revenues, the promotion of technology transfer and the creation of local employment (CTF 2011, 1).

Table 1: Planned and currently constructed CSP projects in the MENA-region

Country	Name	Location	Developer	MW Capacity	Solar MW Capacity	Technology	Status	Part of MENA CSP IP
Algeria	Hassi-R'mel II	Hassi-R'mel	Not assigned	400	70	Parabolic Trough	Planning	x
Algeria	Hassi-R'mel ISCC	Hassi-R'mel	Abengoa	150	25	Parabolic Trough	Under Construction	
Algeria	Meghaïer		Not assigned	400	75	Parabolic Trough	Planning	x
Algeria	Naâma		Not assigned	400	70	Parabolic Trough	Planning	x
Egypt	Kom Ombo Project	North of Aswan, Nile	Not assigned		70	Parabolic Trough	Planning	x
Egypt	Kuraymat ISCC	Kuraymat	Iberdrola-Mitsui	150	40	Parabolic Trough	Under Construction	
Egypt	Marsa Alam	Hurghada, Red Sea	Not assigned		30	Parabolic Trough	Planning	x
Iran	Yazd ISCC	Luth Desert	Not known	430	67	Parabolic Trough	Planning	
Israel	Ashalim	Ashalim, Israel	Israel Electric Company		190	Parabolic Trough	Planning	
Israel	Negev Desert	Negev Desert	Not known		250	Parabolic Trough	Planning	
Jordan	Joan1	Ma'am, Jordan	MENA Cleantech		100	Linear Fresnel	Planning	x
Morocco	Ain-Ben-Mathar ISCC	Ain-Ben-Mathar	Abengoa	470	30	Parabolic Trough	Under Construction	
Morocco	Ain-Ben-Mathar ISCC 2	Ain-Ben-Mathar	ONE		125	Parabolic Trough	Planning	x
Morocco	Ouarzazate Project	Tamez Chitene	ONE		100	Parabolic Trough	Planning	x
Morocco	Tan Tan CSP-Desal Project	Tan Tan	Not assigned		50	Undecided	Planning	x
Tunisia	Elmed CSP – Project		Not assigned	1200	100	Parabolic Trough	Planning	x
Tunisia	IPP-CSP Project	location to be determined	Not assigned		100	Parabolic Trough	Planning	x
UAE	Shams 1	UAW	Abengoa -Total JV		100	Parabolic Trough	Under construction	

Source: according to Ctf 2009; Csp today 2011

unsustainable agricultural production have led to a significant increase of food imports and energy demands in many Arab countries. The combined impacts of these trends increasingly hamper the socio-economic development of most of the MENA-countries at the same time as the hydrocarbon-backbone is reaching its boundaries of expansion leaving them highly vulnerable to exogenous price-shocks. In an era of rising costs for fossil fuels (IEA 2011) and the prices of many staple food commodities being on a straight upward trajectory (FAO 2011a), balancing national accounts, providing citizens with enough goods to fulfil their needs and creating new sources of employment are becoming a difficult task for many countries in the MENA-region – especially for the non-oil producing countries.

According to the FAO Food Price Index (FAO 2011b) global food prices are currently higher than ever before and expected to rise even higher as the world is reaching its environmental constraints due to climate change and peak-oil. Rooted in the failure to create attractive climates for investments unemployment rates in many Arab countries are the highest in the world, particularly among the youth (ILO 2011). The uprising protest movements and cataclysmic changes across the MENA-region certainly have multiple origins, but the recent increase in food and oil prices accompanied by poor employment opportunities have been important triggers.

Together with the Fukushima nuclear crisis and along with shifting balances of power, also fueled by the socio-economic inequalities as well as the lack of access, accountability and opportunity in the Arab world, the conventional energy paradigm particularly in the EU but also in some of the MENA-countries (e.g., Jordan) and the political paradigm in the MENA-region now seem to have critically lost ground. Gone is the age of ever abundant and secure fossil fuels and severely weakened seems to be the dominance of several unpredictable authoritarian regimes in the region.

Against this backdrop of change the stage could be set to move towards a sustainable energy future and new democratic structures in the MENA-region. This could offer a unique opportunity for state organs, civil soci-

ety and businesses to work collectively on innovative solutions in order to reshape society in the Arab world and tackle the major challenges ahead. Although, the current changes can be related to higher uncertainties in the short term, the timing for the large-scale deployment of solar technologies could not be better but also more critical.

On the one hand, despite the present political and economic uncertainty, people in the Arab world are filled with new aspirations and hope. Notwithstanding that in many oil-producing countries, such as Syria, Libya, Yemen, and Bahrain, social upheavals have deteriorated into civil war, or regime-led violence, this new situation could turn the region's young demographics from a potential liability into a fertile business environment. This could lead to new economic heights – especially in countries that do not live off oil and have restored some stability, e.g., Tunisia and Egypt. Such a transition, however, very much depends on whether the new leaders will live up to the high expectations of their people – and thus, especially on views, needs, strengths, livelihoods and legitimate claims of their citizens.

On the other hand, however, recently expanded subsidy programs for hydrocarbon energies as well as existing plans to build civilian nuclear power reactors both in net energy importing and exporting MENA-countries may hamper the transition to a renewable energy regime as they prolong the replacement of increasingly outdated power plants or boost the construction of new ones (Ruchser 2011, 2).

In this context, there is an urgent need for the Desertec vision to be represented not only as an energy infrastructure concept, but as a valuable alternative to the shrinking endowments of natural assets in order to promote sustainable human development and political stability through, e.g., capacity building, new infrastructure and foreign investments.

Thus, as entrenched monopolies and patronage linked to old regimes unwound in the wake of the new democratic movements in the region, it will be crucial for the success of Desertec to collectively develop its de-

sign along a framework that corresponds to the regional democratic zeitgeist.

1.3 Purpose and analytical structure of the paper

The human development outcomes of Desertec are determined by the design of the concept, the variables associated with its implementation and the context in which it will be implemented. In this study, human development is defined according to a definition by UNDP in 2010:

“Human Development aims to expand people’s freedoms – the worthwhile capabilities people value – and to empower people to engage actively in development processes, on a shared planet. And it seeks to do so in ways that appropriately advance equity, efficiency, sustainability and other key principles“ (UNDP 2010, 40).

In the context of this paper and in the views of the authors, issues that are central to human development are furthermore: adequate standard of living, health, employment, water, food, land, the environment, education and income.

Despite its fascinating vision, without addressing the Desertec concept’s human development dimension, it is likely to offer only a few trickle-down effects and instead generate numerous adverse impacts – particularly on the most vulnerable groups of society. At the local level of the MENA-region Desertec should therefore be approached in a much wider setting and as an integrated development concept, which gives opportunity, on the one hand, to strengthen the sustainability of the people’s livelihoods and human rights, and, on the other hand, to emphasize a human development dimension.

Notwithstanding some discussions about the importance of linking the Desertec concept with human development and sustainability dimensions (Erdle 2010, 42; Dir 2005, DII 2011b) a comprehensive framework based on the socio-cultural needs and strengths of the people liv-

ing in the target region in order to improve its sustainable human development outcomes is still missing.

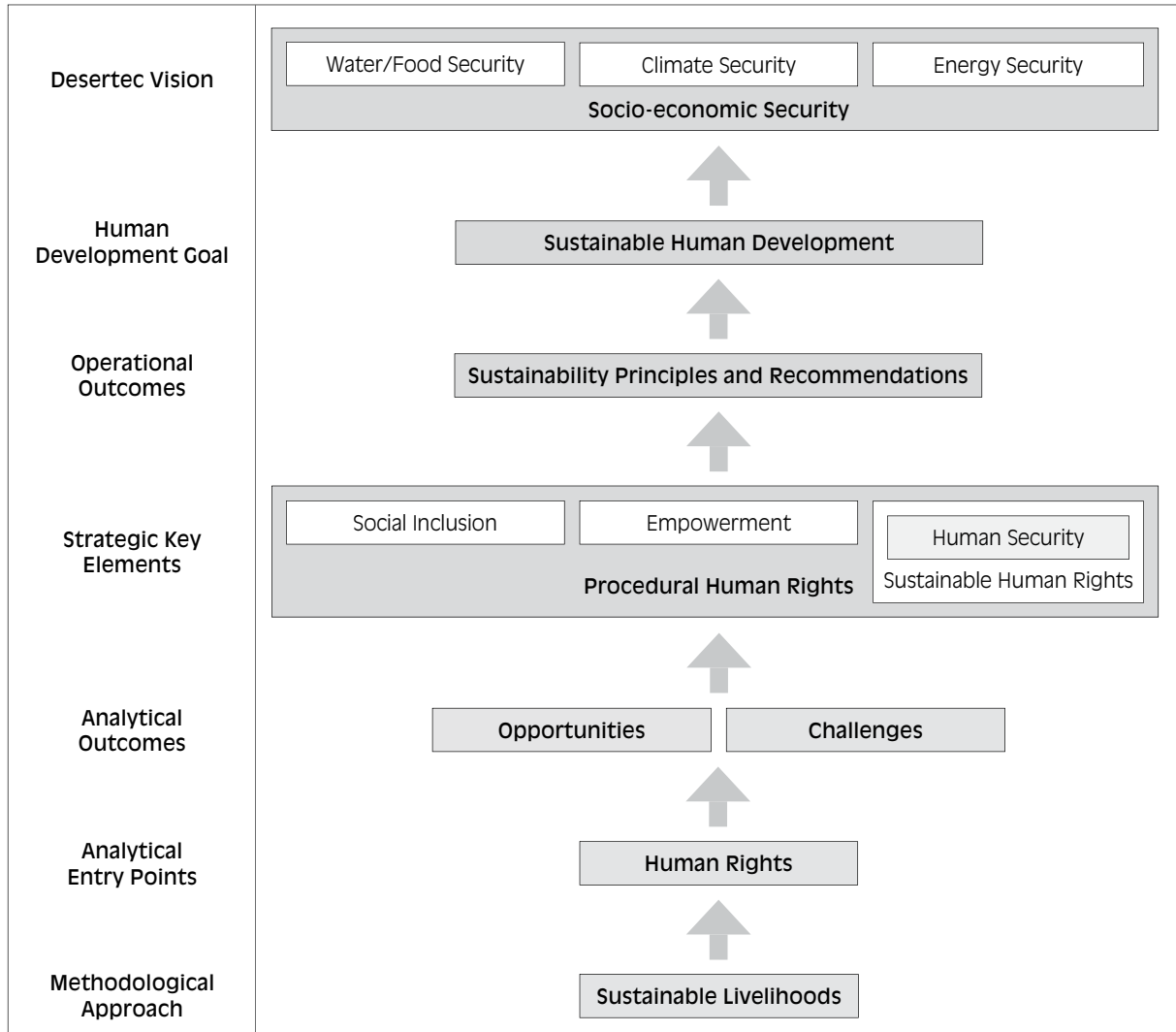
Therefore, rather than just considering its technological and physical dimensions, this study’s purpose is to integrate sustainable livelihoods and human rights into the Desertec concept in order to emphasize sustainable human development issues at the local scale in the MENA-region. Following this purpose an analytical, process-driven framework (see Figure 2) has been developed, which provides a needs-oriented, bottom-up guidance for the Desertec design and implementation. In this regard the analytical structure of the analysis can be divided into four parts:

- Identification of livelihood-related human rights and livelihood assets potentially being affected by the Desertec concept;
- Analysis and assessment of the potential opportunities and challenges Desertec could create for sustainable human development at the local level in the MENA-region;
- Exploration of ways how Desertec could contribute to sustainable human development in the MENA-region by increasing its positive effects and reducing its negative impacts;
- Development of a first set of sustainability principles and recommendations to give guidance on improved decision-making processes.

In order to identify which human rights and sustainable livelihood assets of the people living in the MENA-region could be affected by Desertec, this study draws upon a human rights-based approach implemented into the sustainable livelihood framework.

Based on the identification of affected human rights and sustainable livelihood assets the integration of human rights into the sustainable livelihood framework then provides valuable entry points for both a comprehensive analysis and assessment of the distribution of the concept’s potential livelihood opportunities and chal-

Figure 2: Analytical structure of the paper



Source: Illustration by the authors following World Bank 2003, 3

lenges across geographical and social space. The focus on human rights tangent to Desertec thereby shifts the former perception of its idea as a technology and energy security-oriented concept towards a more people-centered assessment based on the views, strengths, needs, livelihoods and legitimate claims of the people in the MENA-countries.

Against the analytical background of the livelihood-human-rights-analysis the strategic and process-driven key elements of social inclusion, empowerment and human security – represented by the interrelated procedural

and substantial human rights – are then defined in order to increase the potential positive effects and reduce the negative impacts of Desertec at the local level.

In the last step the results of the analytical part are then transposed into a first set of sustainability principles and recommendations that should give guidance on improved decision-making processes and pursue a better realization of the Desertec vision in the MENA-region. However, these principles and recommendations should not be perceived as definite. Instead they provide conceptual suggestions and an inspirational starting point

for dialogue among the main target groups of this paper – political stakeholders (e.g., governments), civil society (e.g., NGOs) and industrial project planners working in national or international institutional settings – on including empirically based and socially focused adjustments to the estimates of the project's benefits and costs.

2 Analysis

2.1 Methodological approach and analytical entry points: The sustainable livelihood framework and human rights-based approach

Based on the conceptual framework of sustainable livelihoods analysis, the integration of human rights into the methodological approach provides valuable entry points in order to analyze and assess how the Desertec concept could affect sustainable human development at the local level in the MENA-region.

