Potential and demand for photovoltaic systems in rural and urban areas in 3 selected African countries

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1. Summary

Pollution, the growing global population and the increasing energy demand requires the use of renewable energies, especially in the very sunny regions of the tropics and subtropics. The potential and conditions for the use of renewable energies, especially photovoltaics, in the three selected African countries of Tanzania, Nigeria, and Madagascar are compared. Decentralized supply structures must be established to supply rural regions and above all, the poor people with energy. In particular, the strong population growth requires a parallel expansion of the energy supply, ideally with renewable energies. Photovoltaic power supplies have already been implemented, both small-scale systems and mini-grid systems. Some solar power plants already exist, and some are planned. Based on the very different structures in the countries, a comparison is made to determine what a future energy supply with photovoltaics could look like by 2035.
The data, facts, and results presented here were obtained through research, analysis, and own investigations. These were identified during various short and long visits, gaining insight into the technical structures, and discussions with competent experts in the three countries. Madagascar (3 visits), Nigeria (10 visits), Tanzania (2 visits).

Keywords: Tanzania, Madagascar, Nigeria, Solar Home Systems (SHS), Microcredits, Pay as You Go (PAYG), Education, Africa

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2. Introduction

The reliability of the power grid is a major problem due to frequent grid overloads. However, the very high solar radiation in these three countries offers numerous opportunities for the use of renewable energies, or rather, for generating electricity from photovoltaic systems. Due to the very different energy needs in these countries, depending on the situation in large cities, small towns, and rural areas, very different decentralized solutions are required. The infrastructure for a reliable energy supply is still inadequate in the various sectors: agriculture, transport, industry, and private buildings/huts. The purchasing power and disposable income of many people in all three countries, especially among rural residents, is below US$2 per day. Energy demand is also rising sharply with population growth, leading to a critical shortage in the coming years. Direct solar radiation is quite high in the individual regions of the three countries, making the use of photovoltaic systems definitely profitable.
The expansion of electricity generation with photovoltaics is based on two criteria.
The first criterion: the electricity supply in all three countries is characterized by supply problems, power cuts lasting several hours, or only sectoral supply in major cities. For example, in capitals and large cities such as Dar es Salaam (Tanzania), Antananarivo (Madagascar), or Abuja and Lagos (Nigeria), electricity is only available for 4-5 hours in certain city-sectors. This leads to many small standby diesel generators operating for many hours a day in the cities (Ref. 20).
The second criterion:
The vast majority of villages have no connection to the public power grid at all (Ref. 19). Therefore, there are two possibilities: either no electricity or the more expensive solar power. Decentralized photovoltaic systems therefore offer a good alternative, as the overall energy supply situation in all three countries is very precarious. In Madagascar, only about 23% of people have an electricity connection, while in rural villages, the figure is only about 17%. (Ref.15) In Nigeria, approximately 67% of the population has access to electricity, while in rural areas, the figure is approximately 36% (Ref.4). In Tanzania, 43% have access to electricity, compared to 77% in urban areas and only 23% in rural areas (Ref.6).

3. State of the Art

Successful solar energy projects already exist. The potential of photovoltaics is well known, but the bottlenecks are financing and the inadequate power grid. Nevertheless, some developments are already underway. In addition to hydropower and wind energy, photovoltaic projects have already been implemented in Tanzania, Nigeria, and Madagascar. The types of projects range from small solar home systems to micro-grid systems and to larger power plants.

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3.1 Micro-Systems

Small systems with a few watts of power are already being used in villages.

Solar home systems (SHS) with several hundred watts up to the some kW range are being used. In particular, many mini-grid systems are already in operation as hybrid systems in all three countries. This means that systems in the 50 to 100 kW range supply electricity from diesel generators, photovoltaic modules, and batteries (Ref. 19, Ref. 28).

