Spatial analysis of the appropriation of electrical renewable energy technologies and sustainable development in the Upland of western Cameroon

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Abstract. The Cameroon rural western highlands, like most of the developing countries, undergoes a lack of electrical energy supply to make easier the lightning and the supply of tiny industries. During the last decades, the future of the technologies of renewable energies (Micro-hydroelectric power plant, photovoltaic panels, and micro wind tribune) is remarkable in the region. From this report, this study aims at analysing the installed capacities of those emerging technologies in order to determine the approbations degree of the local community and their influence on the sustainable development of the region. The primary and secondary data are obtained by the method of hypothec-deductive and mainly by snowball method, enabled us to evaluate three main types of renewable energy technologies in the region. The micro-hydroelectric power plants are the most important in terms of installed capacities. They are evaluated to 4936.7 KW (including the capacities of the colonial periods), an increase of 423.7 KW compared to 2014. The photovoltaic panels, which are the most prodigious one, are evaluated to 1070.362 KW, an increase of 936,47KWc. The micro wind turbines, which partially exist, are evaluated to 24.850 KW, an increase of 15.45KW. The analysis of the spatialization of these emerging technologies in this region shows a spatial and temporal growth of these technologies that testifies to their appropriation in the Western highlands of Cameroon. Key words: Electrical renewable energy technologies, sustainable development, improvement of life, uplands, Western Cameroon.

1 Introduction

Appropriation according to the Larousse Illustrated Dictionary 2012 is "to adapt something to oneself and transform that thing into a medium for self-expression". Renewable energy technologies are those that harness clean energy sources that renew themselves on a human scale. Their presence in the highlands raises interest in this area. The Cameroon western highlands are extended to three regions namely: The West, the Northwest and the Southwest. On the administrative view, the region of the West is subdivided into 8 divisions and is dwelled on the superficies of 13 892 km². The Northwest region comprises 7 divisions and is dwelled on 17 300 km². The Southwest region on its turn is subdivided into 6 divisions and covers a superficies of 25 410 km² (BUCREP, 2010). The needs of electrical energy are very relevant in these 3 regions because they are large in manpower resources. The West region comprises 1 720 047 inhabitants, and the density of 123, 8 htc/km². The region of Northwest has 1 728 953 inhabitants and a density of 999 hrs/km². The Southwest region has 1 316 070 HT, that is 51, 8 HTS/km² of density (BUCREP, 2010). Since the late 1990s, the diffusion of the electrical Renewable Energy Technologies (RET) has been favoured in that region in particular and in Cameroon, on the one hand, thanks to the enforcement of the law n°90/053 of the December on the freedom of association and, on the other hand, due to the liberalisation of the electricity sector which is materialized by the promulgation of the law n°98/022 of 24 December 1998 concerning the sector of electricity. Since then, we can notice the proliferation of these technologies all over the region. Hence the interesting asking how evolves the emergence of electrical RET in the Uplands of the western Cameroon. In other words, what is the implemented capacity of each type of RET in that region? In that perspective, a spatial and temporal analysis of these RET in that region introduce us to the hypothesis according to which the micro power station hydroelectric, the voltaic panels and the micro windmill are relevant to bring a substantial contribution to the sustain development in the Uplands of the western Cameroon.

2 Methodology

To achieve the desired results, the methodology used is based, on one hand, on the analysis of secondary data obtained by article exploitations taken from the internet and libraries. That said, our stay in the Western Region allowed us to exploit the documents of the highland research center (CEREHT) of the University of
Dschang, the library of Civil Engineering at the Faculty of Agronomy and Agricultural Sciences (FASA) of the University of Dschang, the central library of the University of Dschang, and the library of the NGO ACREST allowed us to identify key documents for energy research.

In addition, the library of the Ministry of Scientific Research and Innovation (MINRESI) in Yaoundé, the central library of the University of Yaoundé I, the library of the Faculty of Arts, Letters and Humanities (FALSH) of the University of Yaoundé I, the SNV journals, the documents of the Ministry of Water and Energy (MINEE), the Ministry of the Environment and Sustainable Development, also allowed us to properly identify our problem during our stay in Yaoundé. Our stay in the North-West and South-West enabled us to obtain documents and information from the regional delegations of the MINEE and from NGOs working in renewable energy.