2.1.1 Why adopt a human rights-based approach to Desertec?

Human rights are the minimum standards that human beings whether as individuals, groups or communities require to live in freedom, justice, peace and dignity. They are inherent to all people, enshrined in the Universal Declaration of Human Rights (UDHR) and thus acknowledged by every member state of the UN. Whereas the rather normative human rights principles and standards within the UDHR do not create any legally binding obligations on the UN member states, they had a profound influence on the development of several international treaties, covenants and conventions.

Since these human rights instruments are legally binding under international law and at the national level of those states that have subscribed to them, they form the lawful backbone of the human rights-based approach. Despite the reluctance of some Arab states to accept some of the main human rights principles by arguing for exceptions to be made on cultural and religious grounds, most MENA-countries have acceded to the seven major UN treaties on human rights (Arab human rights 2011) as listed in chapter 2.2.2.

Based upon these legally binding human rights instruments, rights can be claimed at courts and tribunals to strengthen the position of the local people and to further the human rights-based basic needs of the poor

and marginalized in decision-making processes. Victims of human rights violations can claim their rights through different procedures that cover legal qualities, from arbitration to judicial procedures and which entitle them to adequate reparations – including restitution, compensation, satisfaction and guarantees of non-repetition.

In this context a human rights-based approach to Desertec offers an internationally acknowledged, legally binding and practice-oriented frame of reference that should complement the technocratic, regulatory and economic perspectives on the Desertec concept in order to emphasize sustainable human development issues at the local level in the MENA-region. Guided by the UDHR and its accompanying treaties and in line with the conceptual “UN common understanding on a human rights-based approach” (UNDG 2003, 1) the human rights-based approach to Desertec is based on the following three principles:

- Furthering the realization of human rights and use of the human rights treaties as reference;
- Integration of the human rights principles: indivisibility and interdependence, equality and non-discrimination, participation and social inclusion, accountability and the rule of law;
- Development of the capacities of duty bearers to respect, protect and fulfil human rights as well as providing capacities of the corresponding rights holders to claim their rights (UNDG 2003, 1).

Based on these principles, integrating the human rights dimension into all phases of the Desertec concept (planning, implementation, operation and evaluation) as its objectives as well as into its development process leads to a more holistic design of the concept’s decision-making and adds value to it for a number of reasons:

Attention to the poor and marginalized people: Poor and marginalized people are often left out in important decision-making processes and therefore suffer disproportionately from discrimination and livelihood

depletion. A human rights-based approach, however, directs attention to the needs and the vulnerability context of the poor and marginalized people affected by Desertec, e.g., migrant domestic workers, stateless nomads or women and emphasizes their inclusion and empowerment within the decision-making process.

The inter-dependence of human rights and sustainable human development: Human rights and sustainable human development are interdependent and mutually reinforcing. Sustainable livelihoods and, thus, sustainable human development can only be achieved when human rights, e.g., the right to health, food, water or work, are ensured and vice versa (see: Table 4).

Helping achieve the Millennium Development Goals (MDGs): Many MDGs are based upon human rights principles and standards. Due to the multiple overlaps between human rights and the MDGs, a human rights-based approach to Desertec, thus, has more direct benefits for poverty reduction, health, water and food security as well as gender equality (see: Table 6).

Addressing conflicting rights and interests: A human rights-based approach to Desertec establishes the existence and furthers the relationship of human rights claims and corresponding obligations as it legitimates the claims of the people as rights holders and contributes to the development of the capacities of duty bearers to meet their obligations effectively. In doing so, this brings potentially conflicting interests and rights into the open and thereby resolves them by mitigating negative impacts (challenges) and promoting positive effects (opportunities) on sustainable human development (see: Table 7).

Preventing elite capture: With its focus on the social inclusion and empowerment of poor and marginalized people the human rights-based approach to Desertec could transfer the opportunities as well as the challenges more equitably across the social space and thereby prevent the elites that are in many MENA-countries linked to old regimes, patronage and corruption from capturing all the benefits.

Effectiveness and sustainability: Positive effects of the Desertec concept in the MENA-region as well as its acceptance among the civil society are more likely to be high when the rights holders are included into the decision-making process as informed and active participants instead of passive recipients. This is especially important in light of the social upheavals in the region (UNDP 2005, 10).

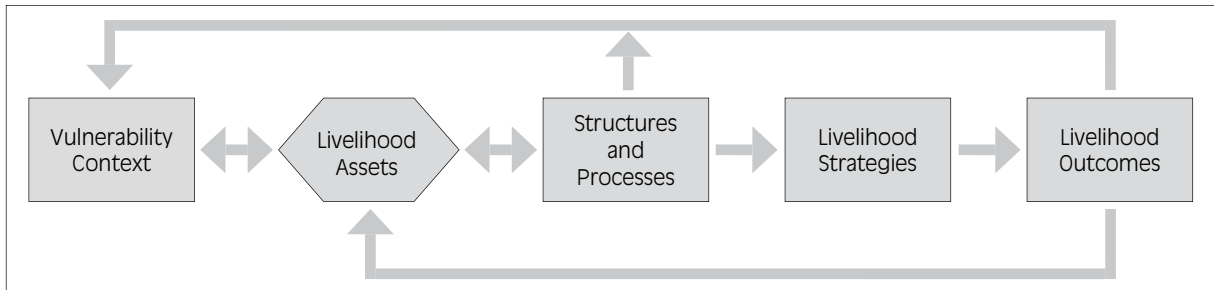
Against this background a human rights-based approach to Desertec can be used to serve as an inspirational platform upon which a more sustainable Desertec design can be built and human rights be facilitated.

2.1.2 Why adopt the sustainable livelihood framework to Desertec?

The sustainable livelihood framework has gained increasing acceptance in development policy and practices since it was introduced in the 1990s (Chambers and Conway 1992, 5). Its key objective is to strengthen people's livelihoods by promoting their assets to cope with and recover from socio-environmental stress and shocks and, thus, improving their living situation and well-being. Traditionally it has been used to good effect in agricultural and rural livelihood projects, in order to contribute to poverty reduction and sustainable human development. In the context of Desertec and in line with the main purpose of this paper, the framework serves as an ideal methodological approach to contribute valuable insights to the planning process of Desertec.

The sustainable livelihood framework is founded on the perspective that people are operating in a specific context of vulnerability, which forms the external environment of their livelihoods. Within the vulnerability context, they have access to certain livelihood assets that gain their value through the prevailing institutional structures and processes. All three components influence the livelihood strategies of the people in order to pursue beneficial livelihood outcomes. In turn the livelihood outcomes give feedback to the bundle of livelihood assets and impact on the external vulnerability context (DFID 1999, 1) (see Figure 3).

Figure 3: The sustainable livelihood framework



The vulnerability context can be regarded as the starting point of the sustainable livelihood framework (DFID 1999, 3).

Vulnerability context: Physical (environmental change), social (adverse social processes), economical (income divide) and political (political power processes) trends, seasonality and shocks that impact on the people's livelihood situation.

Within the vulnerability context people require a range of certain livelihood assets to achieve positive livelihood outcomes for both the present and the future. In its simplest form, the framework identifies five core asset categories upon which livelihoods are built:

- **Human capital:** Skills, knowledge, capacity to work and good health to pursue different livelihood strategies.
- **Social capital:** Networks, relationships of trust, collective representation and informal support which people build their livelihood strategies and objectives on.
- **Natural capital:** Natural resource stocks and environmental services, e.g., land, water and aquatic resources, air, forests.
- **Physical capital:** Basic infrastructure and goods needed to support livelihoods.
- **Financial capital:** Financial resources needed to achieve livelihood objectives in forms of capital stocks and money inflows.

The abundance of just one form of livelihood assets is very unlikely to lead to sustainable livelihood outcomes. In regard to Desertec, the building of a large-scale energy infrastructure – physical capital – will neither lead automatically to a sustainable endowment of other livelihood assets, nor does it carry any intrinsic guarantee to ensure sustainable human development. However, social capital may be the first asset in the sequence of the assets bundle that could lead to sustainable livelihoods. By strengthening social capital through empowerment and social inclusion, social capital can stimulate the accumulation of other assets and support the diversification of sustainable livelihood strategies (Wilkinson 2002, 6 and 12) .

Despite different roots, both the human rights-based approach and the sustainable livelihood framework are mutually overlapping in their founding principles. They both are holistic, people-centered and seek to empower marginalized groups. Information, participation, equity and accountability are essential components of both approaches to reduce vulnerabilities, increase livelihood assets and influence institutional structures and processes: In the human rights-based approach to empower the rights holders to claim and the duty bearers to fulfil livelihood-related human rights, and in the sustainable livelihood framework to increase their livelihood assets and develop livelihood strategies in order to cope with their vulnerability context. Supporting people to claim and fulfil livelihood-related human rights as well as strengthening certain livelihood assets are both equally important to achieve sustainable human development (Odi 2007, 5). However, in order to analyze the positive effects and negative impacts Desertec could have

on the livelihood outcomes of the people through a human rights lens, it is important to expand the rather descriptive sustainable livelihood framework with another more dynamic and operational livelihood asset. The sustainability of livelihoods is closely knitted to legally binding and, thus, politically defensible human rights. Therefore the notion of political capital as another livelihood asset is critical to analyze the links between the human rights holders at the local-level and the structures and processes represented by the corresponding duty bearers at an operational policy level (Odi 2000, 21). Political capital can be understood as a “gatekeeper asset permitting or preventing the accumulation of other assets upon which” the sustainability of livelihoods depends. Political capital determines the level of access to decision-making as well as the ability of the rights holders to influence their livelihood strategies and their vulnerability to shocks and stresses (Dfid 1998, 78).

Political capital: The resources used to influence and participate in political decision making, e.g., information and participation.

By adding political capital to the bundle of livelihood assets the framework acknowledges that the robustness of livelihoods is not only constrained by its specific vulnerability context and the bundle of livelihood assets, but on the prevailing social and institutional environment of structures and processes which influence the asset endowments and its entitlements (McHugh 2008, 5).

Structures and processes: Private and public institutions and organizations as well as their policies, laws and legislations that determine the access to livelihood assets and, thus, directly impact on people’s livelihoods.

From a human rights-based perspective these structures and processes can also be defined as duty bearers and their channels to fulfil their human rights obligations. The link between structures and processes with the livelihood assets respectively between the duty bearers and the rights holders through “the gate” of political capital can substantially reinforce or deplete the people’s livelihood situation.

Livelihood outcomes: The achievement of certain livelihood strategies that impact the livelihood assets as well as the vulnerability context.

A strong connection leads to positive livelihood outcomes that increase the endowments of livelihood assets for individuals, households, communities and social groups. On the negative side, weak or counteracting interlinkages between them debilitate the people’s ability to cope with their surrounding vulnerability context (DFID 1999, 6).

Neither the human rights-based approach nor the sustainable livelihood framework is intended to illustrate an exact representation of reality in a specific setting; combined they provide a valuable entry point at three levels:

- Firstly, to identify which human rights have to be fulfilled in order to enable people to draw upon their livelihood assets.
- Secondly, to analyze and assess how the Desertec concept could affect these livelihood-related human rights.
- And thirdly, to explore how the Desertec concept could promote livelihood sustainability and human security through social inclusion and empowerment by enhancing procedural human rights at the local level in the project area.

2.1.3 The external vulnerability context in the MENA-region

As part of the sustainable livelihood framework, assessing the external vulnerability context of the concept’s target region involves an analysis of exogenous shocks, seasonalities and long-term stress to which the people’s livelihoods are exposed to and by which the availability of livelihood assets is fundamentally affected. In the MENA-region the external vulnerability context can be divided into two classes: environmental and socio-political. Today the MENA-region already experiences significant negative environmental trends. For example: Of the 20 nations worldwide with internal renewable freshwater availability below 1000 m³ per capita, 15 are lo-

Table 2: The environmental vulnerability context in the MENA-countries using the example of Ouarzazate/Morocco

Issue	Description
Climate change	The Drâa basin belongs to the ten most arid catchments of the world and has suffered regularly from long lasting droughts in the past (Ravenga 1998, 2-29). In the future, higher rainfall variabilities with a 20% decrease in precipitation causing a drastic decline in surface discharge and water reservoir recharge, high evaporation rates with more pronounced droughts and floods are expected to occur in the region (IPCC 2007, 443).
Land degradation	Adverse climate conditions and population growth have put high pressures on the soils in the region and led to erosion, salinity and declined soil fertility (Klose 2009, iii).
Sedimentation	The silting up of the region's most important dam due to soil erosion caused by over-grazing, poor farming practices and climate change makes the dam capacity insufficient to meet the water demands of the people (De Jong, C. 2006, 5 and Heidecke ,C. et al 2008, 172).
Water quality	High levels of salinity in the groundwater are adversely affecting the water quality in the Drâa basin around Ouarzazate especially during the summer (UNESCO 2005).
Water scarcity and availability, water conflicts	The fast growing population in the region puts pressure on the amount and availability of drinking water. Consumption of drinking water competes directly with the water usage for agricultural and industrial production causing the exploitation of groundwater reservoirs and falling water tables. Especially the people living in the rural areas of Ouarzazate are most affected by this stress (Heidecke et al. 2008, 172 and UNESCO 2005).

cated in MENA (Brooks 2007, 34). The whole water deficit in the MENA-region is expected to grow from 60 billion m³ per year today to 150 billion m³ in the year 2050.

