

Renewable Energy in Morocco: Assessing risks to avoid a resource curse

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Short Report

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Renewable Energy in Morocco: Assessing risks to avoid a resource curse

Aniq Ahsan, Alycia Leonard, Flora Charbonnier, and Stephanie Hirmer

Key Messages

- We evaluate 14 potential risks which could cause renewable energy development in Morocco to provoke a resource curse.
- We identify the biggest risks to be economic dependence, technical dependence, and damage to flora and fauna.
- Policy objectives are identified to prevent/mitigate these risks. These are: careful negotiation of robust co-funding arrangements to safeguard Moroccan autonomy; the development of local renewable energy technology capabilities; and continuation and enhancement of environmental protection mandates.



Amogdou wind farm in Essaouira, Morocco [1].

Introduction

In this briefing we evaluate the risk of renewable energy (RE) development provoking a resource curse in Morocco and identify policy objectives which convert risks into development opportunities.

RE is a huge opportunity for economic and social development in Morocco. Morocco has high solar and wind potentials [2] and interconnections throughout North Africa and Europe. High-Income Countries (HICs) are increasingly looking to Low- and Middle-Income Countries (LMICs) with RE resources to import low-carbon energy. This creates a great opportunity for Morocco to combat climate change while creating economic and social benefits. However, there are risks to RE development which could turn this opportunity into a resource curse.

A resource curse occurs when a resource-abundant country paradoxically grows more slowly than resource-poor counterparts [3]. It can provoke a host of negative social and economic “symptoms”. The curse is traditionally prompted by subsoil resources (e.g., oil, minerals). However, with a boom of RE development on the horizon – as many HICs (e.g., Germany) [4] look at Morocco to provide their energy needs – it

is important to assess risk factors for a RE-based resource curse.

Methods

We first examined the typical symptoms of resource curses and identified fourteen relevant to RE development (listed in **Figure 1**) through literature review. We subsequently used key informant surveys to identify which symptoms are likely to be particularly high-risk as RE is further developed in Morocco. Respondents were asked to classify the likelihood of each on a 5-point scale (very unlikely to very likely), and rank the symptoms from highest to lowest potential impact. Twenty-one key informants from a variety of backgrounds (see **Figure 2**) took part¹.

The mean likelihood score and impact ranking for each symptom were rescaled to a relative value between 0 and 1 corresponding to minimum and maximum likelihood and impact respectively (see **Figure 1**). Only symptoms with high likelihood and impact are discussed here; the full paper will go into further detail. Follow-up interviews with ten key informants were used to understand existing policies and assess potential options. Anonymous interview excerpts are inserted to support assertions in the text².

¹ Not all participants answered all survey questions, including questions regarding work experience levels.

² Interviews were conducted in English or French based on the interviewee’s preference. All quotes have been translated to English by the research team.