3.2 Larger Solar Parks

Solar parks that are integrated into the power grid – some with several hundred MW of capacity – have already been installed in all three countries, and more are planned. These systems are primarily to support the public power grid, but can also provide individual regions with self-sufficient power.

3.3 Training

There are still major deficits in the training sector. Theoretical training in the field of renewable energies/photovoltaics is already well advanced at universities. However, craftsmen and skilled workers are often only semi-skilled. Few training programs in the field of photovoltaics are widespread. Individual approaches exist in Nigeria and Tanzania (Ref. 14). Therefore, there is a great need for education. Dual Vocational Training (DVT) programs can be used to introduce trainees to the topics of renewable energies, photovoltaics, and climate protection. Initial approaches are already in place. Public educational institutions are particularly challenged in this area.

4. Status Quo

4.1 Cities

Cities, especially large cities, are very busy with traffic. There is a lot of traffic congestion, almost exclusively caused by vehicles with combustion engines. Electric vehicles are rare, and the charging infrastructure is inadequate. The public power grid is often overloaded. Due to frequent power outages, diesel generators are often used in addition (Ref. 19). Most companies, hotels, public institutions, and even private individuals have their own power supply, usually with diesel generators, and some already with photovoltaics.

4.2 Rural regions

Outside of cities, in rural areas, and especially in villages, the main form of energy is firewood and charcoal, which is used primarily for cooking (Ref. 8). Solar cookers have not yet become widespread for various reasons. Kerosene lamps are used for lighting, although small and very small PV systems (village kits) are already in use.

4.3 Solar radiation and the Energy situation

The increase in energy consumption could be managed through the use of renewable energies. The very high solar irradiation in all three countries provides ideal conditions for the use of renewable energies (see Table 1). Very good conditions exist in the north of Nigeria (Kano, Sokoto, Maiduguri), in Tanzania in the west and northwest (Dodoma, Mbeya, Iringa, Tabora), and in Madagascar in the east and south (Toliara, Mahajanga) (Ref. 29).

Table 1: Hours of sunshine per year (Ref.19)

Country	Tanzania	Nigeria	Madagascar	Germany	Brasil
Hours of sunshine per year (2024)	2592 h to 3249 h / a	1643 h to 2993 h/a	2482 h to 3103 h /a	1606 h to 1825 h/a	1789 h to 3103 h/a

The average electricity consumption is summarized in Table 3. In Madagascar, electricity consumption is comparatively low, resulting from the high proportion of rural population and the lack of infrastructure.

Table 2: Electricity consumption per year per person, (Ref.15)

Country	Tanzania	Nigeria	Madagascar	Germany	Brasil
Electricity consumption kWh /a /Person (2024)	119	138,5	72	6091	2762

The shares of the different types of electricity generation systems vary considerably in the three countries (see Table 3). In Tanzania, electricity is generated primarily by gas-fired power plants. Approximately more than a third comes from hydropower plants. A small portion comes from diesel-fired power plants. Less than 1% each comes from biomass, solar, and heavy fuel oil generation plants (Ref. 6). In Nigeria, the majority of electricity comes from gas-fired power plants, with some from diesel or gasoline generators and hydropower. Only less than 1% (approx. 38 MW) comes from photovoltaic power (Ref. 2). In Madagascar, the majority of electricity demand is met by hydropower plants. More than 100 diesel-fired power plants generate more or less the rest of the production. Less than 1% each comes from photovoltaics and wind energy (Ref. 15).

Table 3: Sectors of electricity supply (%)

Land	Gas	Diesel	Hydro-power	Photo-voltaics	Wind	Biomass	Heavy oil
Tanzania (Ref.6)	59,3	3,9	35,7	<1	--	1	<1
Nigeria (Ref.2)	70	14	15	<1	<1	--	--
Madagascar (Ref.15)	--	36	60	3-4	<1	--	--

4.4 On-grid systems

Investments are already underway. Several large ground-mounted photovoltaic systems (even far outside the urban centers) exist and are planned. For example, in Tanzania (10 MW, 60 MW, 150 MW, proposed), in Nigeria (4.5 MW, 30 MW, 100 MW existing, 5600 MW proposed), and in Madagascar (17 MW, several 20 MW existing, some planned) (Ref. 16).