Furthermore, the main energy sources in the region are fossil fuels, particularly oil and natural gas (Al-Widyan and Al-Muhtaseb 2009, 179). However, those fossil resources are unequally distributed among MENA-countries. One has to distinguish between resource-rich countries (as in Algeria or Libya) and resource-scarce countries (like Tunisia and Morocco), which are highly dependent on energy imports (Werenfels 2009, 8). The combustion of fossil fuels leads to anthropogenic climatic change due to increasing greenhouse gas (GHG)-emissions in the atmosphere. If no measures are taken, the MENA-region will increasingly cause GHG-emissions, and, at the same time, may suffer from prolonged droughts, decreasing total precipitation and desertifica-

tion due to climatic change (Varis and Abu-Zeid 2009, 517; Brauch 2006, 76).

Socio-political trends, such as population growth, will further increase the pressure on freshwater resources and increase the demand for energy: The population of North Africa⁹ is expected to grow from 213 million in 2010 to 321 million in 2050 (UN 2008), while the urban population in the region is predicted to double by 2030 (Varis and Abu-Zeid 2009, 510). At the same time, electricity consumption will increase five times to around 3000 TWh/year (Desertec Foundation 2009b, 20 and 26-28). Furthermore, recent events in countries like Egypt, Tunisia and Libya have clearly shown a growing potential for conflicts in the region.

Coupling socio-political trends, such as demographics, notably the already existing problem of high unemployment rates, especially for young people,¹⁰ and increasing

⁹ Northern Africa includes the following countries by definition of the UN: Algeria Egypt Libyan Arab Jamahiriya Morocco Sudan Tunisia Western Sahara

¹⁰ example, North Africa's overall unemployment rate has reached 10.5% in 2009 (women: 15.6%; youth: 24.7%) (ILO 2010, 27).

Table 3: The social-political vulnerability context in the MENA-countries using the example of Ouarzazate/Morocco

Issue	Description
Traditional customs and habits	Traditional customs and institutions are deeply manifested in the social structure of the region and in case of environmental shocks lead to the discrimination of marginalized groups and denied water entitlements, e.g., during droughts (Schlütter 2006, 171).
Human development	Morocco is characterized as a nation of medium human development (HDI of 0.56). But, especially in the rural areas the HDI lies well below the national average. As 75% of the Moroccan population lives in rural areas, the Drâa basin can be characterized as a marginal zone regarding the human development. The HDI of Arab states as a region rates with an average of 0.59 today, placing Morocco below the regional average (UNDP 2010).
Poverty and education	Poverty and illiteracy remain located in rural areas. 15% of the Moroccan population lives below the poverty line. The country's illiteracy rate reveals sharp gaps in education, both in terms of gender and location; while country-wide illiteracy rates are estimated at 60% among women and 35% among men, the female illiteracy rate in rural areas is estimated at 90% (CIA 2010).
Demographic structure	The population in Morocco is very young. The median age in Morocco is estimated to be 26.5 years with higher rates of young people in the rural areas (CIA 2010).
Unemployment	The unemployment rate in Morocco is very high especially among young people in rural areas (CIA 2010). In the Ouarzazate region 61% of the rural population work in the agricultural sector (Ouarzazate 2010).
Migration	The region suffers from a wide migration of people rushing from the countryside into the cities. In the future, with declining water availability and further weakened livelihoods in rural areas this trend is expected to worsen creating further critical social effects due to new claims of public arable land to be private or increasing urbanization (UNESCO 2007).
Elites	The distribution of water and land entitlements is mainly based on the interests of influential elites and political-economic interest (Schlütter 2006, 118).
Marginalization of the rural area	Public investments in infrastructure projects focus primarily on the urban and touristic development of Ouarzazate. Rural areas are not only being left out but also discriminated against the compulsory purchase for purposes of public utility and resettlement (Schlütter 2006, 141).
Gender inequity	Moroccan society is heavily marked by social and economic inequality between men and women – particularly in rural areas. Women are frequently unable to exercise human rights, such as the right to education, to employment, to property and to a life free of violence and coercion. Until recently women were also largely excluded from political decision-making processes (Schlütter 2006, 239).
Social divide	Entitlements and endowments over land and water between rural and urban as well as between landowner and landless are unevenly distributed in the social space of the project's region discriminating the poor and landless and leading to social tensions (Schlütter 2006, 239).
Civil conflict	Increasing competition over water-land endowments and entitlements as well as the discontent over former resettlements and compensations have lead to numerous demonstrations and conflicts between the local government and the affected people (Schlütter 2006, 239).

environmental pressures profoundly shape the external vulnerability context in the MENA-region and significantly affect the availability of livelihood assets.

As an example of the external vulnerability context in the MENA-region, these two classes are specified in Table 2 and Table 3 for a planned CSP project in the

Southeast of Morocco, named Ouarzazate. Despite the 500MW Ouarzazate CSP plant not being directly related to Desertec, it represents the first of its kind to be developed under the World Bank's CSP investment plan for the development of CSP in the MENA-region and currently constitutes the largest proposed CSP plant in the world. It is part of the Moroccan Solar Plan, which

calls for the commissioning of five CSP plants between 2015 and 2020 with a total capacity of 2000MW, accounting for around 40% of Morocco's total installed power generation capacity (Reuters 2009).

The examples given in both tables however, do not represent a complete picture of the comprehensive external vulnerability context that neither the Ouarzazate region nor the MENA-countries in general are dictated by. Instead the listed issues are examples of some of the prevailing threats to the livelihood situation in the region and can serve as a reference for other CSP projects.

2.2 Identification of livelihood-related human rights being affected by the Desertec concept

The objective of the human rights-based approach to Desertec for achieving the promotion of livelihood-related human rights as well as sustainable livelihoods for the local people within the concept's bounds of capabilities draws upon three elements.

The first element comprises the human rights treaties that provide the justification for people to claim their substantial human rights to a secure and dignified livelihood standard (see: chapter 2.2.1). The second element identifies the human rights holders and their corresponding duty bearers (see: chapter 2.2.2). And the third element analyzes procedural human rights that interlink the first two elements and enable to safeguard the integration of substantial human rights into the Desertec design (see: chapter 2.2.3).

2.2.1 What substantial human rights are affected by the Desertec concept?

For the identification of substantial livelihood-related human rights that are tangent to Desertec, the international human rights framework containing civil and political, economic and social as well as environmental and developmental human rights has to be analyzed. In this context, references are taken from the Universal Declaration of Human Rights (UDHR) and its accompanying "hard law" and therefore legally binding treaties:

- the International Covenant on Civil and Political Rights (ICCPR);
- the International Covenant on Economic, Social and Cultural Rights (ICESCR);
- the International Convention on the Elimination of All Forms of Racial Discrimination (ICERD);
- the Convention Against Torture and Other Cruel, Inhuman and Degrading Treatment or Punishment (CAT);
- the Convention on the Rights of the Child (CRC);
- the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW);
- the International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families (ICMWC) (OHCHR);
- the Convention on indigenous and Tribal Peoples in Independent Countries (ILO No. 169) by the International Labor Organization (ILO).

Additionally, non-binding "soft law" declarations such as the "Draft Declaration of Principles on Human Rights and the Environment (DDPHRE)" (UNHR, 1994), the "Declaration on the Rights of Indigenous Peoples (DRIP)" (UN, 2007) and the "Rio Declaration on Environment and Development (Rio Declaration)" (UNEP, 1992) are being included into the analysis.

Although the latter three are not directly legally binding and, thus, not directly enforceable in international courts, they are, nevertheless, globally recognized. They all fulfil a normative function with the expectation that their principles and standards will be promoted internationally by the member states of the UN.

Based upon these treaties, and guided by the human rights-based approach implemented into the sustainable livelihood framework, the substantial human rights relevant in the Desertec context can be distinguished in

Table 4: Substantial human rights affected by Desertec at the local level in the MENA-region with their reference points to the sustainable livelihood assets

	Human Capital	Natural Capital	Financial Capital	Physical Capital	Political Capital	Social Capital
Right to adequate standard of living and right to life (Rio 5, UDHR 25, ICESCR 11 and ICCPR 6)	Standard of living		Productivity and liquidity	Energy		Traditional practices and cultural institutions
Right to development and scientific progress (UDHR 27, Rio Declaration 3, ICESCR 15)	Capacity building	Environmental services	Economic effects	Technology, infrastructure and equipment transfer	Political co-operation	Mutual understanding
Right to health (DDPHRE 7, Rio 1, UDHR 25, ICESCR 12)	Health			Sanitation		
Right to work (UDHR 23, ICESCR 6)	Labor availability and employment		Wages and savings	Development of industries		Labor migration
Right to water and sanitation (DDPHRE 8, CEDAW 14, ICESCR 11 and the General Comment No 15)	Nutrition (water)	Water availability and sanitation	Water prices	Water availability and sanitation	Water conflicts	Water conflicts
Right to land and land rights of indigenous people (DDPHRE 10-11, 14, DRIP, UDHR 17, ILO No 169, CEDAW 16,)		Land entitlements and land productivity	Compensations	Housing and buildings	Land conflicts over resettlements	Social integration
Right to a healthy environment (DDPHRE 2, Rio 4, ICESCR 12)		Land and water quality, climate change				
Right to food (DDPHRE 8, ICESCR 11)	Nutrition (food)	Agricultural production		Livestock		
Right to education (DDPHRE 17, UDHR 26, ICESCR 13)	Knowledge and skills	Environmental education				
Women's right to equality (Rio 20, CEDAW 7)					Gender equity issues	
Right to non-discrimination (ICESCR 2,3, DDPHRE 2, Rio 6 +22, CEDAW 7, DRIP, UDHR 17, ILO No 169 14-19)		Land entitlements	Compensations		Marginalization, social divide, gender issues	Networks, interconnect-edness

light grey = directly affected, dark grey = indirectly affected

terms of their links with the six sustainable livelihood assets as mentioned in chapter 2.1.2.

Even though a comprehensive accounting of all the impacts and effects at all temporal and spatial scales is hardly possible Table 4 intends to capture some of the most important livelihood-related human rights tangent to Desertec with their specific reference points to the livelihood assets.

Table 4 clearly shows three things: First, that human rights are multidimensional, covering all six sustainable livelihood assets, and that they are interrelated and interdependent.

Secondly, it illustrates that Desertec would affect numerous livelihood-related human rights and that the concept could serve as a powerful vehicle for the promotion of sustainable human development (see: chapter 2.3.1). Thirdly, that some of these impacts and effects are directly attributable to Desertec and might manifest themselves at early stages, while others are indirect and may develop over a long time.

Based upon the results of Table 4 the next step is to define the relationships between the individuals and groups with valid human rights claims (rights holders) and state/non-state actors with correlative human rights obligations and responsibilities (duty bearers).

2.2.2 Who are the rights holders? Who are the duty bearers?

The treaties mentioned in chapter 2.2.1 form the core of the framework within which the universal system of human rights operates. Despite the fact that the majority of the MENA-countries have expressed important reservations, some of which take any sense of the conventions, most of the main treaties have been ratified by the MENA-countries, and, thus, are legally binding under international law (see: Table 5).

In this context, the ratification of the treaties also creates different roles, functions and obligations that are centered on two main agents in the Desertec discourse: The rights holders to claim their specific rights and the duty bearers to fulfil their obligations/responsibilities

Table 5: Ratification of UN-human rights conventions by MENA-countries

	ICCPR	ICESCR	ICERD	CAT	CRC	CEDAW	ICMWC	ILO No. 169
Algeria	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Bahrain	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Egypt	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Iraq	Yes	Yes	Yes	No	Yes	Yes	No	No
Jordan	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Kuwait	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Lebanon	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Libya	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Morocco	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Oman	No	No	Yes	No	Yes	Yes	No	No
Qatar	No	No	Yes	Yes	Yes	No	No	No
Saudi Arabia	No	No	Yes	Yes	Yes	Yes	No	No
Syria	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Tunisia	Yes	Yes	Yes	Yes	Yes	Yes	No	No
UAE	No	No	Yes	No	Yes	Yes	No	No
Yemen	Yes	Yes	Yes	Yes	Yes	Yes	No	No

Source: The Authors based on Arab-Human-Rights, 2011).

through appropriate laws, policies and programs within their national jurisdictions, and also extraterritorially.

Rights holders: Rights holders can make claims for the promotion, protection and fulfillment of the obligations or duties contained in the human rights treaties and owned by the duty bearers. In the context of Desertec there are three potential classes of rights holders at the local level.

- Labor rights holders: Employees, contractors and subcontractors;
- Environmental rights holders: Project area inhabitants and indigenous people;
- Social, political and welfare rights holders: People whose health, social role, education, water infrastructure and so on are affected by the project, e.g., women, elderly, children and ethnically marginalized people or individuals and organizations who are indirectly affected, but would like to participate and provide expertise in the decision-making process (such as NGOs).

Duty bearers: By ratifying one or more human rights treaties, UN-member states have committed themselves to legally binding obligations. From these obligations emerge several human rights-related tasks and functions that obligate governments as the primary duty bearer to respect, protect and fulfil human rights in order to secure the universal enjoyment of human rights within its territory. While the obligation to fulfil gives rise to the governmental duty to facilitate, provide and promote the realization of human rights, the obligations to respect and protect in turn require the governmental duty bearers to refrain and prevent third parties from committing violations against human rights. This includes the protection of human rights from potential or factual violations by non-state actors, such as private corporations.