Finally, the Eugen Ionescu grant gave us the opportunity to exploit the documents of the Geography library at the Alexandru Ion Cuza University in Iasi, Romania, the library of the French Institute in Iasi, Romania. It also allowed us to familiarize ourselves with internet research where a large number of books on the subject of renewable energies were downloaded using mainly the Google search engine.

On another hand, the methodology is based on the analysis of primary data obtained by direct observation, which consists of field visits to collect data through interviews, interview guides, questionnaires, focus groups, visual field and resource person interviews. Thus, we used the stratified sampling technique, which consists in taking a sample from a research population by randomly drawing within subgroups (or strata) made up of elements with common characteristics. This made it possible to sample the localities studied. That said, not all the departments of our study area have been studied by direct and participatory observation due to a lack of financial means. In the West region, all the departments were studied. In the North-West, region, four departments (Bui, Mezam, Momo, and Ngo Ketundja) over seven were studied. In the South-West, three departments (Koupé-Manengouba, Lebialem and Fako) were studied. However, to remedy this situation, we proceeded by indirect observation which consists of obtaining information from a place without necessarily going to the study site. Thus, the snowball method, which consists in having information on a person or infrastructure from a person. This method of indirect observation made it possible to have information on all the departments of our domain of study. This has enabled to asking 202 total informants and companies whose details are highlighted in the tables 1 and 2.

Table 1: Repartition of households investigated per region

| Region       | Number of households investigated |
|--------------|----------------------------------|
| West         | 42                               |
| Northwest    | 27                               |
| Southwest    | 40                               |
| Total        | 109                              |

Source: Field survey 2015-2017

Table 2: Number of questionnaires administered in the study area, Source: Field survey 2015-2017

| Categories             | Number of questionnaires administrated |
|------------------------|----------------------------------------|
| Households users investigated | 109                                    |
| Non-user households investigated | 25                                     |
| MHPP administrators      | 36                                     |
| Photovoltaics panels administrators | 22                                     |
| Micro Windmill administrators | 10                                     |
| Total                   | 202                                    |

The collected data have been analysed using SPSS software and Excel, and the software of cartography Qgis and Adobe Illustrator. Camera and GPS have enabled to obtain qualitative data and the specialisation. This has enabled to get the following results:

3 Results

Three types of electrical RET have been identified in the Uplands of Cameroon: the micro hydroelectric power plants, the photovoltaic panels and the micro windmills. The micro power station hydroelectric is the most promoter until 2013. The diffusion of photovoltaic is the most visible nowadays, favoured by the low of 2013 inviting investment. The micro windmills are the least emergent because we speed of the wind less than 5m/s does not favour the implantation of this structure. A scrutiny analysis of each type is important in the lines that follow.

3.1 Temporal and spatial analysis of micro hydroelectric power plant in the Cameroon western highlands

MHPPs are the technologies, which enable the transformation of the kinetic energy of the watercourse into electrical energy. The small hydroelectricity is the one whose production is less than 10MW according to the International Union of electricity producers, according to the European commission and according to the European Small hydroelectricity Association (ESHA). The small power station hydroelectricity has four categories namely the pico-central inferior to 2MW and the micro power station comprises between 20 kW and 500 kW, the manpower station comprises between 500 kW and 2 MW and the small power station from 2 MW to 10 MW of power (César KAPSEU, 2012). The power station identified in the Uplands of the western Cameroon is situated in the big part in the intervals of first 3 categories and we have chosen to regroup them on the name of micro-central hydroelectric (MCH)

3.1.1 Temporal evolution of micro hydroelectric power (MHPP) in the Cameroon Western Highlands
The first MHPP is implanted for the first time in the highlands in 1929 at Lake and Luermab in the region of the Southwest and in 1944 in Dschang in the region of the West. The second is implanted in 1975 at Menji and in 1988 at Fojumetaw in the Southwest. Then, they will be expanded from 1990s and principally in the 2000s due to the liberalisation of the electricity sector. That is why we can notice the figurant increase from that date (Figure 1).

3.1.2 Spatial dynamic of Micro-hydroelectric power plants in the Cameroon western highlands

The mountain area of the West Cameroon is an area of hydroelectric abundant tank which can be exploited for the production of electricity. We find 48 MCH, 20 in the Southwest, 19 in West (figure 2). There are many in the Southwest because of the irregular relief and the landlocked of some localities that make difficult the use of equipment.