In cities, many high-rise buildings offer available roof space for photovoltaic systems. The direct consumption of electricity in individual buildings relieves the strain on the power grids. Diesel generators can initially be switched on during peak demand.

4.5 Green hydrogen

Although the generation of hydrogen by photovoltaic is still relatively expensive, there are already individual projects in Nigeria. Hydrogen generated by photovoltaics is used as an electricity storage medium. These projects are still in their early stages, but hydrogen is expected to become an alternative to diesel in the future (Ref. 1). In Nigeria, capital strength is comparatively higher than in the other two countries. Therefore, hydrogen will play a role here earlier.

4.6 Economic situation

Madagascar's gross domestic product (GDP) is the lowest of the three in comparison. Nigeria's GDP is also still relatively low compared to Europe, but increasing. Purchasing power and investment capacity are still low in the private sector, especially among the poor. With a quite high population growth rate of over 2% in all three countries (table 4, Figure 1), the energy consumption will also increase sharply in the coming years.

Table 4: Demographic development and GDP (Ref.13)

Country	GDP (US$) Gross domestic product	Population 2024 (Mio)	Growth of population per year	Population 2035 (Mio)	Population 2050 (Mio)
Tanzania	3 900	68,6	2,7 %	92,1	129,6
Nigeria	6 200	227,8	2,1 %	281,6	351,6
Madagascar	1 840	30,8	2,4 %	41,8	59,5

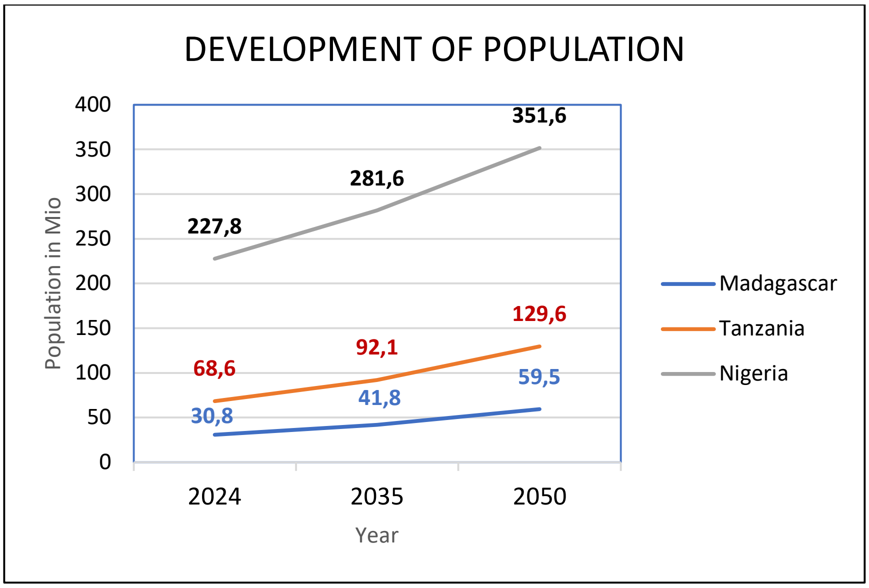

Figure 1: Population development until 2050 (Ref. 14)

5. Solutions

The three countries have great potential for the use of solar power from photovoltaic systems. However, the very different energy demands – depending on the situation – must be taken into account. Very different decentralized solutions are required depending on whether the city is large, small, or rural.

