Wind Energy and local community perceptions

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Abstract

Portugal has seen in recent years an increased growth of wind farm's deployment in its northern region, in accordance with national legal framework and current energy policies. The majority of existing academic studies approaching impacts (benefits or costs) resulting from deployment of this technology, mainly focus these aspects from a global point of view, nonetheless wind power projects have also been associated with significant impacts directly affecting local communities where they were implemented. This paper aims to identify such local impacts, reflecting local community's perspective through the use of interviews. A comparative analysis of the main impacts and the way they are being perceived by the local stakeholders, with previous studies focusing this area of expertise was attempted. Results demonstrated that the majority of interviewees did not point out disadvantages that significantly altered their quality of life, revealing a consensual acceptance of benefits from these projects. The major importance of this sort of energy investments and of associated benefits was recognized. Revenues attributed to Communal Land Commission, in charge of managing the land destined to wind farm deployment, were perceived as highly favorable, allowing to answer local community's needs.

Keywords: Wind Power; social impacts; local sustainability.

JEL Classification: Q20; Q42

Introduction

Europe is facing nowadays one of the greatest challenges concerning energy sector; the continuous rise of energy prices along with a high level of dependency on "energy imports" jeopardizes countries "security and competitiveness" (European Union, 2011a). The use of Renewable Energy Sources (RES) has been seen as an effective way to tackle this problem, and particularly wind energy, being considered one the foremost promising technologies, currently contributing to generate an available greener and ever more competitive electricity system (European Union, 2011b).

Similarly to the European scenario, Portugal's energy scenario has been characterized by considerable dependence on external energy resources, mainly due to energy system's reliance on fossil fuel derivates (oil, natural gas and coal) (Portuguese Directorate for Energy and Geology (DGEG), 2012).

In order to reduce Portugal's external energy dependence, while increasing energy efficiency and reducing CO_2 emissions, national government has developed strategic guidelines for energy sector stimulating the contribution of RES, focusing among others on wind energy (Institute of Systems and Computer Engineering of Oporto (INESC Porto) and AT Kearny, 2012). The investment in such option has revealed a positive outcome, since wind energy currently represents a key aspect in national energy context, with increasing deployment throughout national territory (Institute of Mechanical Engineering and Industrial Management (INEGI) and Portuguese Renewable Energy Association Wind Farms in Portugal (APREN), 2011). These authors further underlined that over the last decade, RES has taken an important role in "national energy mix", particularly with the "increasing number of wind farms" located in national territory. This assessment has emphasized the "fundamental role RES played for the reduction of the external energy dependency, actively contributing to increasing the security of supply" (Ferreira, 2007:17).

The proposed work aims to address the local and regional social impact of wind energy projects, focusing on developing a methodology to assess them from a stakeholder's perspective, applying it to a Municipality or Village case study. Public insight has been gathered through qualitative methodology, since it enables to better capture its changing character, influenced by several variables including "geographical, temporal, socio-political or cultural contexts" (Aitken, 2010:1835), capturing information that otherwise would be omitted, making it appropriate to establish relationships at a local scale (Del Rio and Burguillo, 2009). A theoretical framework was developed helping to define several steps of a dynamic nature that ultimately lead to interviews with different local stakeholders. The adoption of such strategy has facilitated the accomplishment of abovementioned aims, i.e. demonstrating the major impacts perceived by the stakeholders and the benefits or social costs ascribed to RES projects.

Social research of Wind Power Projects

A recent literature review concerning social issues and qualitative research methodologies in RES projects, showed that despite the increasing relevance of the theme, social dimension is far from being fully explored. Mainly because as Ribeiro; Ferreira and Araújo(2011) have stated economic as well as environmental issues, are more easily measurable, being addressed more extensively than the social concerns.

Nonetheless, social aspects have been analyzed from a global scale, generally focusing on employment generation; community funds and partial project ownership.

According to several authors (Sastresa, Usón, Bribián and Scarpellini (2010); Allan, Mcgregor and Swales (2011); Blanco and Rodrigues (2009); Del Rio and Burguillo (2009) and Cuartas and Menéndez (2008)) one of the most common social aspects, within RES projects is the positive impact as far as employment generation is concerned. Notwithstanding, Del Rio and Burguillo (2009) also underlined that, for rural communities, other aspects (namely payment of rents and investment in the educational system) should not be overlooked, ultimately contributing to increase local social welfare.