Since to date, non-state actors, such as companies, have no directly enforceable human rights obligations but only respective responsibilities to respect these rights under international law, the governmental obligation to protect its population from negative human rights

impacts – including those of private and international corporations and donors – is especially relevant and important in the context of Desertec. Lessons learned from cases where host states failed to hold non-state actors accountable for human rights violations and thus have led to numerous adverse social impacts (“resource curse”), emphasize the importance of states and their national and local institutions to ensure that non-state actors are held to respect human rights through human rights-oriented standards and conditions under the state’s jurisdiction. Nigeria and Shell in the Niger Delta or Myanmar and Unocal in the course of natural gas extraction are just two of numerous examples in this context.

Despite the fact that the primary human rights responsibility rests with states, there is, however, an additionally large quantity of non-binding “soft law” responsibilities that call on non-state actors to respect the human rights of those affected by their activities. Examples include the “OECD Guidelines for Multinational Enterprises” (OECD, 2008) or the “ILO Tripartite Declaration on Multinational Enterprises and Social Policy” (ILO, 1977). According to these instruments non-state actors are held responsible to ensure that their activities do not contribute to or refrain from any human rights violations as well use their influence in support of human rights through the implementation of human rights concerns into project design. Additionally, some of the key principles within e.g. the UNFCCC climate finance framework or other public as well as governmental funding e.g. the EU are derived from human rights treaties and, thus, taken into account when negotiating and evaluating bilateral financial support agreements or its disbursement. In order to find funding options, this, once again, is of great importance for all firms related to the Desertec concept (Bird and Brown 2010, 10).

2.2.3 Safeguarding the integration of substantial human rights into Desertec: The role of procedural human rights

The realization of human rights is determined by the relationship between the individuals and groups with legitimate human rights claims (the rights holders)

and state and non-state actors with corresponding obligations/responsibilities (duty bearers). Consequently, a human rights-based approach places great emphasis on strengthening the relationships between these two levels by building up capacities of duty bearers to fulfil their obligations/responsibilities and capacities of right-holders to claim and exercise their substantial human rights effectively.

Procedural human rights are the foundation of a strong relationship between the two actors. They are derived from the main human rights principles such as indivisibility and interdependence, non-discrimination, equality and attention to vulnerable groups, information and participation as well as accountability and the rule of law as enshrined in the UDHR and widely recognized within the human rights treaties (UNDP 2003, 2).

Being one of the most prominent ones, the “Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters” (UNECE 1998) establishes a conceptual link between substantial and procedural human rights. The “Aarhus Convention” is derived from the “Rio Declaration on Environment and Development” as it focuses on the integration of human rights into development projects.¹¹ The convention is built upon three “pillars”: Access to environmental information (Article 4), public participation in environmental decision-making (Article 6) and access to justice (Article 9). While it is argued, however, that the “Aarhus Convention” is fairly weak legally due to a lack of legal enforcement mechanisms, the convention can be regarded as a “[...] statement on the importance of public participation in environmental decision-making” (De Santo 2011, 36) and, thus, works as a guiding principle when considering procedural aspects for the Desertec concept.

The three pillars of the “Aarhus Convention” are described in the following:

■ **The right of individuals and groups to information and transparency:**

Enables the rights holders to know their entitlements in order to be able to make valid claims and participate meaningfully in the issues that are being addressed by the duty bearers.

The “Aarhus Convention” stresses the need for making information accessible to the public and prohibits discrimination between requests for information. Moreover, it is not only important to make information available, but also essential to collect and publish information in an easy and understandable way for the public (DETR, 2000, p9).

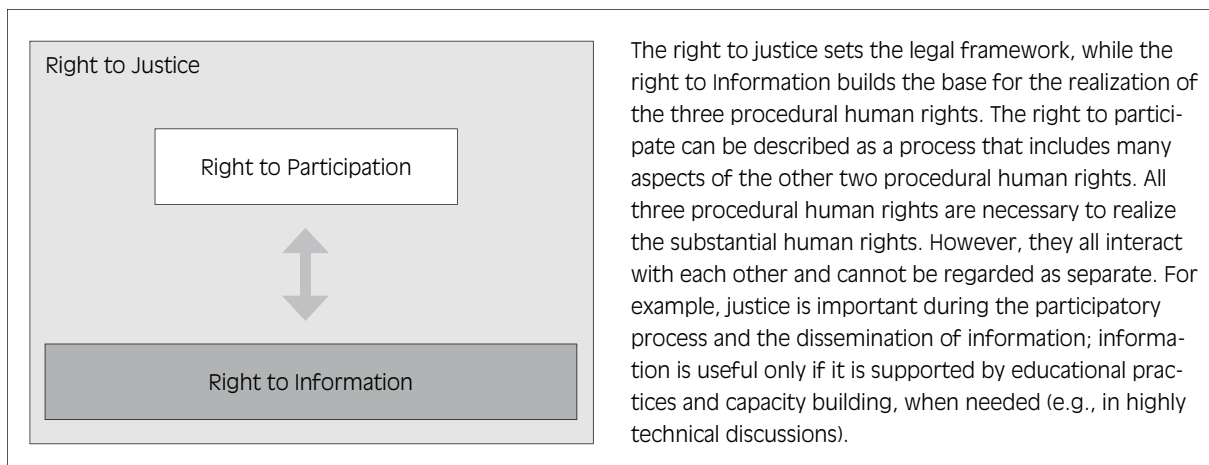
Furthermore, awareness-raising on upcoming decisions and capacity building of participants in a participatory process ensure that the information provided can be used as the cornerstone for the realization of procedural human rights. Hence, the dissemination of information is a requirement for a successful participatory process.

■ **The right to justice in environmental matters:**

Guarantees the rights holders to have access to effective administrative and judicial procedures that enable them to challenge any activity by duty bearers that could result in negative impacts on environment and society.

While the “Aarhus Convention” primarily emphasizes the need for a legal framework in a decision-making process, justice besides legal action is also inevitable in a participatory process. For example, equal voices have to be granted to all participants in the process, neglecting, e.g., status and gender.

¹¹ The Aarhus Convention explicitly states that public participation should be an integral part of environmental decision making and, therefore, attempts to implement Principle 10 of the Rio Declaration, which says: “Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.” (UNEP, 1992)

Figure 4: Interaction between the three procedural human rights

■ **The right of individuals and groups to participation in decision-making:** Requires the duty bearers to implement procedures that enable the general public to obtain information and to assert their interests concerning any activity that may have significant impacts on their environment and livelihood situation.

There are at least three good reasons for the enhancement of public participation in decision-making processes: Firstly, it is argued, that public participation leads to stronger democracy because it incorporates different values of individual citizens and stakeholders in a direct and fair way into the decision-making process.

Secondly, it is claimed that participation in decision-making enhances the quality of decisions, because expert and local knowledge are incorporated.

Thirdly, a participatory process may result in efficiency gains, because it decreases conflicts due to reasonable compromises that are acceptable for all stakeholders (Rosenström and Kyllönen 2007, 283-284).

Together, all three pillars of the “Aarhus Convention” are closely linked to one another (see Figure 4).

While the right to information and the right to justice are of similar importance, the right to participate can be regarded as the most complex issue. There are several

reasons for this: Only within a participatory process do the rights holders have the chance to express their opinions actively and make their voice heard. Furthermore, the right to participate integrates and addresses partly the other two procedural rights. Finally, the right to participate constitutes a process, while the success of this process depends to large extent on how this process is facilitated.

Although the “Aarhus Convention” has been signed mainly by states from Central and Eastern Europe as well as Central Asia and thus is only legally binding for these parties, all three procedural human rights are also recognized as substantial human rights within numerous other international human rights instruments. This makes them legally binding for all UN member states that have signed these treaties.

Through their influencing and bridging characteristics between the public authorities as duty bearers and the civil society in general as rights holders these three procedural human rights “pillars” develop their effectiveness as a tool for the fulfillment of the substantial human rights within the sustainable livelihood framework. Through the “gatekeeper asset” political capital, procedural human rights have the potential to empower the rights holders to make social and environmental claims and to hold governmental bodies and private sector actors accountable for their actions. The realization of the

The importance of procedural human rights for ensuring positive local outcomes: four case studies

Across the globe civil society and development organizations, governments and building companies find themselves in the trenches arguing over mega-projects. In the context of Desertec, many lessons can be learned from dam projects but also other renewable energy projects. In the case of dams for example the "World Commission on Dams (WCD)" states that, despite the intended benefits to respond to growing food needs, increasing water demands and the rapid expansion of energy requirements – "in too many cases, an unacceptable and often unnecessary price had to be paid to secure those benefits, especially in social and environmental terms" (WCD, 2000). Based on the results of the "World Commission on Dams (WCD)", dams have led to the displacement of 40-80 million people worldwide, caused a severe depletion of livelihood assets especially among the most vulnerable groups and created a significant and irreversible degradation of ecosystems. Ignoring the human rights of affected individuals, groups and communities has in many cases led to violent and often deadly conflicts, impoverishment, nutrition-deficiencies, cost-overruns and construction delays (see: case 1,2 and 4).

There are however a few cases where the recognition and provision of human rights have proven their value and a human rights- based approach has helped to strengthen the sustainable livelihood situation at the local level in practice. Besides such mega-projects, the realization of procedural human rights has also partly been neglected in smaller-scaled development projects, which led to a negative outcome of these projects (see: case 3). However, the importance of procedural human rights for positive project outcomes has been realized by different organizations that aim to include those rights as an integral part of their project strategy.

Case 1: The failure of a "build now – plan later"-attitude and the results of ignoring procedural human rights in the development of the Manantali dam

In the development process of the 200MW Manantali dam in Africa's Senegal River Valley, the involved

duty bearers, primarily embodied by the governments of Senegal, Mali and Mauritania, failed to include the affected communities in the decision-making process. Due to the absence of any transparent information about the project plans and the lack of the participatory inclusion of the general public as human rights holders, the Manantali dam project resulted in one big disaster bringing economic ruin, social disparities malnutrition and disease to hundreds of thousands families in the floodplains. 120 square kilometers of forest were destroyed in an already very arid region of the Sahel, 12.000 people forcibly displaced and hundreds of thousands of farmers were expelled from their land. In addition, since the dam has had widespread impacts on the basin's ecosystem harming ground water resources and riverine forests, it has led to the destabilization of traditional economic activities and together with a dramatically increase of water related diseases left the former rich Senegal River Valley as one of the poorest and most vulnerable in all three countries. Up to this day, the project has not generated any economic revenue because the huge cost overruns have eaten up the entire project budget. Severe political, ethnic and military tensions within the region and between the states led to violent conflicts and civil unrest nearly ending in a war between Mauritania and Senegal.

Case 2: The success story of addressing substantial human rights in the development of the Maguga Dam in Swaziland

A strong example of how the implementation of human rights into the development of energy projects can be handled successfully is the Maguga dam project in Swaziland. Through the participation of local authorities in the decision making process, the 19MW Maguga dam project acknowledges many substantial human rights by providing irrigation water for agricultural schemes, electricity for rural communities, employment in tourism initiatives and the dam itself as well as setting up farming initiatives and health facilities. Based upon a newly established independent dispute resolution process affected people can raise their

concerns around the dam and claim compensations. As a result the overall livelihood situation in the region has improved significantly and people have benefited from the infrastructure provided by the project. However, while the Maguga dam represents a good example of how energy projects can achieve their main objective and at the same time improve the livelihood security for local communities, it did not address the needs and demands at the local level within its bound of capabilities. Despite its many positive effects, critics point out that prior to the decision-making process a comprehensive assessment of the local needs could have improved the projects livelihood outcomes even further and empowered people to participate more effectively in the planning phase of the project.

Case 3: Lessons drawn from photovoltaic pilot projects without adequate realization of procedural human rights

The failure of a photovoltaic pilot project in rural South Africa was determined, to a large extent, by the lack of realizing procedural human rights on the part of the duty bearers. The project aimed to supply households with off-grid solar energy based on PV modules in the village of Folovhodwe. Six years after the installation of the modules, only 13 out of 528 were in working conditions. The reasons for that failure are that villagers were not informed sufficiently about the payment for maintenance fees and that those fees were too high, because they did not consider the income level of the villagers. Villagers were confused about the introduction of maintenance fees and their own responsibility to facilitate the maintenance of the solar panels. There was also a lack of skills and training to operate and repair faulty equipment. Overall, the duty bearers did not clarify the role of ownership during the planning and implementation phase of the project.

The example of Folovhodwe highlights the importance of adequately realizing the procedural human rights from the beginning of a project. Furthermore, it shows why the duty bearers should address capacity building and local circumstances for the long-term success of a project.

Case 4: Energy from Africa, for Africa? The implications for development of the Grand Inga Dam in Congo

The Grand Inga Dam mega-project, once finished, will be the world's largest dam. The dam, fueled by the mighty Congo River and located in the province of Bas-Congo, would have more than twice the capacity of the Three Gorges Dam in China. Grand Inga encompasses new heights related to its financial dimension and technical complexity: Just recently, the budget rose to \$ 100 billion and the whole project involves the construction of a 6000 km long transmission line starting from the Congo, continuing through the tropical forest and ending in Egypt.

However, besides poorly assessed environmental impacts, related to the construction of the transmission line and the dam itself, the planning concept of this mega-project almost neglected the inclusion of the civil society and lacks transparent dissemination of information. Until now, the whole project is negotiated between high-level stakeholders, such as the government of the Democratic Republic of Congo, the governments of other countries, private industry and foreign investors – all seek to benefit from the project. In the decision-making process so far, local communities were given no chance to make their voice heard against this powerful conglomerate of stakeholders. Furthermore, if the rural communities should really benefit from the project, the electricity grid must be expanded into the rural areas. For these reasons, doubts have been raised, whether the project will be really the foundation for the industrialization of Africa and thereby support local and rural communities with the strongly needed electricity as a basis for development or instead provide foreign businesses with cheap electricity and opportunities for Africa's business elites. The question has to be asked, whom the initiators of the project are truly targeting as beneficiaries.