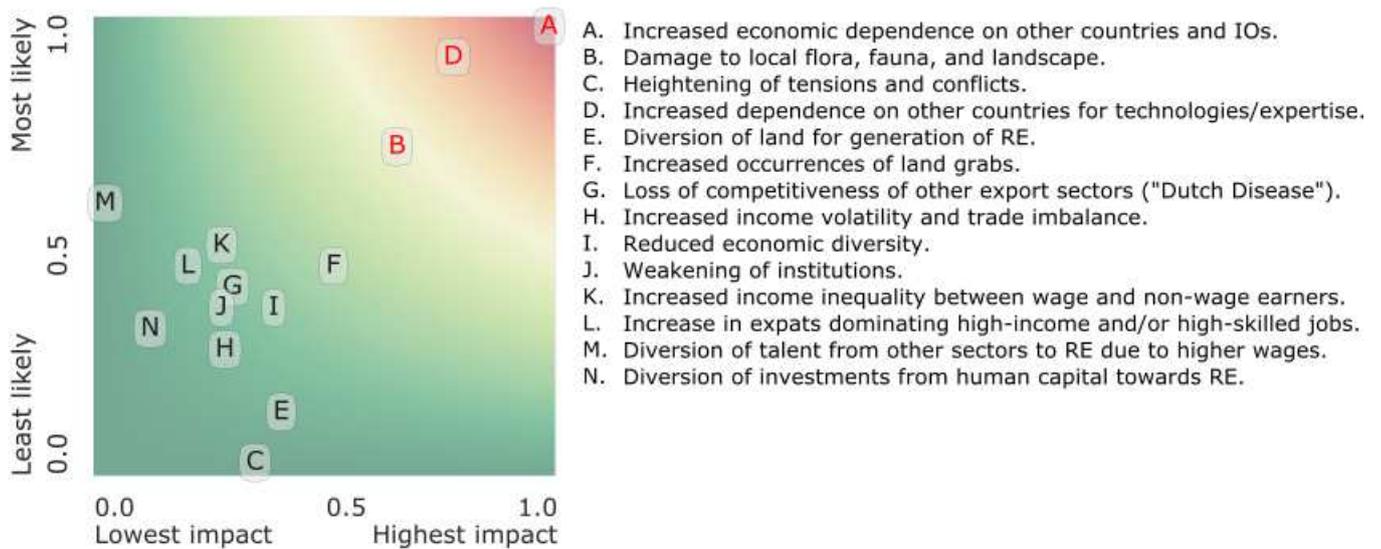


Figure 1: Risk analysis for RE-related resource curse symptoms in Morocco. Symptoms in the top right corner have the highest likelihood and potential impact. The x- and y-axes denote a score relative to other symptoms, as evaluated by the key informants presented in Figure 2. In red are the three symptoms with the highest likelihood and impact consensus. IO: international organisation. RE: renewable energy.

Results

We find the following three resource curse symptoms to have the highest likelihood consensus and impact: (1) economic dependence, (2) technical dependence, and (3) damage to flora and fauna. This is illustrated in **Figure 1**. Details on each follow.

1) Economic dependence

The funding of RE developments can create economic dependence on other countries and international organizations (IOs). Most Moroccan RE projects are co-funded by the government and IOs or banks, in arrangements facilitated by the Moroccan Agency for Sustainable Energy (MASEN) [5]. Morocco has historically taken loans from various IOs (e.g., \$237 million from the Arab Fund for Economic and Social Development [6]). If Morocco funds RE projects using loans, it could become economically dependent on other countries or IOs. As RE is likely to be a large source of income and a big job creator, the welfare of Morocco’s people may also rely on these investments.

"Renewable energy projects in Morocco are partially financed by international banks, partially financed by the Moroccan state. There is a risk of misappropriation of Moroccan state finances. Funding for infrastructure, social projects and health could be diverted." (I3)

Given the stiff competition between countries and projects for RE investments, there is a heightened power imbalance between investors and countries like Morocco. This creates the risk of being subject to political influence resulting from economic dependence.

"When you are not a superpower, you cannot claim that national policy is not influenced by foreign policy" (I5)

While foreign capital has the potential to interfere with Moroccan autonomy, there is an appreciation of neo-colonial risks. Moroccan NGOs [7], for instance, have been able to maintain their autonomy by choosing their funders. Our key informants share these sentiments about Moroccan RE development:

"There is no longer capital rule as in oil countries (in the 20th century), when you could do what you want. There is a spirit of the 21st century. In Morocco, it is no longer possible for capital to arrive and dominate; we no longer accept this." (I2)

2) Technical dependence

RE development can provoke increased dependence on other countries for RE technologies and expertise. While Morocco has existing research institutions and community enthusiasm for RE developments [8], it has less capacity for technology manufacturing [9]. This has led to some dependence on external companies which manufacture Morocco’s RE technologies:

"The government had policies for industrial integration, but they have failed to live up to expectations. There was supposed to be a transfer of technology between external companies and Moroccan companies. However, large international companies were brought in to build solar power plants almost as if it was a transaction. Moroccan companies did not really learn deep technological skills. Local companies were able to learn and perform less specialized and technical jobs, or 'supporting' jobs." (I1)

Technological dependence has historically been an issue for LMICs [10]. There is a spectrum of capability deficits, ranging from LMICs only having capabilities in operations and maintenance through to more

extensive capabilities in independent innovation and product development (see [11]). Technological dependency can be seen, for instance, in Chinese nuclear technology in Pakistan [12] and infrastructural developments throughout Africa [13].