Although community benefit schemes have been considered a common practice in RES projects, it is still not a formal institutionalized practice (RenewableUK, 2011). Despite this, a recollection by abovementioned author, showed the nature of different benefit schemes, encompassing social, economic and environmental areas, as being a positive rapport between the promoters and local stakeholders.

Munday, Bristow and Cowell (2011) suggested that RES project ownership might increase the socio-economic outcome in rural areas. Allan et al. (2011) considered this option as being vital to ameliorate socio-economic standards in regions that such projects were implemented, implying that, community benefit's positive effects were even stronger when combined with "shared-ownership scheme", overshadowing one of the most focused aspects within social research, the employment issue, registering a considerably minor effect.

Methodology

Methodology has been viewed as being essential to define a research study. To develop a successful field social research investigation it is necessary to have an integral perception of what it entails. Rubin and Babbie, (1997: 94) stated that viewing research process holistically has been fundamental to "create a research design". Despite the research strategy adopted, the most important issue is that it should allow answering the research question and attending its main purpose (Saunders, Lewis and Thornehill, 2007). The main goals of the investigation were expressed in the form of a research question: "What are the main social impacts (positive and negative externalities) of RES projects implementation, from a stakeholder's perspective?", which led later along the research process to focus on "how are those social impacts being perceived by focal stakeholders?".

The main questions of what is considered important and how it is viewed by the interviewees, were answered by following an integrated research design featuring interpretative insight, along with an exploratory research purpose applied to a case study scenario. In order to obtain an accurate description and interpretation of social phenomena from the perspective of the stakeholder, semi-structured in-depth interviews were selected. This technique was viewed as being appropriate due to its flexibility characteristics, allowing to achieve a detailed account of social impacts (King, 2004). A known advantage for the use of such qualitative methods in "exploratory research" has been, according to Mack, Woodsong, Macqueen, Guest and Namey (2005: 2) that by employing "open-ended" questions participants tend to "bring out rich and meaningful answers, that were not expected by the researcher".

Case Study Characterization

The case study was developed in a rural area, located in the north region of Portugal, a region characterized by the high density of wind turbines, as shown in Figure 1.

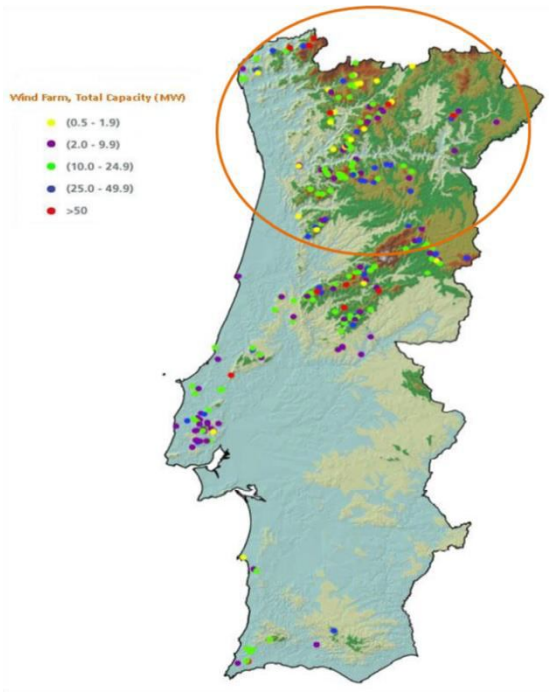

Figure 1 - Case Study location area. (Source: adapted from INEGI and APREN, 2011).

This has been an area associated to wind power deployment since the late 1990's, and currently has a few projects in different stages of planning process, totalizing over 30 RES projects. Effectively Portugal has in recent years, invested in RES projects for a cleaner electricity production, backed up by national policies and legal framework.

In order to assess the potential socio-economic benefits at a regional and local scale, a case study was developed focusing a specific segment within stakeholder's universe. Because wind

turbines have been or will be installed in communal ground, which management is delineated by legal resolution nº 68/93, implying the institution of Communal Land Commission Councils, selected research participants were representatives from these same Commissions. This focal group was considered ideal for exploring local impact from RES projects because they have been present throughout the entire negotiation process and, represented a link between other key players, namely RES promoters and local population. This approach is expected to allow recognizing what both parties brought to the table, despite not being able to interview all focal stakeholders.