Most of these MHPP are found in rural areas where it is difficult to have access to the National electricity grid. However, it can be noted that the National electricity grid installation in some localities creates two types of dynamics: the dynamic that leads to the competition between the two electricity suppliers and the one that leads to the closing of some MHPP following the predominance of the National electricity grid. In fact, localities where the phenomenon of urbanisation more and more prevails are sometimes victims of choice of use competition between the National electricity grid and the MHPP. Both networks are encountered in some neighbourhoods, most of the population prefers the MHPP energy. These cases are more often than not found in the South West region where the maintenance of equipment (electric poles and wires) is problematic due to their tricky access. In other localities, on the other hand, people prefer the energy supplied by the National Grid because it is constant. These cases are largely encountered in the west region and in a mixed way in the North West region. When the National Grid pressure is very high in localities where the MHPP used to provide energy, that very MHPP is closed. That is why some MHPP near the cities are not active nowadays.

Fig 2. Maps of installed MHPP in the Cameroon Western Highlands in 2017, Source: National Institute of cartography/Google earth, Data: Field survey 2015-2017

Overall, six divisions out of eight in the West region are home to MHPPs. These are notably the Mifi where five MCH sites have been identified, the Hauts-plateau division where two sites have been identified, the Bamboutos, where 03 sites have been spotted, the Haut Nkam where one MHPP has been identified and the noun which has 5 main MHPPs.

Fig 3: Distribution according to division of installed MHPP capacity in the west region in 2016, Source : Field survey 2015-2017

There are nine MHPP with the capacity of 253 kW distributed in four divisions out of seven in the North West region. The Mezam division has the highest capacity gathering four MHPPs meanwhile Donga Mentum, Boyo and Mentchum do not have MHPP. The Bui division has two MCH with a capacity of 78 kW. Momo and Ngo Ketundja divisions have two MHPPs with a capacity of 20 kW each.
The South-West is a region that has the highest number and the highest capacity of the MHPPs. Apart from the Ndam division found on a plain, the five remaining others are home to MHPPs with diverse capacities. Only the Lebialem division hosts the large number of MHPP with a capacity of 2087, meanwhile the Fako division hosts the great MHPP capacity with 15000 kW. The Koupé and Manengouba divisions occupy the third position with a capacity ranging from to 25 kW.

The South-West region is a region that has the highest capacity of installed hydroelectric micro power plant (253 kW), the West region is the second (1901.7 kW) and the last is the North West (253 kW). This energy is used in households, in some NGOs Headquarters for experimentation. It is also used as public lighting in some localities, in health centres and hospitals, in small and medium-size enterprises.

Table 3: Summary of the MHPP capacities in the three regions

| Region      | Capacities (in kW) |
|-------------|--------------------|
| West        | 1901.7             |
| North-West  | 253                |
| South-West  | 2782               |
| Total       | 4936.7             |

Source: Field survey 2015-2017

To better materialise the functioning of these structures, some illustrative pictures of MHPP are presented as follows.

Photovoltaic panels (PP) are a technology, which captures solar energy to transform it into electric or into thermal energy thanks to photovoltaic cells.

3.2 Distribution of photovoltaic panels in the Cameroon Western Highlands

Photovoltaic panels (PP) appropriation in the Western region was feeble in the early 2000s. It was limited to installations of a few Watts in households. But the implementation of the Law relating to the Investment Incentives in Cameroon has led to a quantitative and qualitative growth of this technology since 2013. Various photovoltaic fields have emerged in the region ranging from kits of a few kilowatts to large developments of 80 kW. Their proliferation made them to be numerous RETS in the Western Highlands of Cameroon these recent years. Their rate of development is shown in the following figure:
3.2.2 Spatial evolution of photovoltaic panels in the Cameroon Western Highlands

The photovoltaic plate (PP) is a technology that captures solar energy to transform it into electrical energy or thermal energy using photovoltaic cells. These kits are installed in households, in some NGOs headquarters for experimentation, in the streets as public lighting, in health centres and in schools. PPs distribution is not equitable in the West region. The Noun Division, which is the largest one in the region, has the highest installed power estimated at 364,990 Wc. The Menoua division comes second, followed by the Bamboutos division. The smallest capacity is found in the Hauts Plateaux division, corresponding to 11340 Wc of installed power.