For Morocco, the development of in-country RE technology manufacturing capacity can turn this risk into an economic opportunity. This may also require improvements in sectors like education.

"We don't have the expertise and the technology ... technology and industrial integration remains limited, even though it is increasing. We have real problems in research and the education system in Morocco, and in the integration between research and the business world. We are trying to change this situation, but it will not be done in one year." (I8)



Figure 2: Work experience levels and occupations of the key informants who participated in the survey¹.

3) Damage to local flora and fauna

The development of RE infrastructure can cause environmental degradation [14] and habitat loss [15]. Spill-over effects of RE production along the supply chain can have severe biodiversity impacts [16, p.6]: "generating the required technologies and infrastructure will drive an increase in the production of many metals, creating new mining threats for biodiversity". While the mining of materials for RE technologies is likely to be primarily carried out in other countries rather than Morocco itself, the development of in-country RE farms still holds risk to flora and fauna.

Though the deserts and mountains often used for wind and solar development in Morocco are commonly seen as unproductive land ideal to exploit [17], they are a valuable part of the natural world. Moreover, Morocco is home to nomadic pastoralists whose

traditional land-based knowledge [18] could be threatened by RE development.

"Zero risk doesn't exist, there will be an impact [on the ecosystem]. However, we do not work blindly. ... The desert is not entirely deserted." (I2)

Additionally, Morocco has water scarcity which RE could worsen. Exploitation of the environment has been observed in Moroccan mining [19]. Similar exploitation could be replicated in RE.

Environmental Impact Assessment is typically required for Moroccan RE projects by either IO funders [e.g., 20] or regional investment centres. Morocco has strong policies on water use, from law 10-95 [21] to the National Water Plan [22]. Nevertheless, the policies could still be strengthened and better enforced. Key informants highlighted that there can be win-win situations for local populations by designing RE developments that account for water scarcity:

"We do care about our environment. It's the only asset we have for these kind of business models. ... Water makes living creatures live, but also makes industry live. In Morocco, we have water scarcity in some regions. Unfortunately, those are also the best locations for these plants. In this case, the mitigation is desalination. ... The ocean is really very convenient for this. We can oversize the desalination capacity to provide water for local communities and agriculture." (I4)

Recommendations

To prevent and mitigate these high-risk resource curse symptoms for renewable energy (RE) in Morocco, the following policy objectives are recommended.

1) Negotiate robust co-funding agreements to safeguard long-term growth and autonomy.

Morocco should seek multiple co-funders, ensure those co-funders are politically neutral, and negotiate mutually beneficial terms. This will minimize the influence of any one foreign entity in Morocco. Robust funding agreements can help to ensure that only Moroccan state funds allocated to RE are used, preventing any fund diversion from other social portfolios.

2) Develop innovation capabilities for RE.

This will not only reduce Morocco's reliance on foreign entities for state-of-the-art RE technologies, but also generate high value jobs in Morocco. Improving manufacturing and test-bedding capabilities could create many jobs. Building innovation capabilities in firms, universities, and other institutions can also allow Moroccan companies to grow independently.

3) Continue, strengthen, incentivize, and enforce Environmental Impact Assessment.

Solar and wind currently accounts for about 13% of Morocco's domestic electricity supply [23]. The Moroccan Agency for Sustainable Energy's (MASEN)

mandates have been successful in minimizing environmental impact and land-use conflict due to RE in Morocco. However, RE production in Morocco could increase by orders of magnitude as it increasingly

exports RE. This will increase land scarcity and economic incentives to overlook current protections. Existing policies need be updated and strengthened as the pressures to exploit the environment increase.

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Notes

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