Although current legal framework established that 2,5% over total energy generation, income from a wind farm should be assigned to the local municipalities, other benefits derived from wind farm projects were also discussed with local community, namely with Communal Land Commission Council. Discussing with stakeholders this negotiation process directly contributes to answer proposed research questions, regarding what are the main impacts and how are they being perceived. Overall within stakeholders group, focused participants given their positions, and due to their responsibilities had a good knowledge of local reality, despite having different professional backgrounds. Most backgrounds ranged from three of the most preeminent local activities, such as construction workers, farmers or shepherds to engineers, accountants, bank account managers, contributing to diversified perceptions of wind energy deployment.

Further considering population characteristics, "target area" has an estimated average of 13.200 resident population, with focused villages having about 150 to 300 permanent local residents. Being a typical emigration area, population tends to increase during certain periods, especially during Summer time. This region could be described as having "disperse population" distribution, with a pronounced declining pattern due to above mentioned reason, as well as an increasing growth of elderly population. According to the latest statistic survey, Census 2011, National Statistics Institute (INE) (2012) the Portuguese aging population has increased circa 19% over the last decade, now reaching 2,023 million people. Of this universe the highest percentage (about 31%) of people over the age of 65 is currently concentrated in the northern region of Portugal (INE, 2012), coinciding with the selected study area. The cited characteristics, along with other factors such as the reliance on "agricultural subsidies" (Del Rio and Burguillo, 2009 and Munday et al., 2011), or the "high unemployment rate" make these areas ideal for RES project's development.

Results

Regarding positive impacts stakeholder's perceptions are till a certain extent, coincident with literature review undertaken. Most mentioned benefits are consistent with some of the identified categories for benefits schemes adopted by Sustainable Energy Authority of Ireland (SEAI) (2011: 60) and RenewableUK (2011) which included "community funds", "benefits in kind", "project ownership" or "local employment" (see Checklist 1). Allowing to establish a comparison and potential corroboration of obtained results versus other developed works.

Nonetheless, within stakeholder's statements, different perspectives regarding social issues were encountered distinguishing them from previous studies.

Despite such discrepancies, overall most participants viewed this investment as positive for local communities, registering both direct and indirect benefits (see Figure 2).

Regarding negative impacts, it is interesting to underline that all participants in the interview processes claim that none of the represented commissions ever received complaints regarding negative impacts from wind energy parks. Despite this, stakeholders did have many concerns regarding environmental, social and economic aspects (see Checklist 2), that were approached during negotiation process with project developers. Here similarly to what was verified with community benefits, there has been divergence in obtained answers.

Checklist 1 – Most mentioned impacts within categories of community benefits schemes (own elaboration).

Category	Most mentioned impact	Interview Subjects						
		1	2	3	4	5	6	7
Community Funds	- Regular payment (annual rent)	*	*	*	*	*	*	*
Benefits in kind	- Accessibilities provision or improvement	*	*	*	*	*	*	*
	- Social Equipments	*	*	*	*	*	*	*
	- Facility enhancements (repair local buildings)			*	*			
	- Environmental improvements (reforestation)		*	*		*	*	*
	- Wood supply to Commission members							*
	- Rental of local buildings	*						
	- Invest in other commercial activities (tourism)			*	*	*		
	- Donations			*		*		*
Project Ownership	-	-	-	-	-	-	-	-
Local Employment	- Local labor supply for construction phase						*	
Direct:	- Local labor supply for operational phase	*		*				
Indirect:	- Local labor supply for investment in social equipment	*	*	*	*	*	*	*
	- Local labor supply for investments in environmental improvement			*				