Every division in the South West region has a PP. Kupe Manengouba comes first with an installed capacity of 117,900 Wc. This figure is high thanks to the 80 kWc photovoltaic power plant built to supply the village Nyan. The Lebialem division occupies the second position, followed by the Manyu, Ndian and Meme, on the other hand, have few PV plants. The details are shown in the figure below:

Table 4. Total installed photovoltaic capacity in the Cameroon.

| Region          | Capacity (in WC) |
|-----------------|------------------|
| West            | 603 598          |
| North West      | 138 854          |
| South-West      | 327 910          |
| Total           | 1070362          |

Source: Field survey 2015-2017
To better materialize this space distribution of photovoltaic panels in the Cameroon western highlands, here is a map presented on figure 10 illustrating all these structures.

![Map of photovoltaic panels in the Cameroon western highlands](image)

**Fig 10:** Map localising photovoltaic panels in the Cameroon western highland, Source: Field survey 2015-2017

Some illustrative pictures of the photovoltaic panels are presented in the following pictures.

**Picture 1:** Solar power station of 30 kW at Bakondji (Haut-Nkam division, West Cameroon) for water pomp, Source: Dezeu, 2018

**Picture 2:** Photovoltaic panel supplying a traffic light in Limbe, Source Image by DEZEU, 2018

### 3.3 Microwind turbine distribution in the Cameroon Western highlands

A windmill is a wind turbine generator connected to the vanes and attached to a pylon or a pole whose rotation generates electric energy as wind blows. It is an inexhaustible and free energy that needs simple and proper installations. However, the energy has some problems as opposed to water; the energy intensity of the wind is limited due to the low density of the air. Thus, draughts and water current whose speed is 5 m/s while they are moving together contain a kinetic energy that can produce different powers. The energy produced by water is 78 W/m² while that of wind is 62,500 W/m². Moreover, wind is regular. It blows everywhere and every time it wants to blow (Renewable Energies, 1989). Windmill installation requires a mastery of the wind map (their direction, force) for it has to permanently face winds in order to produce a maximum of energy. Some micro Windmill Production Units which constitute the focus of this study are located in the Cameroon Western highlands. More often than not, they are for household use or for public experimentation use (DEZEU, 2018). Two types of windmill can be observed on the following picture: the first one made locally by a local association (ASSORDER) and the second installed by an Italian NGO; both are supplying households in electric energy.
3.3.1 Temporal development of windmill in the western highlands: feeble appropriation rate

Windmill installation started in the 2000s in the western Cameroon highlands, but this installation was stalled due to the lack of potential. Many researchers and interested persons indulged in search of instruments and knowledge to valorise the technology after the energy sector was freed in 1998. But the lack of wind potential slowed down ITS process of appropriation. That is why many installed windmills are for experimentation. However, some passionate people pay close attention to the multiplication of this technology for personal use, but the outcomes were not encouraging due to the absence of wind in most of the localities. This explains the feeble development as observed in the following figure.

![Figure 11: Evolution of Windmill installation in the western highland, Source: Field survey 2015-2017](image)

3.3.2 Spatial development of windmill in the Cameroon western highlands

Micro windmills are differently shared in the highland regions as MCH and PP. If we consider the West region, the Menoua division has the greatest number of windmills located in Bansoa, in Dschang more precisely in the University and the Nkong-Ni subdivision. The Bamboutos division comes second with 4200 W in terms of installed power. However, three divisions in the region do not have windmill equipment. These are the Haut Nkam, the Koung-Khi and the Ndéré.

![Fig 12. Distribution according to division of installed windmill capacity in W in the West region in 2017, source: Field survey 2015-2017](image)

The Mezam division has the greatest windmill installed capacity in the North West. According to the data issued by the measuring station implemented by the ECOVALEN NGO in the area, an implementation project of a windmill farm of 40 MV is in view. In fact, this site is strategic since it is located at the border of the...
three regions of the Highlands namely the West, North West and South-west the objective is to supply the areas near those three regions when the time comes. There is no wind will infrastructure in two divisions namely the Donga Mantung and Ngo Ketundja.

**Fig 13:** Distribution according to division of windmill installed capacity in the North West in 2017, Source field survey 2015-2017

The South-West is the region where there is less windmill or where the windmill capacity is very weak the Ndian and Manyu divisions do not even have, however, the Fako division has the highest number of windmills.