Sources: International Rivers (2010); Bikam and Mulaudzi (2006); Hathaway (2005); Lustgarten (2009)

procedural human rights is, therefore, a necessity for the realization of positive livelihood outcomes.

The importance of procedural human rights for a successful realization of substantial human rights in development projects is illustrated in the info box.

2.3 Opportunities and challenges for sustainable human development through Desertec

The potential effects of the Desertec concept on sustainable human development are complex and multidimensional at the local level in the MENA-region. As seen in Table 4 the planning, implementation and monitoring processes of Desertec are tangent to numerous human rights and therefore have the potential to shape the livelihoods of the people living in the MENA-region in many ways.

The livelihood strategies as well as livelihood outcomes and their impacts and effects on sustainable human

development in the project's area will vary depending on the area's vulnerability context and the focus, scale and characteristics of the interlinkages between human rights holders and their corresponding duty bearers. Depending on these elements and their consideration within the planning of Desertec, the concept can either increase or reduce sustainable livelihood strategies that secure livelihood sustainability as well as livelihood outcomes, offering opportunities or challenges to sustainable human development

The Desertec concept therefore could potentially promote livelihood security and sustainable human development at the local level through the mitigation of external vulnerability pressures, the accumulation of sustainable livelihood assets as well as the stimulation of internal coping capacities and vice versa. On the other hand, however, the sole provision of the Desertec related infrastructure and services may not automatically lead to the benefits the project plans might promise and instead create a severe weakening of the people's livelihood situation.

Table 6: Desertec, human rights and the MDGs

MDG Target	Human Rights
Goal 1: Eradicate poverty and hunger	
Target 1a: Halve the proportion of people whose income is less than 1 dollar/day	Right to adequate standard of living Right to work
Target 1b: Achieve full and productive employment and decent work for all, including women and young people	Right to work
Target 1c: Halve the proportion of people who suffer from hunger	Right to food Right to water
Goal 7: Ensure environmental sustainability	
Target 7a: Integrate the principles of sustainable development into country policies and programs; reverse loss of environmental resources	Right to physical and mental health Right to adequate standard of living
Target 7b: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss	Right to land
Target 7c: Reduce by half the proportion of people without sustainable access to safe drinking water and basic sanitation	Right to water
Target 7d: Achieve significant improvement in lives of at least 100 million slum dwellers, by 2020	Right to adequate standard of living
Goal 8: Develop a global partnership for development	
Target 8a: Develop further an open, rule-based, predictable, non-discriminatory trading and financial system	Right to participation
Target 8b: Address the special needs of the least developed countries	Right to development Right to health

2.3.1 Livelihood asset accumulation or livelihood asset depletion through Desertec

By setting the respect, promotion and fulfillment of both substantial and procedural human rights as requirements to achieve the concept's main goals, Desertec could essentially improve the livelihood situation in the MENA-region. Since sustainable livelihoods and sustainable human development are closely inter-related and mutually reinforcing, a human rights-based approach to Desertec that focuses on securing sustainable livelihoods in order to avoid, mitigate and cope with the surrounding vulnerability context, at the same time enhances the different dimensions of sustainable human development. In fact, implementing the human rights objectives of promoting sustainable livelihoods is consistent with realizing sustainable human development strategies. Taking human rights into account within the Desertec design could not only boost the productivity through the modernization of the productive base, jobs, skills and income, support participation, empowerment and equity through democratic as well as non-discriminating decision-making structures but could also advocate a more sustainable use of natural resources such as water, soil and biomass. In sum, these effects may then stimulate livelihood options and prepare the ground for an environment that enables people to enjoy a higher and healthier standard of living with wider and well distributed opportunities for all without regard to gender, ethnic origin, religion or social status (see: Table 7 dark grey).

In addition, the promotion of stronger and more stable economic growth with the creation of jobs both in quantity and quality, the strengthening of social cohesion and poverty reduction and the establishment of participatory transparent and accountable policies through Desertec could also open a new complementary perspective in achieving some of the eight Millennium Development Goals (MDGs). As a matter of fact, the achievement of at least three MDGs highly intersects at many points with sustainable human development outcomes of a human rights-based approach to Desertec (see: Table 6).

However, in case that human rights and socio-geographic settings would not be taken into account in

designing Desertec, new challenges could arise in the wake of the concept's development. These challenges could inverse many of the positive outcomes and seriously hamper sustainable human development in the MENA-region and even well beyond. As potential consequences, many benefits could then turn into threats leading to a widespread depletion of the livelihood asset endowments with increased water and food insecurity, worsened living standards and further discrimination of vulnerable groups. Even civil unrest and political destabilization seems to be within the bounds of possibility due to the potential opposition from those groups that either are negatively affected by the project such as marginalized farmers in rural areas or have self-interests in the preservation of the status quo, e.g., autocratic elites (see: Table 7 light grey).

2.3.2 Selected examples of opportunities and challenges

As it has been highlighted in the previous section, the Desertec concept faces a number of different risks in order to contribute substantially to an improved livelihood situation of the affected rights holders (see: Table 7). These risks could mean negative challenges for the livelihood assets of the rights holders, which must be minimized or avoided, while they, at the same time, present great opportunities, which must be maximized. In addition, overcoming risks is also important for the duty bearers: Only if substantial positive contributions to the livelihoods of the rights holders are realized, social acceptance of the project can be assured. Social acceptance of the project, in turn, is needed to minimize the risk of civil unrest that could potentially threaten the realization of the Desertec concept as a whole. Hence, it should also be in the interest of the duty bearers to tackle these risks. Due to its specific character, the Desertec concept could affect various livelihood assets simultaneously, making it impossible to examine them separated from each other. For example, it is no option to look only at the energy generation part of a CSP power plant, while ignoring the water situation or social circumstances. Therefore, this section attempts to address some of the risks illustrated in Table 7 in more detail.

Table 7: Opportunities (dark) and challenges (light grey) for the human development at the local level in the MENA-region through Desertec

	Human Capital	Natural Capital	Financial Capital	Physical Capital	Political Capital	Social Capital
Right to adequate standard of living and right to life (Rio 5, UDHR 25, ICESCR 11) and (ICCPR 6)	Improved living standard, reduced poverty		Economic revenues from energy export, direct investments and from the sale of CERs through the CDM	Improved energy security through the provision of energy, enhancement of electricity grid, reduced risk of nuclear proliferation		Support of traditional practices and cultural institutions
	Worsened living standard, increased poverty		Need for substantial public subsidies	Higher energy prices, energy oligopolies, energy export (>15%)		Erosion of traditional practices and cultural institutions
Right to development and scientific progress (UDHR 27, Rio Declaration 3, ICESCR 15)	Improved over all capacity building and human development, International competitiveness, first mover advantage	Environmental security through reduced GHG-emissions and desalination	Possibility to reduce dependencies on fossil fuels, possibility to level out resource inequalities, economies of scale	Technology, infrastructure and equipment transfer, built-up and development of an industrial base with export capabilities	Intra- and transnational partnership, technology cooperation	Intra- and transnational mutual understanding
	Worsened coping capacity through increased environmental stress, poverty, hunger and social divide	Environmental insecurity through regional water exploitation	Higher prices for land and water	Increased regional disparities in development infrastructures (e.g., AC grid), allocation of electricity	Intra- and transnational conflict	Intra- and transnational conflict
Right to health (DDPHRE 7, Rio 1, UDHR 25, ICESCR 12)	Enhanced public health benefits through water and food security and higher incomes			Improved water sanitation through the additional water demand		
	Worsened public health situation through water and food insecurity			Worsened water sanitation through increased water scarcity		

Opportunities = dark and challenges = light grey

	Human Capital	Natural Capital	Financial Capital	Physical Capital	Political Capital	Social Capital
Right to work (UDHR 23, ICE-SCR 6)	Labor availability and employment		Higher incomes	New industrial development with new firms and industries		Reduced migration to urban areas
	Crimes through labor influx		Inequity in income distribution, elite capture		Mainly male labor influx	
Right to water and sanitation (DDPHRE 8, CEDAW 14, ICE-SCR 11 and the General Comment No 15)	Nutrition through clean and available drinking water	Water security through desalination, higher water tables and recharge of aquifers	Decreased water prices	Improved water sanitation	De-escalation of water conflicts	De-escalation of water conflicts
	Mal-nutrition through worsened water situation	Water insecurity through CSP cooling/mirror cleaning, thermal water discharge, Salinity	Increased water prices	Worsened water sanitation through increased water scarcity	Water conflicts over water use entitlements	Water conflicts over water use entitlements
Right to land and land rights of Indigenous people (DDPHRE 10-11, 14, DRIP, UDHR 17, ILO No 169, CEDAW 16)		Improved soil productivity	Inadequate financial compensation	Destruction of housing and traditional infrastructure	Land conflicts over land use entitlements civil unrest, terrorism	Possibility to level out socio-political inequalities, social integration
		Resettlements, endangerment of ecosystems				Land conflicts over land use entitlements, civil unrest, terrorism
Right to a healthy environment DDPHRE 2, Rio 4, ICESCR 12)		Improved soil productivity, water security, climate security				
		Land degradation, water insecurity, desalination as potential threat for aquatic life				

Opportunities = dark and challenges = light grey

	Human Capital	Natural Capital	Financial Capital	Physical Capital	Political Capital	Social Capital
Right to food (DDPHRE 8, ICESCR 11)	Improved nutrition status through more utilizable and virtual water	Increased agricultural productivity, increased food security through more utilizable and virtual water		Loss of live-stock through resettlements		
	Worsened nutrition status through competing water usage	Increased food insecurity through competing water usage				
Right to education (DDPHRE 17, UDHR 26, ICESCR 13)	Knowledge and skills	Education on environmental and energy issues				
Women's right to equality (Rio 20, CEDAW 7)					Gender equity	
					Gender Inequity in the decision-making process and the distribution of benefits	
Right to non-discrimination (ICESCR 2,3, DDPHRE 2, Rio 6 +22, CEDAW 7, DRIP, UDHR 17, ILO No 169 14-19)		Land entitlements of marginalized groups	Compensations		Reduced social divide, gender equity, inclusion of vulnerable and marginalized groups	Improved integration of marginalized parties
					Potential development-adverse income structures, existing clientelism and rentier mentalities, increased social disparities, exclusion of marginalized people	Exclusion of marginalized parties and enhancement of the regional divide

Opportunities = dark and challenges = light grey

Water related challenges

For a region that is already suffering from tremendous water scarcity, different technology options, such as cooling options of CSP power plants and desalination techniques, must be considered and evaluated with regard to water usage and environmental impacts when planning CSP generation plants. In a worst-case scenario, CSP power plants would significantly reduce the amount of available fresh water in a particular region. This could lead to increased competition over water resources for energy generation and food production, having direct implications for food security in the MENA-region (Yang and Zehnder 2002, 1413). On the other hand, due to the option of combined electricity generation and desalination, CSP power plants could also improve water availability.

Employment, technology transfer and capacity building

One of the often-claimed benefits of the Desertec concept is the generation of job opportunities for both the EU and the MENA-countries. However, it is anticipated that only a relatively small part of the employment opportunities will be created during the operation and maintenance phase; the great share of jobs will be created for manufacturing components and constructing CSP power plants.¹² Against the background of the already existing problem of high unemployment rates, especially for young people, and, at the same time, a rapidly growing labor force,¹³ there is a great need to maximize job opportunities in the MENA-region.

However, even when a technology and knowledge transfer scheme from the EU to the MENA-region would be feasible and effective, it is still unclear how,

and especially if, companies are willing to share their knowledge and technology with southern partners (Erdle 2010, 41). Evidence from other sectors show that foreign firms will not voluntarily transfer their technology without any incentives or regulations and that spillover effects are indeed quite limited (Gallagher 2006, 387,390-392).

In this context, another challenge is capacity building for high quality jobs in the region. As the example of the desalination sector in the MENA-region shows, there is a great and urgent need for well trained and qualified manpower (Gebel and Yüce 2008, 151), because nowadays

“[...] it is [...] faster to build a large-scale desalination plant than qualifying manpower to operate it” (Ghaffour 2009, 50).

It could be anticipated, that a similar situation exists for African engineers for planning and constructing a CSP power plant. Moreover, if no high-qualified jobs are created in the MENA-region, countries would trade the dependency on foreign energy with the dependency on foreign knowledge and technology, while to a large extent not being involved in the value-added chain.

Land-use and access rights, and resettlements

Land represents a key resource, especially in rural areas, where the livelihood of people is highly dependent on who owns land and how it is used. Although land is vast in the MENA-region, the amount of arable, productive land is very limited. A diverse system of land tenure exists, which reflects local cultural norms and the influence of European colonialism (Rihan and Nasr 2001, 110).

¹² According to the European Solar Thermal Electricity Association (ESTELA) per 100 MW installed capacity, 400 jobs will be created for manufacturing proposes, 600 for construction proposes and only 60 for operation and maintenance (each in man/year) (ESTELA 2009, 11). According to a recent World Bank report the number of local jobs in the MENA-region could rise to between 45000 and 60000 in the construction and manufacturing sector and 19000 in the operation and maintenance sector in the year 2025 (numbers according to scenario c “Transformation”, which is the most ambitious scenario) (The World Bank 2011, 4).