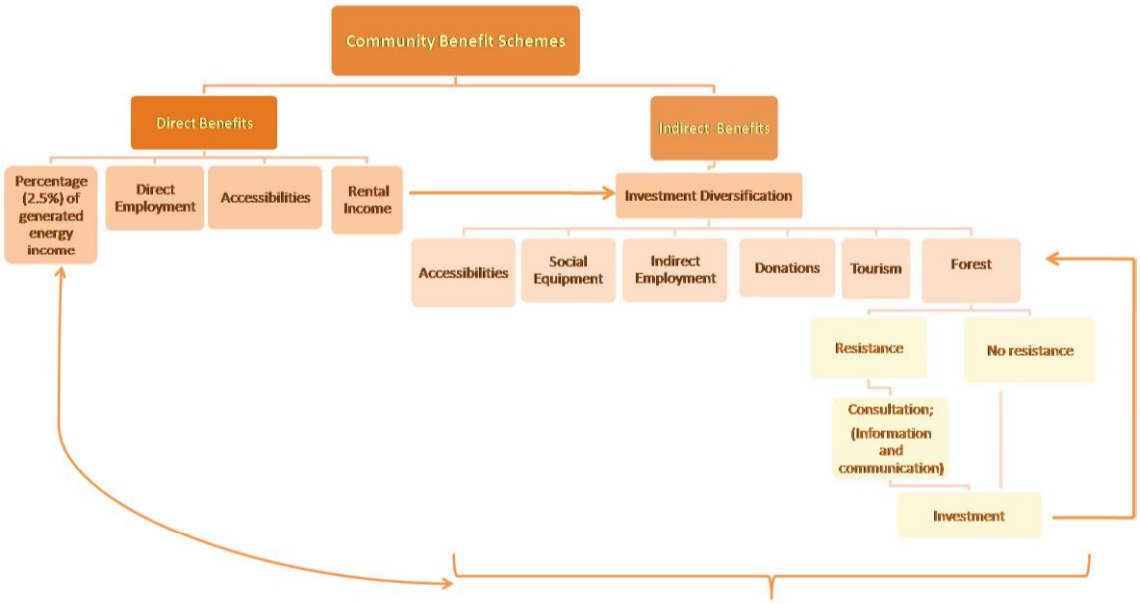

Figure 2 – Main direct and indirect benefits attained by wind power deployment (own elaboration).

Checklist 2 – Main referenced concerns with adverse impacts perceived by interviewees (own elaboration).

Category	Main Referenced Concerns						
	Interview Subjects						
	1	2	3	4	5	6	7
Landscape and visual impact	*	*	*	*	*	*	*
Noise emission impact	*	*	*	*	*	*	*
Wildlife impact	*	*	*	*	*	*	*
Land occupation and usage impact	*	*	*	*	*	*	*
Shadow flicker effect	*	*	*	*	*	*	*
Electromagnetic interferences	*	*	*	*	*	*	*
Socio-economic impacts:							
- Property value	*	*	*	*	*	*	*
- Cattle grazing	*	*	*	*	*	*	*
- Farming	*	*	*	*	*	*	*
- Tourism	*	*	*	*	*	*	*
Water resources impact	*	*	*	*	*	*	*
Air quality	*	*	*	*	*	*	*
Carbon footprint	-	-	-	-	-	-	-

*No impact
*Impact not negatively perceived
*Impact negatively perceived
- No information available

Discussion

Additional revenues have been mentioned by a large majority of interviewees as being the main advantage, when asked about main benefits, all interviewees reported community benefit funds as the first positive outcome for their villages, along with some benefits in kind, mainly providing or improving access roads. Checklist's 1 distribution of obtained answers accordingly to established criteria, reflects this tendency, being supported by Interviewee 2 quote: *"The main advantage for us is the financial benefit that is a compensation they give us resulting from the usage of land (baldios). Then we also have infrastructure improvement, since to access wind farm location, developers have to provide accessibilities, which is also reflected as a positive outcome for local community."*.

The main contradictions with existing literature (Munday et al., 2011 and Del Rio and Burgillo 2009) have been associated to other categories. Benefits in kind, for instance reforestation and indirect employment generation seem to prevail over other types of community benefit schemes more evident in previous studies (Munday et al., 2011; RenewableUK, 2011; SEAI, 2011 and Allan et al., 2011), such is the case of direct employment generation and project ownership.