**Figure 14:** Distribution according division of windmill installed capacity in the South-West, source: 2015-2017 field survey

The west region has the greatest windmill installed capacities (155000 W), then comes the North West (2350 W), lastly, the South-West (1 550W). Their localisation is better presented on the map in the next page. Windmills are largely installed in households, others are rather installed for experimentation in central services of some NGOs and very little is installed to ensure public lighting functioning. Details according to the region are presented in the lines below:

**Table 5: Summary of installed windmill powers in the Western Highlands in 2017**

| Region      | capacity (in W) |
|-------------|-----------------|
| West        | 15500           |
| North West  | 2350            |
| South-West  | 1550            |
| Total       | 19400           |

**Source:** 2015-2017 field survey

The materialisation of the localisation is on the following map.

**Fig 15** Micro windmill maps in the Cameroon western highlands in 2017: localization summary of electric RET installed in the Cameroon western highlands, Source National Institute of Cartography, 2011/Google earth Data: DEZEU TCHINDA Leonnie.

As conclusion, MHPPs are RET whose installation is very high. Pps follows suit and the MW comes last. It can be observed from this table.

### 3.4. Synthesis of spatialization of electric TERs installed in Cameroon HTOs in 2017

By way of summary, the MCH are the TER whose installation capacity is greater. The PP come in second position and the ME in third position. This can be seen in the table

**Table 6 Summary of RET characteristics in the Cameroon western highlands**

| Types of energy       | installed capacity | characteristics                        |
|-----------------------|--------------------|----------------------------------------|
| Windmill              | 24, 850 kW         | Micro windmills are almost stagnant due to the instability of wind |
| photovoltaic panels   | 1070,362 KW        | Pps is more promising in the region since 2013 and they grow fast |
| Micro Hydroelectric power plant | 4936,7 KW | MHPP growth increased since 2000 |
| **Total**             | **6031,912 KW**    |                                        |

**source:** 2015-2017 Field Survey

In short, high capacity power plants namely Luerman, Yoké, Malale and Dschang corresponding to
4210 kW do not exist any longer. In fact, they are colonial power plants that have been closed since 1970 due to the extension of the National electricity grid. Currently, MHPPs are built after the period correspond to 726, 7 kW. This said, the current total electric capacity is 1821.912 kW in the whole Western highlands. However, as the electricity deficit continues to be felt in Cameroon, as the liberalisation of the electricity sector allows smallholders to build MHPPs, these old power plants can be rehabilitated to solve the untimely power shortage in some towns and more precisely in Dschang. The summary of all these RET in the Western Highlands is presented on the map as follows:

![Distribution map of RET in the western highlands](image)

**Fig. 16** Distribution map of RET in the western highlands, Conception and realization: Léonnie DEZEU TCHINDA, 2017

**3.5 Summary of the general characteristics of Electrical Renewable Energy Technologies in the West Cameroon Highlands in 2017**

The general characteristics of renewable energy technologies in the West Cameroon highlands in terms of installed capacity have changed significantly since 2014. Indeed, according to the 2014 statistical yearbook of the Ministry of Water and Energy (MINEE, p.28), the installed capacity of small hydropower generation units is 123 kW in the Northwest, 70 kW in the West and 110 kW in the Southwest. According to our research, the installed capacity is 603.598 kwc in the West, 138.584 kwc in the Northwest, and 327.910 kwc in the Southwest in 2017.

For wind turbines, the installed capacity amounts to 15,500 W in the West, 7800 W in the Northwest and 1550 W in the Southwest in 2017. Compared to the data in the MINEE report (2015), there is an installed capacity of 2.4 kw in the West and 7 kw in the Northwest; data from the Southwest being missing.

For photovoltaic panels, the MINEE report (2015) estimates the installed capacity of solar power generation units in 2014 at 36.26 kwc in the West region, 76.61 kwc in the Northwest region, and 21.02 kwc in the Southwest. According to our research, the installed capacity is 603.598 kwc in the West, 138.584 kwc in the Northwest, and 327.910 kwc in the Southwest in 2017.

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### 4 Discussion

Overall, the growth of renewable energy technology is significant in Western Cameroon Highlands as a whole. Apart from wind turbines, whose growth is almost stagnant, micro-hydro power plants and photovoltaic panels have been expanding in recent decades. This can be observed in their capacities in terms of installed power, which have increased in the Cameroon Western Highlands. In the same vein, Christine Lins and Hannah E. Murdock in 2016 have shown that the capacity and development of RETs have increased in the world in general due to a significant reduction in costs. They also analysed the impact of these technologies on global energy efficiency. Thus, to reinforce this massive use in recent years, it is important to recognise the synergies between renewable and efficiency energy if we are to ensure sustainable energy for all.