5.1 Country-specific differences

For all three countries, it is true that, for the foreseeable future, larger cities and metropolises can only be supplied with solar power as a supporting capacity by feeding into the grid. Full supply with electricity from renewable energies is only possible in combination with wind turbines and electricity storage systems.
E-mobility will also not play a major role in any of the three countries over the next 10 years, as the infrastructure for a charging network is completely lacking. This is especially true in large cities such as Lagos, Abuja, Dar es Salaam, Dodoma, and Antananarivo. Decentralized solutions are generally best suited.
Tanzania has a low population density, but isolated grids are already widespread throughout the country.
Although Nigeria's power grid is also subject to frequent power outages, there are approximately 20 mini-grid companies that act as developers and operators in the country (Ref. 21).
Diesel generators combined with lead-acid or lithium-ion batteries are generally used to generate electricity. Hybrid mini-grids, a combination of diesel generators, photovoltaic systems, and batteries, have been in operation in the country for some time (Ref. 31).
Madagascar does not have a coherent power grid and has also a low population density. Nigeria and Tanzania have a national power grid, but outside of urban centers, the power grid is poorly developed. In rural, sparsely populated regions, especially in Madagascar, there is great potential for solar power or small-scale photovoltaic systems (Ref. 17). Both, power grids are missing, but mini-grid systems are also not yet widespread.
The increasing population growth of more than 2% per year in all three countries (see Table 4) shows that energy demand is also rising sharply, even if prosperity is growing only slowly.
The relatively low average electricity consumption (see Table 2) favors the expansion of photovoltaics. This particularly affects the rural population, as there is no electricity grid there, making small photovoltaic systems economically sensible. Microfinance institutions or PAYG (pay as you go) microcredit systems are also being used for this purpose. Solar Home Systems (SHS) or other mini-photovoltaic systems are being financed with loan terms of 6 to 36 months (Ref. 10, Ref. 18).
This will enable an increase in access to electricity in villages in Madagascar, Tanzania, and Nigeria in the coming years. Low-income people will thus be able to afford a basic electricity supply.

5.2 Forecast of electricity consumption

Just as the population will increase in the coming years (see Fig. 1), per capita energy consumption will also increase. However, this will not happen linearly, but rather exponentially, due to increasing prosperity and technological advancements.
Assuming, that per capita energy consumption will increase by 10% from 2024 to 2035 and by 30% from 2035 to 2050, the demand will increase significantly. This results in the following table (own calculation, Table 5):

Table 5: Forecast, electricity consumption per year, per person from 2024 to 2050 (own calculation)

Country	Tanzania	Nigeria	Madagascar
Electricity consumption kWh /a /Person (2024)	119	138,5	72
Electricity consumption kWh /a /Person (2035)	130,9	152,35	79,2
Electricity consumption kWh /a /Person (2050)	170,17	198,05	102,96

The calculation (Table 5) was carried out as follows: for 2035, in addition to the increased population, an increase in energy consumption of 10% compared to 2024 was expected. For 2050, in addition to the increase in population, an increase in energy consumption of 30% relative to 2030 was expected.

Table 6: Forecast annual electricity consumption for the entire population (own calculation)

Country	Tanzania	Nigeria	Madagascar
Electricity consumption kWh /a /Person (2024) For the entire population per year	119 x 68,6 Mio E = 8163,4 Mio kWh = 8,16 TWh	138,5 x 227,8 Mio E =31550,3 Mio kWh = 31,55 TWh	72 x 30,8 Mio E =2217,6 Mio kWh = 2,22 TWh
Electricity consumption kWh /a /Person (2035) For the entire population per year	130,9 x 92,1 Mio E =12055,89 Mio kWh = 12,05 TWh	152,35 x 281,6 Mio E =42901,76 Mio kWh = 42,90 TWh	79,2 x 41,8 Mio E = 3310,56 Mio kWh = 3,31 TWh
Electricity consumption kWh /a /Person (2050) For the entire population per year	170,17 x 129,6 Mio E =22054,03 Mio kWh = 22,05 TWh	198,05 x 351,6 Mio E =69634,38 Mio kWh = 69,63 TWh	102,96 x 59,5 Mio E = 6126,12 Mio kWh = 6,12 TWh