Investments have been focused mainly towards day care centers for elderly people, reflecting a recurrent theme mentioned by research participants associated to increased aging of local communities. Interviewee 5 expressed it better when he said: *"(…) our biggest benefit was on a financial level, because it allowed to invest in new infrastructures and to improve others already existing. Before this would not be possible because we lacked income. These are remote areas, that do not have that sort of funds."*.

The extent of the potential impact of these projects in both social and economic dimension is adequately described by Interviewee 5: *"(…) here the little income we had was from the forest, there was no other source of income. We were talking about a yearly sum around 2 to 3 thousand euros, and now we are talking about 40 to 50 thousand. It is a very big difference."*.

For the most part of the stakeholders, employment generation has been associated to the way generated income is managed and redirected towards other investments, i.e. it has an indirect nature. These results reflected that indirectly generated employment should be emphasized, demonstrating a wide level of implementation contributing to local welfare, contradicting Del Rio and Burguillo (2009) findings, predicting enduring indirect jobs were probably very scarce. For example, Interviewee 2 gave an example of a nearby village that was very much undeveloped, and due to wind park implementation has now a retirement home that employed a total of about 18 people, making a substantial difference in an isolated rural area with social issues, namely aging and emigration of population as well as limited employment prospects.

Throughout the interviews certain underlying themes were identified, mainly related to information accessibility and communication of knowledge that ultimately influence in a positive or negative way the negotiation process, as well as the management process of attributed benefits. Relationships between local community's perceptions and acceptance of prospective investments were found. The complexity of such relationships was evidenced by obtained results regarding potential application of wind energy funds to forest resources, where respondents had conflicting views either willingly and consciously accepting this proposal or opposing it, preventing its application. Such resistance illustrated in Figure 2, is a consequence of a combination of socio-economic and cultural background allied to misinformation and miscommunication issues, implying negative aspects that cannot be dissociated from these benefits. Although the improvement of accessibilities reducing the risk of fires has been widely regarded as an asset, the initial foreseen prospect of a broader level of support and openness towards the idea of endorsing forest resources was bellow expected, due to registered divergences.

According to Interviewee 1 it has been quite challenging for some community members to accept reforestation, since grazing is a very ancient and typical activity. Within the group less supportive of projects that stimulate forest rehabilitation and its by-products, the abovementioned motivation was considered pivotal. However, another interesting fact for this attitude was given, suggesting a deeper reason for this lack of support and drive to revitalize this local resource. Still according to Interviewee 1, history played a major role in the current state of mind *"(…) we have a rural economy, and we have to make it profitable. But people are not aware of that. Before 1940's the management of this common land was directly made by local villages and everybody raised cattle, my family alone had a herd of about 400 animals (200 goats and 200 sheep), back then the government forced local population to sell their livestock and forested pasture areas. With implementation of democracy in 1974, there was a denial towards the forest, with people setting fire to previously forested areas. Regarding this issue, there is a negative rapport between local communities and communal land, and the sensation that there is still an injury that has not healed. People have to feel motivated to preserve and invest in this resource and only after that, they will have profit, meanwhile there is a lot of work to develop in order to raise awareness (…)."*.

In other cases, where communities were more aware and forest driven, acceptance and acknowledgment of forest investment was more prevalent. Respondents recognized that due to past activities, villagers were more alert to the importance and significance of the forest. This is the case of Interviewee 2*"(…) people in my village are highly conscious of forest related issues, since most of them worked precisely in the forest. Back then there was what they called the arboretum, a forest house, and about 80% of the village population worked there, from a very young age (14-15 years old) they had to leave school and work, also dedicating themselves to raising cattle. Therefore, for them a tree is like an asset."*.

Obtained statements have also underlined on one hand how crucial timely access to accurate information is to influence the outcome of contract negotiation, potentially contributing to beneficiate local communities, as well as the need to ensure stakeholders access to accurate information in order to make up their minds, and therefore deliberate about prospective opportunities. As admitted by interviewees 7 and 1: *"(…) our negotiation process was not very*

elaborate, we did not have negotiation skills for it. They arrived and offered a certain value per wind turbine, but we are not equipped to perceive if the amount is adequate or not (if it is very high or very low). (…) besides the promoters being very available during negotiation process, we did not have the knowledge to make that deal. (…)" (Interviewee 7).