Socially speaking, renewable energy projects that are set up without local involvement are in most cases a failure in the Western Highlands. It is the case of the Bapi and Bamougoum MHPPs which were financed by international organisations without the involvement of the local population. They were subsequently closed due to internal management conflicts. The same observation was made in China by Bing Zhu (2011), according to whom the initial investment of rural residents turned out to be the most important factor for them to adopt RETs. Funding, financial support, technical and communication support only come in the second position. This means that local involvement is the first step in setting up RE and sustainable projects.

On the scientific level, it is important for the government to level up research in the field of renewable energy. This will, on the one hand, help ensure a better energy transition and, on the other hand, reduce the effect of the anthropotechnological paradigm as described by WISNER. It will also be a way to adapt these RETs to the local context. This means that in the years to come, it may be possible to transform or even locally manufacture these technologies. This was the
idea of DONER (2007)) after he conducted research to identify the right policy for the development of RETs in the United States. He made three proposals at the end: the expansion of research by the Government through the creation of Research Institutes, the development of these RETs but also their demonstration. 

On the financial level, the valorisation of the Rural Electrification Agency in Cameroon, by making available to it investment funds in rural areas, is very important. DAKPUI (2009) had the same idea when he studied the limits of rural electrification in Togo. He proposed the creation of a rural electrification fund and the promotion of a public-private partnership. The decentralisation of the RE sector is therefore important since it allows the institution in charge to fully manage the funds entrusted to it in this regard. It is in this perspective that WATT (2004) proposed, in the framework of a study on RE policy in the world, the decentralisation of central energy supply systems. This would, according to him, allow them to be popularised and made competitive. The adoption of environmental policies could also reduce market costs.

Moreover, the issue of energy is of concern in this era of sustainable development. More and more, the international community is interested in finding strategies to reduce the consumption of fossil fuels. It is in this perspective that Esoh Elamé and George Elambo Nkeng (2022), in their book entitled la transisition vers les énergies renouvelables au Cameroun, propose some results of applied research on this subject in order to help urban populations especially to become autonomous in terms of electricity.

Furthermore, if Cameroon’s installed hydroelectricity capacity amounts to 1400MW in 2018 as described by KOAGA KIDMO and al.(2021), one could say that the capacity of the Western Highlands amounting to 4036.7 KW (i.e. 4 MW) represents 0.28% in 2018. On the other hand, if we exclude the capacities of the colonial period as produced by MINEE in 2014, we have a capacity of 303 KW for the 3 regions. According to our analysis, we have a capacity of 726.7 KW in 2017, an increase of 423.7 KW in four years.

For photovoltaic panels, the installed capacity represents 133.89 KWc for the 3 highland regions in 2014 according to the 2014 MINEE Report. According to our analysis, this capacity represents 1070.362 KWc (or 1.07 MW) in 2017, an increase of 936.47 KWc in four years. Regarding micro-wind turbines, MINEE 2014 statistics reveal a capacity of 9.4 KW in the North West and South West regions. Our analyses in 2017 reveal a capacity of 24.85 KW (or 0.24 MW), an increase of 15.45 KW in four years.

In conclusion, the increase in installed capacity of each type of energy proves that the populations are appropriating renewable energy technologies in order to improve their daily living conditions. These technologies, which allow for the production of clean energy, also contribute to sustainable development insofar as they reduce the use of oil lamps and generators, which consume fossil fuels. The reduction of the use of the latter leads to the reduction of greenhouse gases affecting the health of the populations and polluting their environment. Renewable energy technologies allow populations to access electricity, which positively affects their lives on the economic, social, environmental and cultural levels. It is in this sense that we can say that they contribute to the sustainable development of the highlands of West Cameroon.

5 Conclusion

This study aimed at analysing spatial renewable energy technologies in the highlands of West Cameroon. The findings revealed that micro-hydro power plants are the most important in terms of installed capacity and are mainly found in the South West region. The results also indicated that photovoltaic panels are the most prodigious insofar as they are multiplying at an exponential rate and are mainly found in the West region. Micro-wind turbines, on the other hand, are in decline in the sense that the wind speed needed in the production of wind energy in this region is low and therefore does not facilitate the rotation of the wind turbine vanes. However, in Mountains and particularly the Bamboutos, the wind speed is sufficient and could allow the construction of a large wind power plant for the production of energy. Brief, all of them have increased in capacity. they start to be diffused.

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