This means that current energy supply capacities must be drastically increased to meet the demand (Table 6). However, in order to avoid significantly increasing CO_2 -emissions, the use of renewable energies, especially photovoltaics, is a efficient option.
Since energy prices vary in the three countries, an average is used for each calculation. In Tanzania, for example, the end-user price is € 0.04/kWh for up to 75 kWh of electricity consumption per month. From 76 kWh per month, the price is € 0.13/kWh (Ref. 5, Ref. 24).
In Nigeria, electricity is available in different price bands: 225 Neira per kWh for 20 hours of electricity per day. For 16 hours of electricity per day, a kWh costs 65 Naira. For 12 hours of electricity per day, a kWh costs only 50 Naira (Ref. 25).
In Madagascar, the price bands apply to residential and business users. The cost per kWh of electricity for residential use is US$ 0.13, while for business use it is US$ 0.165 (Ref. 26).
To facilitate comparison, the following energy prices (see Table 6) from (Ref. 27) were used in US$/kWh:

Table 7: Energy prices in US$ per kWh, June 2025 (Ref.27)

Country	Tanzania	Nigeria	Madagascar
Energy price per kWh (2025)	0, 094 US$	0,033 US$	0,125 US$

5.3 Investments

Considering the total population's annual energy consumption from Table 6 in conjunction with current energy prices (2024) from Table 7, the following theoretically available capital volume (without price increases) per year results in Table 8:

Table 8: Theoretically available capital volume per year

Country	Tanzania	Nigeria	Madagascar
Capital volume available per year (based on 2024)	0, 094 US$ x 8 163,4 Mio kWh = 767,35 Mio US$	0,033 US$ x 31 550,3 Mio kWh = 1 041,16 Mio US$	0,125 US$ x 2 217,6 Mio kWh = 27,72 Mio US$

Assuming that 15% of this would be invested in photovoltaics, capital could be freed up to build photovoltaic power plants. The world market price (system price) averages US$ 691 per kW of installed capacity (Ref. 12). For large PV systems, this value is € 617 (Ref. 11). Since both small and large systems are planned in the future, an average value is used. With an exchange rate (September 18, 2025) of € 0.85 to US$ 1, €617 = US$ 524.4. The average of 524.4 and 691 results in an average calculated value of US$ 607.7 per kW of installed capacity. At this world market price of US$ 607.7 per installed kW, photovoltaic systems in the MW range could be installed.
Based on the theoretical capital volume from (Table 8), the calculation results in:
15% of the capital volume x price per kWh / US$ 607.7 (world market price/kW)
gives an available investment volume, measured in MW, to realize the PV potential per year (based on 2024):

-Tanzania: 189.4 MW (5.56% of total installed capacity)
-Nigeria: 256 MW (1.96% of total installed capacity)
-Madagascar: 6.84 MW (0.9% of total installed capacity)

Further potentials from 2035 to 2050 will be calculated later in Part 2, the continuation of the study in 2026. The total installed capacity (at the end of 2024) and the forecast for 2035 are listed in Table 9.

Tab. 9: Installed power capacity, 2024 and Forecast 2035

Tanzania	Nigeria	Madagascar
3404 MW (2024), (Ref.23)	13 000 MW (2024), (Ref.9)	760 MW (2024), (Ref.3)
4 909 MW (2035)	16 198 MW (2035)	1 107 MW (2035)

5.4 Expansion of photovoltaic potential

Assuming that hydropower will not be expanded in the foreseeable future, the remaining MW of capacity could be covered by wind energy and photovoltaics, each 50%. Assuming increasing energy consumption in general (Table 5) and an increase due to the continuous population growth (Figure 1), the following expansion potential results (Forecast 2035, Table 9):

In Tanzania, 3,404 MW are installed, 35.7% of that is hydropower (1,215.2 MW). Taking into account a 10% increase in consumption (Table 5) and a 34.2% increase in population by 2035 (Table 4), demand increases from 3,404 MW to 4,909 MW. Subtracting hydropower of 1,215.2 MW, this leaves a demand of 3,693 MW, which could be covered 50% each by wind power and photovoltaics. This means that with 1,846.5 MW of PV expansion and 190 MW per year (5.56%), 100% renewable energy supply would be achieved after 10 years in 2035.