For Interviewee 1 *"(…) but it will be a difficult task to change mentalities. (…) currently people only think about short term investment, they don't have the perspective of long term investment, and I am referring to forest investment. People haven't seen yet the forest as an asset, or maybe as one of the biggest sources to generate profit and richness. Nowadays people view investment as applying revenues in local improvements (social equipment or accessibilities), that in my opinion will not have a return profit as interesting as the forest. I really think the secret here is to re-invest in the forest and people have not got that sensibility yet, so they do not see it as an objective, they do not make the proposal and do not vote for it. A lot of work needs to be done in order to raise awareness and motivate people to invest in the forest as a way to provide income, because this resource generates a lot of direct and indirect benefits. Besides biodiversity and other environmental issues, the forest creates many local jobs in several areas, such as tree resin, wood, mushrooms and honey. Therefore it's an asset that local population should take advantage of."*

On the other hand, Interviewee 3 mentioned *"(…) most of the population are aware of the value and need to make forest investments, but I am not saying all of them are, because that depends on the board of directors of the commission that changes from one locality to another." "(…) in my case, people are aware that we need the forest, and local population is so sensitive about this issue, that a local association was founded. At first there wasn't any income, but now that we have it, we are going to make business with all forests by-products (biomass, tree resin, wood, mushrooms and honey). We are currently studying the possibility of exploring the potential of biomass and analyzing proposals made to the local forest association. Consequently we are going to develop more, because the forest gives back in many ways and that is why I re-invest some of the money from wind farms in the forest.".*

Taking into consideration Interviewee 3's abovementioned statement, regarding future prospects and sustainability issues, comparatively to previous studies (Del Rio and Burguillo, 2009), largely due to the effort developed by commission councils, the tendency followed by benefit investments favoring diversification has been helpful to reconvert local rural economy, since indirectly opportunities are being developed to contribute to create attractive conditions to settle young population in the region. If this tendency is kept, a positive outcome could be perceived as far as wind farm potential contribution to mitigate desertification issues. However, as registered in other aspects focused in this case study, opinions seem to be divided, with other interviewees considering wind farms as being isolated investments, with needs regarding employment generation, considered essential to attract population to rural areas, as being very limited in time, associated to its construction phase. As mentioned by Interviewee 2: *"These investments require temporary construction work and then during operational phase they need maintenance. This maintenance will be made by a minimal number of qualified workers. Therefore I think that this is not a relevant contribution to decrease desertification."*.

According to Interviewee 7 point of view, in order to promote local socio-economic potential, it is necessary to ensure other types of benefits:*"(…) for me, this sort of investment would have a real benefit for the region, if benefits were in terms of local energy supply. For instance, if the energy is produced locally, why do not we have free energy supply, or cheaper energy bills? It could make a big difference. (…) or if it brought jobs to local economy (…) certainly even people that moved out to more urban areas, would come back to the village.".*

Regarding negative impacts, similarly to what was verified with community benefits, there has been divergence in obtained answers reflecting to some extent a problem with incomplete knowledge and also the recognition by research participants that benefits have a significant weight against potential negative impacts, which inevitably conditions its perceptions. Most of the negative impacts were either not verified or verified but not negatively perceived in this case study. For instance visual impact was according to some interviewees not verified due to wind farm location and substantial distance to residential areas or verified but not negatively perceived. Research participants also showed interest and concern over some aspects, namely impact on local economic activities; noise emissions and land occupation and usage (see Checklist 2).

According to Interviewee 1 *"(…) in our case, I do not think we will have visual impact because wind parks are located very far away from the village (about 3km). From residential areas it will not be even possible to see it. We (village) are located in the lower part of the mountain, and the wind park at a very long distance on top, therefore it will not be visible (…)"*.

Mostly interviewees claimed not having suffered of noise pollution, nonetheless measures were taken reduce its negative effects. For instance, Interviewee 3 claimed that special care has been taken to control noise emissions during certain periods of day, to avoid interference with highly ecologically sensitive areas. With a contrasting attitude to the rest of the interviewed group, Interviewee 7 stated that although no complaints by local community have ever been reported concerning this issue, he in particular considers his village is somewhat affected by noise emissions, being influenced by the prevalent wind direction.