¹³ For example, North Africa’s overall unemployment rate has reached 10.5% in 2009 (women: 15.6%; youth: 24.7%) (ILO 2010, 27).

Furthermore, land and water tenure and, hence, access to land and water, cannot be regarded as separate issues in arid regions: The complicated “nexus” between water and land resources, concerning access to and distribution of land and water, which is rooted in traditions, Islamic law and also social status of different groups, is often a cause for conflicts (Casimir et al. 2002, 99-101).

As CSP power plants require large areas of land for their solar collectors,¹⁴ it cannot be ruled out that they interfere with other land requirements or traditional local laws and customs concerning access to land. This issue gains even more importance due to the fact that so far proposed projects sites, such as in Quarzazate (Morocco), are planned close to densely populated human settlements, because of water supply for cooling purposes or the connection to the electricity grid. Therefore, it cannot be precluded that land for CSP plants and additional infrastructure (e.g. roads or water pipes that are needed) conflicts with other land usage such as housing, farming or other industrial zones or that the large collector fields hinder local population in access to land or water resources. Even resettlements of local population are possible. Resettlements for other large-scale energy projects, such as dams, have often occurred with negative impacts on the affected population.¹⁵ In some cases, resettlements due to dams were even cause for violent conflicts (WCD 2000, 18-20).

Allocation of electricity

Access to electricity is a precondition for economic and sustainable human development. Therefore, it is of great importance to ensure that by far the greatest amount of

generated electricity will be provided predominantly for the local or regional population of the MENA-region at affordable prices. The Desertec vision aims to provide 15% of the EU's electricity needs by the year 2050. However, while this goal is constrained by missing transmission line connections between MENA and the EU, it is also by no means clear how this “electricity export gap” should be realized (e.g., on a project, country based or regional level). Next to the enhancement of High-Voltage Direct Current (HVDC) transmission lines, which are best suited to transport electricity over huge distances because of low losses, there is also a need to enhance the low- and medium-voltage grid, which uses commonly alternating current (AC) transmission lines to supply local consumers. The AC grid infrastructure in the MENA-region is, however, also fairly weak (Lorych 2010, 20).¹⁶

Undiscovered challenges

Despite the growing number of large-scale infrastructure projects, so-called megaprojects, throughout the world, poor performance records in terms of economy, environment, sustainable human development and public acceptance characterize many of these projects. This so-called “performance paradox” is rooted in the belief, that everything can be predicted in a Newtonian way, where cause and effect are self-evident. This non-systemic approach, however, ignores to a large extent externalities, such as changing planning policies, needs and governments as well as political or civil interference. A technical based, Newtonian approach does not leave space for learning and does not acknowledge imperfect knowledge about a subject. The reasons for misinformation about proposed megaprojects, where benefits are

¹⁴ Land requirements vary depending on the specific CSP technology employed, but, as a rule of thumb, approximately 1 km² is needed for a generation capacity of 50 MW (Müller-Steinhagen and Trieb 2004, 45).

¹⁵ For example, resettlements of local population forced by the Moroccan government occurred in Quarzazate during the 70s mostly in the course of the built-up of the Mansour ed-Dahbi dam. Approximately, 8,000 people were relocated and 1,000 ha of arable land were lost. The resettlement policy of the government was not geared towards the needs of the relocated local population and was not well accepted and adopted by those affected. Compensation measures were, for example, found inequitable and were the cause of social unrest (Schlüter 2006, 84-86).

¹⁶ Power cuts due to the capacity limit of the electricity grid were already experienced in different MENA countries, such as Jordan (ME-NAFN, 2010).

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emphasized and costs and risks are deemphasized, are above all political reasons: different key stakeholders want “their” project to prevail and/or decisions makers are misled about true costs and risks of the project, because commercial stakeholders provided inadequate information (Flyvbjerg 2007, 19-21).

Existing CSP projects are to a great extent established in very different regions of the world with differing cultural and social backgrounds (such as the USA and Spain). Due to the lack of experience in the target region and the technocratic approach pursued by Desertec so far, there is a great chance that new undiscovered challenges will occur when establishing CSP power plants in the MENA-region.

If the Desertec concept pursues an “Everything Goes According to Plan”-approach that does not provide space for newly discovered information and knowledge, it runs the risk of becoming another “planning fallacy”.

3 Conclusion

3.1 Principles and recommendations to emphasize sustainable human development issues in the Desertec concept

The analysis of opportunities and challenges shows that there is room for improvement of the Desertec concept in order to foster sustainable human development at the local scale in the MENA-region. This chapter suggests potential sustainability principles needed to safeguard this goal. The formulated sustainability principles aim towards the counteraction of challenges and the enhancement of opportunities for affected rights holders. Using these principles as a foundation, the chapter will further present recommendations for taking the first step towards the operationalization and implementation of these principles in a practical way within the Desertec concept. The purpose of the recommendations is to put an emphasis on and to provide a basis for analyzing sustainable human development issues of the Desertec concept.

In order to fulfil this task, attention is especially paid to “lessons learned” from other large-scale energy and water related projects. After all, as a megaproject that seeks to deliver sustainable human development by improving the livelihood assets of communities through the supply of electrification, water and employment, the Desertec concept can in some respects be compared to large dam projects. Various scientists¹⁷ and commissions, most notably the “World Commission on Dams”, have intensively dealt with questions of how to decrease or, when possible prevent, potential adverse impacts of dams, such as resettlements and elite capturing; how to emphasize sustainable human development issues in the project design and how to maximize benefits for the local communities that are most affected by negative impacts (see: info box). As a result, these authors developed principles and recommendations for large

dam projects, where sustainable human development for local communities has been in the focus of the discussion. The knowledge gained from experience with large dam projects provides a valuable “outside view” for the discussion about and the further improvement of the Desertec concept because it could alleviate overconfidence and assist to adjust the concept towards a more people-centered and, thus, reality-based approach. For these reasons, the development of principles and recommendations for Desertec in this study is oriented on “lessons learned” from large dam projects.

3.1.1 Suggestions for sustainability principles in the Desertec concept

Principles are in general defined as the first hierarchical level of a framework consisting out of principles, followed by criteria and measurable indicators. Principles can be regarded as general conditions for achieving an ultimate goal, in this case sustainability (Van Cauwenbergh et al., 2007, p232).

It is important to mention that the principles formulated in this study must be regarded as suggestions for the further development of sustainability principles for the Desertec concept. As participation is an integral part of the process of developing principles or any kind of guidelines, the suggested principles are rather a conceptual starting point for a dialogue among stakeholders than an applicable ready-to-use set of rules. Simultaneously, an effective set of principles cannot be developed without empirically gained knowledge. For these reasons, it would be a drastic mistake and a contradiction in terms to impose sustainability principles without an adequate representation of views and claims from affected people. Therefore, these principles can neither be complete nor exhaustive until the relevant representatives of the MENA-region are involved in their further development.

This study takes a human rights-based approach with special attention to the sustainable livelihood assets of affected rights holders in order to formulate sustainabil-

¹⁷ For example, resettlements of local population forced by the Moroccan government occurred in Quarzazate during the 70s mostly i

Table 8: Principles for the Desertec concept to foster sustainable human development outcomes

Strategic key elements	Suggestions for sustainability principles for the Desertec concept
Social inclusion	All affected communities should be fully informed about any Desertec related project in an early stage of the project. Information should be disseminated in a complete and easy understandable way. Particular attention should be paid to the needs of vulnerable groups and marginalized people. The improvement of the livelihood status of the poorest people should be of high priority. Benefits of any Desertec related project should be maximized, while negative impacts should be minimized. If negative impacts are unavoidable, those who are affected should be compensated in an adequate (just & fair) manner. Those, who are strongly affected should be the first beneficiaries (e.g. access to electricity and water or other by the project generated goods and services, such as job opportunities).
Empowerment	Active participation of relevant stakeholders during relevant stages of a project to the benefit of affected people in a complete, transparent and culturally appropriate form should be a fundamental of all Desertec related projects. An emphasis should be laid on a fair dialogue between duty bearers & rights holders especially including those who are most affected by the project (such as local communities, women and indigenous people). Strengthening of capabilities should be an outcome of any Desertec related project. The capabilities should be strengthened by transfer of know-how and skills from north to south and from south to south. Access to the judicial system should be guaranteed for any rights holder.
Human security	International agreed standards, especially the human rights, as well as customary law, local understandings of and control over resources should be acknowledged. No violence or force should be used through any project stage. Social and environmental issues should be valued with the same importance as technical and economic issues. Any risk that could threaten the food, health, water, environmental or personal security of the duty bearers' livelihood assets should be mitigated.

ity principles for the Desertec concept. As the analysis of the substantial and procedural human rights reveals, it is obligatory that duty bearers respect, protect and fulfil these rights in order to guarantee sustainable human development outcomes. Grounded in the duty bearers' obligations/responsibilities and as a result of the analysis, three strategic key elements emerge: Social inclusion, empowerment and human security. In this study, the strategic key elements are defined as followed:

■ **Social inclusion:** The removal of institutional barriers and the enhancement of incentives to increase the access of the rights holders to assets and development opportunities.¹⁸

■ **Empowerment:** The enhancement of assets and capabilities of the rights holders, to engage, influence and hold accountable the duty bearers which affect them.¹⁹

■ **Human security:** The protection of the vital core of all human lives from critical and pervasive environmental, economic, food, health, personal and political threats.²⁰

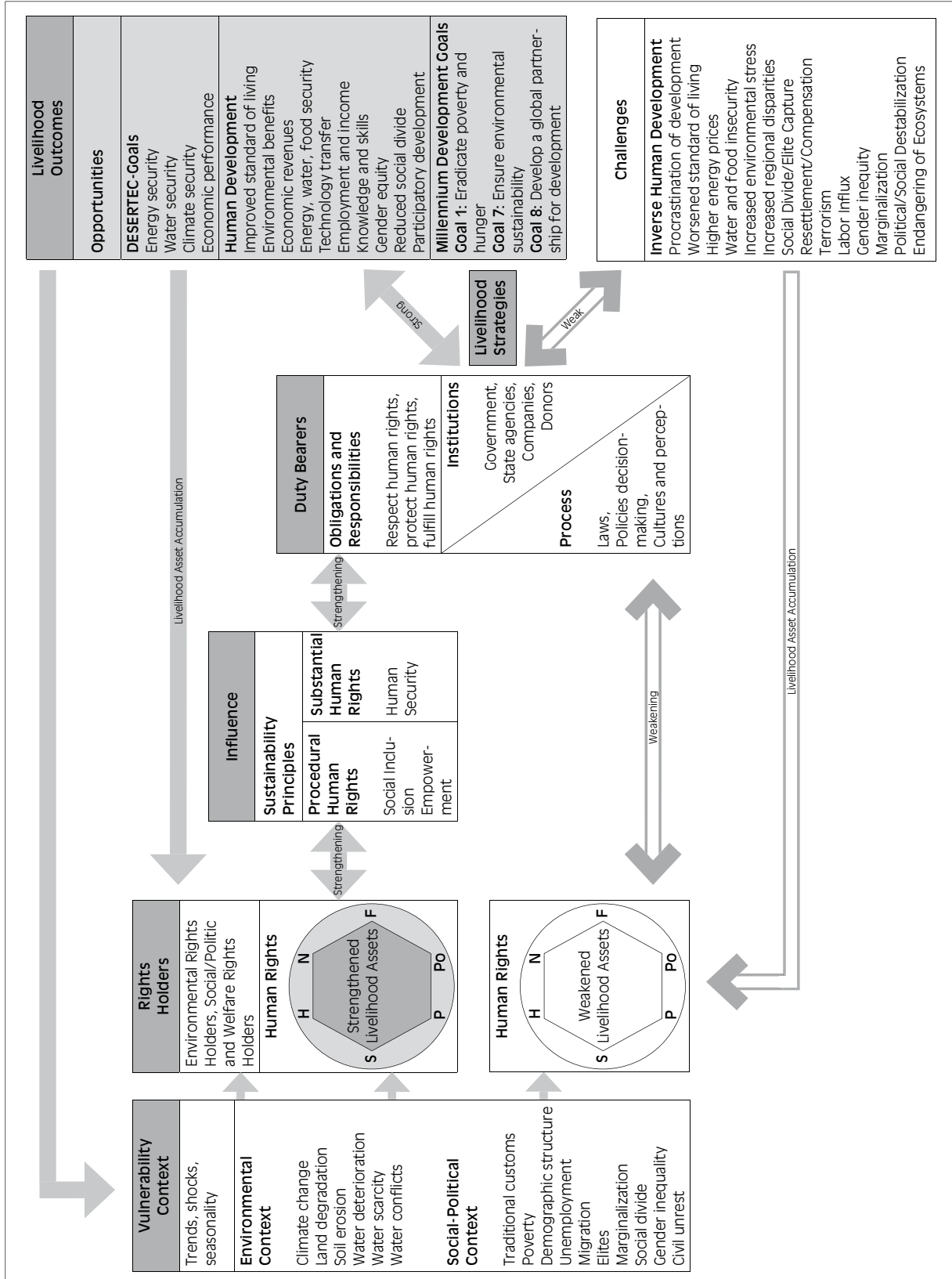
Social inclusion and empowerment are complimentary approaches. While social inclusion seeks to achieve system-level institutional change, empowerment approaches work “from below” (Bennet, 2002, p6-7).

¹⁸ Based on the definition by Bennet (2002, p13).

¹⁹ Based on the definition by Bennet (2002, p13).

²⁰ Definition by Owen (2004, p382).