Nigeria has 13,000 MW installed, 15% of that is hydropower (1,950 MW). Taking into account a 10% increase in consumption (Table 5) and a 23.6% increase in population by 2035 (Table 4), demand increases from 13,000 MW to 16,198 MW. Subtracting hydropower of 1,950 MW leaves a demand of 14,248 MW, which could be covered 50% each by wind power and photovoltaics. This means that with a PV expansion of 7,124 MW and an annual capacity of 256 MW (1.96%), 100% renewable energy supply would be achieved after 27.8 years in 2053.

In Madagascar, 760 MW are installed, 60% of that is hydropower (456 MW).

Taking into account a 10% increase in consumption (Table 5) and a 35.7% increase in population by 2035 (Table 4), demand increases from 760 MW to 1,107 MW. Subtracting hydropower of 456 MW leaves a demand of 651 MW, which could be covered 50% each by wind power and photovoltaics. This means that with 325.5 MW of PV expansion, at 15 MW per year (2.2%), 100% renewable energy supply would be achieved after 22 years in 2047 (see Table 10).

Table 10: Target years of 100% renewable energy supply (own calculation) and current status (2024)

100% renewable energy supply (target year)	Tanzania	Nigeria	Madagascar
Villages	2030	2030	2035
Entire Country	2035	2053	2047
Statuts 2024 (s. Table 3): Wind, Photovoltaics, Hydropower	36%	16%	64%

5.5 Mini-grid systems in rural areas

Mini-grid systems and small-scale systems financed through microcredit systems are already widespread in rural areas in all three countries. These are usually equipped with diesel generators and batteries. However, these systems are increasingly being hybridized, meaning that with the support of photovoltaic systems, the generated electricity gradually becomes more CO_2-neutral.

An example from Madagascar shows that consumers are willing to pay higher prices. This is realized by a project in the town of Mahasolo in Madagascar. This town is located remotely, about 5 hours from the capital, and is 100% powered by a 150 kW photovoltaic power plant.

With a national energy price equivalent to 12.5 cents (US$), (Ref.26), consumers there pay 35 cents (US$) per kWh for solar power. Since there is no connection to the grid, the only alternative is solar power from PV. Of the 12,000 residents, 2,500 have an electricity connection to the PV system. Here, the photovoltaic power supply contributes to the promotion of small businesses in a small town. Even a rice mill with 22 kW output can be operated with solar power.

For larger cities and metropolitan areas, however, very large open-space photovoltaic systems that support the grid are more suitable (Ref. 16).

Many companies, especially in Nigeria, offer financing options in addition to the technology. In Madagascar, too, mini-hybrid systems in the range of 40 to 60 kW are being installed in villages. These systems are particularly suitable for agricultural applications such as rice or grain mills, as well as for water pumps, even in sizes smaller than 1 kW.
However, the financial situation of the citizens is a problem. Microcredits therefore offer one option.
Microcredits, also known as "pay-as-you-go" (PAYG), are already widespread in Tanzania in particular (Ref.18). With this payment system, private customers use mobile money to make daily or monthly payments for their small-scale solar system over a period of 6 to 36 months.
These payments are often lower than household expenditures on kerosene, candles, or batteries. Common system sizes are: 8 W, 15 W, or 50 W (Ref. 10).
Due to income differences (see GDP, Table 3), the development is proceeding at different speeds. A 100% supply of villages with at least small photovoltaic systems could be achieved in Nigeria and Tanzania by 2030. In Madagascar, however, this will be achieved later approximately by 2035.