Interviewee 1 highlighted that the development and maintenance of road accessibilities was a benefit that unveiled some disadvantages in terms of soil degradation and mobilization: *"Initial benefits such as development and maintenance of existing accessibilities were a positive addition, especially considering firefighting. But often these side roads end up having a negative effect on mobilization and soil degradation while having a positive effect as a barrier for fire propagation."*.

Although according to Interviewees 3 and 5 potential adverse effects on existing water lines used for agriculture, was one of the main concerns of local population during negotiation process. For Interviewee 1 most people regard land occupation as being confined to wind turbines space, when in fact this impact has a much more widespread effect than initially supposed by public opinion. This attitude is a response to the underlying lack of information that gives them a partial perception of reality, and not enough sensibility and awareness to identify *"one of the negative impacts resulting from development of accessibilities."*.

However the main drawback, according Interviewee 6, to has been associated to the gap within local community members. In this case study mistrust within stakeholders is promoted by economic interests associated to community benefit schemes attribution and the way they are being managed and re-invested. This conflicting behavior often leads to legal battles over who is entitled to manage and usufruct of the advantages of RES projects, defrauding a broader sense of community that has been patent in various interviewees answers, constantly focusing on community as a hole unit, and trying to suppress their needs instead of favoring individual parties: *"(…) it is one of the disadvantages, if not the biggest disadvantage from wind farms, it generates conflicts within local community, when ulterior economic interests are identified. (…) In our case, the old manuscripts describe this area as a common area destined to animal pasture, which was back then the main source of income connected to these mountain areas. One of the stakeholders (another village) did not see it that way, and went into negotiation process without consulting any of the other parts, which lead to the existing conflict (…)".*

These statements illustrate the fundamental need to incorporate local community members in all aspects of wind energy projects, in order to obtain public consent constituting an opportunity to incorporate suggestions made by them, further adjusting benefits to local needs, since proposed suggestions come from people with local knowledge.

Conclusions and Future Remarks

Although the relevance of wind energy's role towards a more sustainable energy system has been thoroughly recognized, with several case studies displaying impacts from its deployment, very few case studies have focused social dimension at a local scale, resorting to an exclusively qualitative methodology. This work aimed to develop such an approach and contributing to determine what were the main social impacts at local level from stakeholder's perspective.

To achieve the proposed research objectives a participative methodology supported on a case study selection and stakeholders interviews was designed and implemented. The intricate established research design allowed to, throughout its different phases refine and refocus the interviews towards crucial subjects, essentially based on focal stakeholder's perceptions. This aspect was extremely important, allowing to further establishing how those impacts were being perceived, ultimately leading to a logical understanding of obtained data.

The results heightened the relevance of local social and cultural aspects when addressing benefits or social costs ascribed to RES projects. The main social aspects of RES research were identified, as well as the nature of the issues that led to the obtained answers, while simultaneously establishing a comparison with other previous studies.

Most of the research participants declared themselves in favor of this type of investment. These opinions seem to be mainly driven by the perceived benefits resulting from wind farm deployment. The interviews outcomes denote a similarity between the main types of social benefits identified in literature review, yet with significant differences as for distribution within each type, emphasizing indirect employment, the use of benefits in kind, reinvestment of

obtained revenues and non-applicability of project ownership. These discrepancies have illustrated how challenging can management of community benefit schemes be, being in this case mainly connected to an identified mix of cultural background, misconception and misinformation issues deeply rooted on local traditions. Denoting the need to adopt a widespread integrative solution involving various stakeholders within negotiation process, in order to achieve a more consensual, future length appropriate outcome, reinforcing the importance of local community perception's to achieve local sustainability.

The presented case study revealed a consensual acceptance of the benefits of these projects but the validation of these results and their representativeness on National scale can only be achieved if the work proceeds with the analysis of other regions and even of other less consensual technologies. The implementation of the proposed participative methodology to other case studies would be a particular benefit providing new insights to both the scientific field of social impact assessment and to the sustainable energy decision making. The proposed future work should further help determining if local characteristics (considering both existing natural and social resources) bear some influence over the way community benefits are spent, implying a pattern in terms of its future investment; or if a different dynamic between focal stakeholder´s interaction would result in more innovative and diversified projects entailing a much more significant contribution towards sustainability of isolated rural communities.

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