Figure 5: Analyzing Desertec through the lens of a human rights-approach implemented into the sustainable livelihood framework



Furthermore, the three strategic key elements are connected to the procedural and substantial human rights: For the realization of social inclusion, access to information (right to information) is necessary; empowerment requires participation (right to participation) and implies the rule of law respectively access to the judicial system (right to justice). Human security, which is in essence the respect for human rights (Ramcharan, 1992, p1), builds the bridge to the acknowledgement of the substantial human rights. However, all three strategic key elements aim towards the achievement of sustainable human development. Therefore, they are mutually reinforcing and overlapping (see also: Figure 5).

Based upon the three strategic key elements and guided by already established principles of the “World Commission for Dams”, Table 8 illustrates the first suggestions for sustainability principles related to the Desertec concept.

3.1.2 Recommendations

The acknowledgement of the formulated principles establishes an imperative need for action to advance the perception of the Desertec concept as an integrated development concept, which gives opportunity to strengthen the sustainability of the people’s assets and livelihood security as well as promote sustainable human development. The implementation of specific sustainability principles to evaluate the impacts during all the main phases of the realization of any Desertec related project (planning, implementation, operation and evaluation) should therefore be obligatory.

Two different groups of duty bearers are addressed by these recommendations: The state, as the primary duty bearer, and non-state actors, such as, private companies, project developers, researchers and civil society (NGOs).

The state is regarded to set the overall “playing ground” for non-state actors within its territory. Thus, it acts in a more “top-down” manner. Non-state actors, in contrast, are directly engaged with the implementation of Desertec related projects on an operational level. But

since non-state actors also refer to parties that are directly affected by Desertec as well as organizations or individuals that have special expertise, knowledge and skills, and, therefore could provide valuable insights on its development process, the recommendations for non-state actors can be more specific on a “bottom-up” level.

Based upon the analysis of this study and derived from the previously formulated principles, the following recommendations can be given in order emphasize sustainable human development issues in the Desertec concept on a local scale in the MENA-region.

As a precondition, it is necessary that the state realizes its obligations with respect to human rights.

In this respect, the state, as the primary duty bearer has to:

- Create a reliable framework for the respect and support of the human rights

The state must enforce existing domestic laws and sanction mechanisms against any human rights violation consistently and coherently.

- Encourage non-state actors to act accordingly to human rights principles

The state must encourage non-state actors to hold on to their responsibilities to respect human rights principles and foster a dialogue with non-state actors on human rights issues.

- Impose requirements for non-state actors (especially transnational companies)

The state must impose minimum requirements for, especially, transnational companies to act accordingly to human rights principles.

In order to address the non-state actors, such as private companies, project developers and the civil society, it is necessary to:

- Understand the vulnerability context

As a basic requirement, it is important to investigate and understand the external vulnerability context that frames any Desertec related project (involving socio-cultural, institutional, historical, economical and political issues).

- Start prior to implementation

It is necessary to conduct an empirically based human development analysis focusing on the needs and strengths of the people living in the target region prior to the implementation of any Desertec related project. However, to ensure that findings can effectively be addressed in the project design and to increase people's ownership over the whole project cycle, the stakeholders being affected by a Desertec related project at the local scale should be identified.

- Analyze human development risks (opportunities and challenges)

In order to emphasize sustainable human development issues of the Desertec concept it is recommended to identify, assess and monitor human development risks (opportunities and challenges) Desertec could have on the sustainable livelihood assets of local communities, through the integration of the affected people's voices and needs during the whole project cycle. Negative and positive human development risks have to be estimated, and specific actions towards the maximization of opportunities and mitigation of challenges have to be taken.

- Determine options

While the sustainable human development context of any Desertec related project is being investigated, the appropriateness of different design options has to be determined according to the people's needs and strengths

and with regard to certain issues, such as water usage of CSP plants, project size and site selection.

- Further develop sustainability principles

As mentioned before, principles formulated in this study should be seen as suggestions that have to be further discussed and developed together with relevant representatives from the MENA-region.

3.1.3 Next steps

Moving the Desertec concept towards more equity and sustainability will be challenging. A diverse interplay between stakeholders with different backgrounds such as governmental institutions, companies, industrial project developers and civil society representatives – including scientists, researchers and NGOs as well as representatives of marginalized groups e.g. nomads – will be required to fulfil this demanding task.

Addressing the concept's sustainable human development dimension should be regarded as more than just a simple item on the "to-do" list. Moreover, the incorporation of human development issues has to be seen as a dynamic process, where the primary focus lays on knowledge gaining and which brings to the table valuable contributions for the improvement of the Desertec concept itself. Therefore, the process needs a methodological approach that investigates the sustainable human development dimension of affected rights holders and which is, at the same time, flexible enough to be adjusted to the specific context of the Desertec concept.

To be effective, such a process must be empirically based and locally approached, while taking into consideration the specifics of the region it is embedded in. Social analysis²¹ is an approach that can assist in facilitating and structuring the systematic participation of stakeholders and in providing a framework for dialogue among these stakeholders.

²¹ For more information on this topic see: The World Bank (2003): Social Analysis Sourcebook: Incorporating Social Dimensions into Bank-Supported Projects. Social Development Department. Washington, DC.

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In addition, social analysis can articulate the project's sustainable human development outcomes as well as challenges and opportunities and can, therefore, evaluate whether a project contributes to sustainable human development in the MENA-region. Social analysis includes a variety of different tools (such as interviews, questionnaires, surveys, focus groups and group discussions, consultation workshops and field research), which have to be adjusted and chosen depending on the project's circumstances, context and restraints (e.g., time and budget). Furthermore, it can be used on different levels combining top-down and bottom-up approaches.

In combination with human rights as analytical entry points presented in this study, the sustainable-livelihood approach could build the conceptual framework for a social analysis focusing on the rights holders in relation to the Desertec concept.

However, social analysis should be tested on planned projects in the context of the Desertec concept with the goal of adopting the abstract terms of duty bearers and rights holders on a real world example. In this way, the analysis will provide more specific results.

With the experiences gained in reference projects, it may be possible to set minimum requirements and more specific procedural guidelines for other Desertec related projects.

- Adams, W. (2000): The Social Impact of Large Dams: Equity and distribution issues. In: WCD Thematic Review I.1 prepared as an input to the World Commission on Dams. Cape Town
<http://www.esocialsciences.com/data/articles/Document1115200600.5004389.pdf> (13.04.2011)
- Al-Widyan, M. I., Al-Muhtaseb, M. A. (2009): Institutional Aspects of Regional Energy Systems, in Mason, M., Mor, A.: Renewable Energy in the Middle East. Enhancing Security through Regional Cooperation. Springer-Verlag, Dordrecht, pp. 177-195
- Arab human rights, UNDP (2011): Arab ratification of UN human rights conventions.
www.arabhumanrights.org/en (13.04.2011)
- Baxi, U. (2001): What happens next is up to you: Human rights at risk in dams and development. In: American University International Law Review 16, 1507-1529.
<http://www.wcl.american.edu/journal/ilr/16/baxi.pdf?rd=1> (23.04.2011)
- Bennet, L. (2002): Using empowerment and social inclusion for pro-poor growth: A theory of social change. Background paper for the social development sector strategy paper
- Bikam, P. and Mulaudzi (2006): Solar energy trial in Folevohodwe South Africa: Lessons for policy and decision-makers. In: Renewable Energy 31, 1561-1571
- Bird, N. and J. Brown (2010): International climate finance: principles for European support to developing countries. EDC2020 Working Paper 6.
http://www.edc2020.eu/fileadmin/publications/EDC_2020_Working_Paper_No_6.pdf (13.04.2011)
- Brooks, D. B. (2007): Fresh water in the Middle East and North Africa, in Lipchin, C., Pallant, E., Saranga, D., Amster, A.: Integrated Water Resources Management and Security in the Middle East. Springer-Verlag, Dordrecht, pp. 33-64
- Brauch, H. G. (2006): Desertification – A new security challenge for the Mediterranean? Policy agenda for recognising and coping with fatal outcomes of global environmental change and potentially violent societal consequences, in Kepner, W. G., Rubio, J. L., Mouat, D. A., Pedrazzini, F.: Desertification in the Mediterranean Region. A Security Issue. NATO Security through Science Series. Springer Netherlands, Dordrecht, pp. 11-85
- Casimir, M., Casciarri, B., Kirscht, H., Rademacher, C., Rössler, M. and Schlütter, D. (2002): Water distribution and water conflicts. In: German programme on global change in the hydrological cycle GLOWA. Status report. GSF – Forschungszentrum für Umwelt und Gesundheit. Munich
- CIA World factbook (2009): Morocco. <https://www.cia.gov/library/publications/the-world-factbook/geos/mo.html> (13.04.2011)
- Climate Investment Funds CIF (2011). <http://www.climateinvestmentfunds.org/cif/designprocess> (06.03.2011)
- Csp today (2011): Csp today world map. <http://www.csptoday.com/usa/pdf/CSPTodayWorldMap2011.pdf> (13.04.2011)
- CTF Trust Fund Committee CTF (2009): Clean Technology Fund Investment Plan for Concentrated Solar Power in the Middle East and North Africa Region. Inter-sessional Meeting of the CTF Trust Fund Committee. Washington, D.C.
- CTF Trust Fund Committee CTF (2010): Update on the CSP Mna Investment Plan. Meeting of the CTF Trust Fund Committee. Washington, D.C.
- De Jong, C., Makroum, K. and G. Leavesley (2006): Developing an oasis-based irrigation management tool for a large semi-arid mountainous catchment in Morocco. Bridging the gaps between design and use: developing appropriate tools for environmental management and policy. In: Hydrology and Earth System Sciences, Vol. 8 (6). http://www.iemss.org/iemss2006/papers/s10/186_deJong_2.pdf (13.04.2011)
- De Montravel, G. (2010): Medgrid, a co-development project for the exchanges of electricity in the Mediterranean basin. Presentation for Dii annual conference 2010

- De Santo, E.M. (2011): Environmental justice implications of Maritime Spatial Planning in the European Union. In: Marine Policy 35, 34-38
- Department for International Development dfid (1998): Participation and combined methods in African poverty assessments: Renewing the agenda. London
- Department for International Development dfid (1999): Sustainable livelihoods guidance sheets. London. <http://training.itcilo.it/decentwork/staffconf2002/presentations/SLA%20Guidance%20notes%20Section%202.pdf> (13.04.2011)
- Department of the Environment, Transport and the Regions detr (2000): Public participation in making local environmental decisions. The Aarhus Convention Newcastle workshop. Good practice handbook. London
- Desertec Foundation DF (2009a): Red Paper. Das Desertec Konzept im Überblick. Berlin
- Desertec Foundation DF (2009b): Clean power from the deserts. The DESERTEC concept for energy, water and climate security. White book, 4th Edition, Bonn. http://www.desertec.org/fileadmin/downloads/DESERTEC-WhiteBook_en_small.pdf (13.04.2011)
- Desertec Foundation DF (2010): Desertec university network gegründet. Press Release. <http://www.desertec.org/de/presse/pressemitteilungen/101103-01-desertec-university-network-gegruendet-internationale-wissenschaftskooperation-fuer-wuestenstrom/> (13.04.2011)
- Desertec Foundation DF (2011): Desertec Foundation Website. <http://www.desertec.org/de/organisation/> (10.05.2011)
- Desertec Industry Initiative DII (2010): Desertec: Support for the Dii from a further 17 Associated Partners from industry and research. Press release. Munich
- Desertec Industry Initiative DII (2011a): DII Website. Answers on DII and Desertec. <http://www.dii-eumena.com/dii-answers/dii-and-desertec.html> (10.04.2011)
- Desertec Industry Initiative DII (2011b): Correspondence with Sigrid Goldbrunner, Senior Analyst Communication (16.05.2011)
- Deutsches Zentrum für Luft- und Raumfahrt dlr (2005): MED-CSP. Concentrating solar power for the mediterranean region. Final Report, Stuttgart. http://www.dlr.de/Portaldata/1/Resources/portal_news/newsarchiv2008_1/algerien_med_csp.pdf (13.04.2011)
- Deutsches Zentrum für Luft- und Raumfahrt dlr (2006): TRANS-CSP. Trans-Mediterranean Interconnection for Concentrating Solar Power. Final Report, Stuttgart
- Deutsches Zentrum für Luft- und Raumfahrt dlr (2007): AQUA-CSP. Concentrating solar power for seawater desalination. Final Report, Stuttgart. <http://www.dlr.de/tt/Portaldata/41/Resources/dokumente/institut/system/projects/aqua-csp/AQUA-CSP-Full-Report-Final.pdf> (13.04.2011)
- Erdle, S. (2010): The Desertec Initiative. Powering the development perspectives of the Southern Mediterranean countries? German Development Institute. Discussion Paper. Bonn. [http://www.die-gdi.de/CMS-Homepage/openwebcms3.nsf/%28ynDK_contentByKey%29/ANES-89JH6C/\\$FILE/DP%2012.2010.pdf](http://www.die-gdi.de/CMS-Homepage/openwebcms3.nsf/%28ynDK_contentByKey%29/ANES-89JH6C/$FILE/DP%2012.2010.pdf) (13.04.2011)
- European Solar Thermal Electricity Association estela (2009): Solar power from the sunbelt. The solar thermal electricity industry's proposal for the Mediterranean solar plan. A programme of the union for the Mediterranean. Brussels, Belgium. http://www.estelasolar.eu/fileadmin/ESTELAdocs/documents/2009_-_ESTELA_-_MSP_17_-_09_07_06__FINAL_.pdf (13.04.2011)
- Flyvbjerg, B. (2007): Megaproject policy and planning: Problems, causes, cures. Doctoral Thesis. Aalborg University
- Food and Agriculture Organization fao (2011a): World food situation. Rom. <http://www.fao.org/worldfoodsituation/wfs-home/foodpricesindex/en/> (13.04.2011)
- Food and Agriculture Organization fao (2011b): FAO Food Price Index. <http://www.fao.org/worldfoodsituation/wfs-home/foodpricesindex/en/> (13.04.2011)

- Gallagher, K.S. (2006): Limits to leapfrogging in energy technologies? Evidence from the Chinese automobile industry. In: *Energy Policy* 34, 383-394
- Gebel, J. and Yüce, S. (2008): A new approach to meet the growing demand of professional training for the operating and management staff of desalination plants. In: *Desalination* 220, 150-164
- Ghaffour, N. (2009): The challenge of capacity-building strategies and perspectives for desalination for sustainable water use in MENA. In: *Desalination and Water Treatment* 5, 48-53
- Gropp, T. (2011): Article on Science.orf.at. <http://science.orf.at/stories/1681181/> (20.02.2011)
- Handelsblatt (2010): Frankreich verkabelt Desertec mit Europa. <http://www.handelsblatt.com/technologie/energie-umwelt/energie-technik/frankreich-verkabelt-desertec-mit-europa/3645126.html> (10.3.2011)
- Hathaway, T. (2005): Grand Inga, Grand Illusions? In: *World Rivers Review*. 20, 6-7
- Heidecke C., Kuhn A., Klose S. (2008): Water pricing options for the Middle Drâa river basin in Morocco. In: *African Journal of Agricultural and Resource Economics* 2, 170-187
- Heese, B. (2009): Die Union für das Mittelmeer. Zwei Schritte vor, einen zurück? LIT-Verl., Berlin
- International Energy Agency IEA (2011): Energy prices and taxes. Paris. http://www.iea.org/publications/free_new_Desc.asp?PUBS_ID=2385 (13.04.2011)
- International Labor Organization ILO (1989): Convention concerning Indigenous and tribal peoples in independent countries. Geneva. <http://www.un-documents.net/c169.htm> (13.04.2011)
- International Labor Organization ILO (2010): Global Employment Trends. Geneva
- International Labor Organization ILO (1977): Tripartite Declaration of Principles Concerning Multinational Enterprises and Social Policy. Geneva. <http://actrav.ilo.org/actrav-english/telearn/global/ilo/guide/triparti.htm> (13.02.2011)
- International Labor Organization ILO (2011): Youth unemployment in the Arab world is a major cause for rebellion. ILO Press release. http://www.ilo.org/global/about-the-ilo/press-and-media-centre/insight/WCMS_154078/lang-en/index.htm (13.04.2011)
- Intergovernmental Panel on Climate Change IPCC (2007): Climate Change 2007: Working group II: Impacts, adaptation and vulnerability. Chapter 9. Geneva. http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg2_report_impacts_adaptation_and_vulnerability.htm (13.04.2011)
- International Rivers (2010): Protecting rivers and rights: The World Commission on Dams recommendations in action. Berkeley. http://www.internationalrivers.org/files/WCDbriefingkit_0.pdf (13.04.2011)
- Jarvis, D.S.L. (2004): The rise and rise of risk. Australian Review of Public Affairs. The University of Sydney. <http://www.australianreview.net/digest/2004/06/jarvis.html> (13.04.2011)
- Klose, A. (2009): Soil characteristics and soil erosion by water in a semi-arid catchment (Wadi Drâa, South Morocco) under the pressure of global change. Dissertation, Bonn. <http://hss.ulb.uni-bonn.de/90/2009/1959/1959-1.pdf> (13.04.2011)
- Lorych, L. (2010): Perspectives on a South – North solar energy cooperation. Presentation for SEPA workshop, Gießen, Germany
- Lustgarten, A. (2009): Conrad's Nightmare: The World's Biggest Dam and Development's Heart of Darkness
- McHugh, T. F. (2008): From micro to supramacro: Extending the sustainable livelihood framework. http://www.scribd.com/full/2296154?access_key=key-ox9mzx6922amyhicgii (13.04.2011)
- MENAFN (2010): Jordan- New grid projects to reduce power cuts. http://www.menafn.com/qn_news_story_s.asp?storyid=1093362774 (13.04.2011)
- Müller-Steinhagen, H. and Trieb, F. (2004): Concentrating Solar Power. A Review of the Technology. In: *Quarterly of the Royal Academy of Engineering Ingenia*, 18

- Office of the United Nations High Commissioner for Human Rights ohchr (2007): The core international human rights instruments and their monitoring bodies. Geneva. <http://www2.ohchr.org/english/law/index.htm> (13.04.2011)
- Organisation for Economic Co-operation and Development OECD (2008): OECD Guidelines for Multinational Enterprises. www.oecd.org/dataoecd/56/36/1922428.pdf (12.02.2011)
- Ouarzazate.com (2011): Brève Présentation de Ouarzazate. <http://www.ouarzazate.com/fr2/presentationdelaville.htm> (13.04.2011)
- Overseas Development Institute odi (2000): Sustainable livelihoods and political capital: Arguments and evidence from decentralization and natural resource management in India. Working Paper 136. London. <http://www.odi.org.uk/resources/download/2025.pdf> (13.04.2011)
- Overseas Development Institute odi (2001): Sustainable livelihoods, rights and the new architecture of aid. London. <http://www.odi.org.uk/resources/download/2074.pdf> (13.04.2011).
- Overseas Development Institute odi (2007): Human rights and livelihood approaches for poverty reduction. Briefing Note. London. <http://www.odi.org.uk/resources/download/1548.pdf> (13.04.2011)
- Owen, T. (2004): Human security – conflicts, critique and consensus: Colloquium remarks and a proposal for a threshold-based definition. In: Security Dialogue 35, 372-387
- Ramcharan, B.G. (1992): Human Rights and Human Security. <http://www.humansecurity-chs.org/activities/outreach/ramcharan.pdf> (12.02.2011)
- Ravenga, C. et al (1998): Watersheds of the world. Ecological value and vulnerability. A joint publication of the World Resources Institute and the Worldwatch Institute, Washington
- Reuters (2009): Morocco unveils 9 bn dollar solar power scheme. <http://af.reuters.com/article/investingNews/idAFJ0E5A202D20091103> (13.04.2011)
- Richter, KS. (2010): Desertec Decoded: Interview with Desertec Foundation and DII. SolarNovus.com. http://www.solarnovus.com/index.php?option=com_content&view=article&id=1530:desertec-decoded-interview-with-desertec-foundation-and-dii&catid=63:business-features&Itemid=242 (12.05.2011)
- Rihan, M. and Nasr, M. (2001): Prospects for land reform and civil society movements in the Near East and North Africa. In: Ghimire, K.B. and Moore, H. (2001): Whose land? Civil society perspectives on land reform and rural poverty reduction: Regional experiences from Africa, Asia and Latin America
- Rosenström, U. and Kyllönen, S. (2007): Impacts of a participatory approach to developing national level sustainable development indicators in Finland. In: Journal of Environmental Management 84, 282-298
- Ruchser, M. (2011): Fukushima and the liberation movements in North Africa: What future for Desertec and “electricity from the desert”? Discussion paper of the German Development Institute (DIE), Bonn, [http://www.die-gdi.de/CMS-Homepage/openwebcms3_e.nsf/%28ynDK_contentByKey%29/MRUR-8FLE7H/\\$FILE/German-Development-Institute_Ruchser_04.04.2011.pdf](http://www.die-gdi.de/CMS-Homepage/openwebcms3_e.nsf/%28ynDK_contentByKey%29/MRUR-8FLE7H/$FILE/German-Development-Institute_Ruchser_04.04.2011.pdf) (13.04.2011)
- Schinke, B. and Klawitter, J. (2010): DESERTEC – Baustein einer neuen Sicherheitsarchitektur innerhalb des MENA-Eu-Raums?, Bonn, Germanwatch, http://www.krium.de/images/stories/hintergrundpapier_desertec.pdf (10.04.2010)
- Schlütter, D. (2006): Stadtentwicklung, Wassermanagement und Ressourcenkonflikte in Ouarzazate. Eine sozial-geographische Analyse im südlichen Marokko. Dissertation. Bayreuth. http://opus.ub.uni-bayreuth.de/volltexte/2007/270/pdf/Komplettversion_02_02_07_web.pdf (13.04.2011)
- The World Bank (2003): Social Analysis Sourcebook: Incorporating Social Dimensions into Bank-Supported Projects. Social Development Department. Washington, DC
- The World Bank (2011): Middle East and North Africa Region Assessment of the Local Manufacturing Potential for Concentrating Solar Power (CSP) Projects. http://arabworld.worldbank.org/content/dam/awi/pdf/CSP_MENA_report_17_Jan2011.pdf (20.03.2011)

- Trans-Mediterranean Renewable Energy Cooperation TREC (2008): Clean Powers from Deserts. The DESERTEC concept for Energy, Water and Climate Security. White Book. Third Edition. Hamburg
- Trieb, F. and Mueller-Steinhagen, H. (2007): Europe-Middle East-North Africa cooperation for sustainable electricity and water. SUSTAINABILITY SCIENCE 2, 205-219
- United Nations UN (2008): Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision, <http://esa.un.org/unpp>, (10.02.2010)
- United Nations Educational, Scientific and Cultural Organization Unesco (2005): Hydrology for the environment, life and policy (HELP): The IMPETUS Project. http://portal.unesco.org/science/fr/ev.php-URL_ID%3D3730&URL_DO%3DDO_PRINTPAGE&URL_SECTION%3D201.html (13.04.2011)
- United Nations Development Group undg (2003): The Human rights based approach to development cooperation – towards a common understanding among UN agencies. Geneva. http://www.undg.org/archive_docs/6959-The_Human_Rights_Based_Approach_to_Development_Cooperation_Towards_a_Common_Understanding_among_UN.pdf (13.04.2011)
- United Nations Development Program undp (2005): Integrating human rights into energy and environment programming – a reference paper. Geneva. http://hurilink.org/tools/Integrating_HRs_into_Energy_and_Environment_Programming.pdf (13.04.2011)
- United Nations Development Program undp (2010): International human development indicators. <http://hdrstats.undp.org/en/countries/profiles/MAR.html> (13.04.2011)
- United Nations Economic Commission for Europe unece (1998): Aarhus convention on access to information, public participation in decision-making and access to justice in environmental matters. Aarhus. <http://www.unece.org/env/pp/documents/cep43e.pdf> (13.04.2011)
- United Nations Environmental Program unep (1992): Rio declaration on environment and development. Rio de Janeiro. <http://www.unep.org/Documents.Multilingual/Default.asp?documentid=78&articleid=1163> (13.04.2011)
- United Nations Framework Convention on Climate Change UNFCCC (2011): Report of the Conference of the Parties on its sixteenth session, held in Cancun from 29 November to 10 December 2010. Addendum. Part Two: Action taken by the Conference of the Parties at its sixteenth session. FCCC/CP/2010/7/Add.1
- United Nations general assembly (2007): United Nations declaration on the rights of indigenous peoples. Geneva. <http://www.un.org/esa/socdev/unpfi/en/drip.html> (13.04.2011)
- United Nations Human rights unhr (1994): The 1994 draft declaration of principles on human rights and the environment. Geneva. <http://fletcher.tufts.edu/multi/www/1994-decl.html> (13.04.2011)
- Vallentin, D., Viebahn, P.(2009): Ökonomische Chancen für die deutsche Industrie resultierend aus einer weltweiten Verbreitung von CSP (Concentrated Solar Power) – Technologien. Projektbericht, Wuppertal.
- van Cauwenbergh, N., Biala, K., Biolders, C., Brouckaert, V., Franchois, L., Garcia Ciudad, V., Hermy, M., Mathijs, E., Muys, B., Reijnders, J., Sauvenier, X., Valckx, J., Vanclooster, M., van der Veken, B., Wauters, E., Peeters, A. (2007): SAFE – A hierarchical framework for assessing the sustainability of agricultural systems. Agriculture, Ecosystems and Environment, 120:229-242
- Varis, O. and Abu-Zeid, K. (2009): Socio-Economic and Environmental Aspects of Water Management in the 21st Century: Trends, Challenges and Prospects for the MENA Region. International Journal of Water Resources Development 25, 507-522
- Werenfels, I. (2009): Maghreb. In: Steinberg, G. (2009): Deutsche Nah-, Mittelost- und Nordafrikapolitik. Interessen, Strategien und Handlungsoptionen. SWP, Berlin

- Werenfels, I. and Westphal, K. (2010): Solarstrom aus der Wüste. Sinnvoll und machbar?
http://www.swp-berlin.org/produkte/swp_aktuell_detail.php?id=10984&PHPSESSID=dd660c4db383e4d0bc294cbff0efb9 (12.11.2010)
- Wilkinson, R. (2002): The impact of energy infrastructure projects on poverty. A sustainable livelihood analysis. Discussion paper for the DFID. <http://www.practicalaction.org/docs/consulting/energy%20and%20livelihoods%20final%20version%20rew%20mar02.pdf> (13.04.2011)
- World Commission on Dams wcd (2000): Dams and development. A new framework for decision-making. London
- Yang, H. and Zehnder, A.J.B. (2002): Water scarcity and food import: A case study for Southern Mediterranean countries. In: World Development 30, 1413-1430



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