5.6 Different sectors

The potential for photovoltaic power generation exists in many sectors: agriculture, mining, tourism, and for cities and villages.
Sectors in which photovoltaics are particularly well-suited are listed in Table 11

Table 11: Sectors for potential photovoltaic power generation

Country	Agriculture	Mining	Tourism	On grid-examples real and planned Cities (MW)	Private, towns, villages
Tanzania	Solar water pumps, processing units for cotton, coffee, tea, cashew nuts, tobacco, sugar	mining for graphite, coal, gold, nickel, iron ore, diamond	mini grid, domestic systems and solar water pumps for hotels	Dodoma, 55 Kahama, 10 Shinyanga, 60	Mini grid solar home systems village kits
Nigeria	Solar water pumps, small factories for processing of cocoa, peanuts	not evaluated, but for oil-/gas industry	not evaluated	Abuja, 100 Bauchi, 100 Benin City, 15 Ilorin, 500 Maiduguri, 200	Mini grid solar home systems village kits
Madagascar	Solar water pumps, processing units for vanilla, cotton, coffee, pepper, cocoa, peanuts	mining for gemstone, chrome, gold, graphite, iron ore, phosphate	mini grid, domestic systems and solar water pumps for hotels	Antananarivo,25 Toamasina, 20 Tulear, 2,9 ; 10	Mini grid solar home systems village kits

5.7 SWOT analysis

The following SWOT-analysis (Strengths, Weaknesses, Opportunities, Threats) compares the situation of the three countries once again (Table SWOT). High solar radiation and frequent power cuts strongly favor the expansion of photovoltaics.

Table 12 SWOT analysis

Strength	Weakness
TANZANIA High solar irradiation Support from government-run renewable energy projects (REA) Currently low inflation No customs duties on renewable energies	TANSANIA Banks are reluctant to lend Bureaucracy in permitting Little practical training, mainly theoretical at the university
NIGERIA High solar irradiation Government financing feasible Support from government-run renewable energy projects (REAN)	NIGERIA Many large, very large cities; photovoltaics are currently only used to stabilize the grid Strong competition with diesel generators (oil producer) Little practical training, mainly at the university
MADAGASCAR High solar irradiation Support from international NGOs Currently low inflation No customs duties on renewable energies	MADAGASCAR Low purchasing power, rural population is very poor Little industry that requires electricity Little practical training, mainly theoretical at the university Banks are reluctant to lend
Opportunities	**Threats**
TANSANIA Rural structure, potential for small-scale systems in villages Power cuts: Photovoltaics offer a reliable alternative solution Many providers of solar home systems Microfinance banks offer microloans	TANSANIA Poor transport routes Quality of Chinese products, product guarantee
NIGERIA Purchasing power for small and medium-sized systems available Power cuts: Photovoltaics offer a reliable alternative solution Increasing processing of agricultural products requires decentralized energy supply	NIGERIA Strong exchange rate fluctuations Competition with the oil/gas industry Poor transport routes Political unrest in northeast Nigeria Quality of Chinese products, product guarantee
MADAGASCAR Rural structure, potential for small systems in villages Poor infrastructure favors small PV systems Tourism: Small hotels have a need for small PV systems Power cuts: Photovoltaics offer a reliable alternative solution Microfinance banks offer microloans	MADAGASCAR In the South: Destruction by natural forces/cyclones Poor transport routes Previously few qualified specialists Quality of Chinese products, product guarantee

6 Outlook - Scenario 2030

With the rapid expansion of solar power generation to 15 MW, 190 MW, and 256 MW annually, Madagascar, Tanzania, and Nigeria could speed up to achieve an energy supply primarily powered by renewable energy.

Rural electrification in villages in all three countries could be achieved by 2030 and 2035, respectively, through PAYG financing. A minimum energy supply there of 100% with photovoltaics is feasible using small and mini systems (village kits).

In cities, the share of renewable energy supply or photovoltaics could be gradually increased through open-space PV systems outside of the cities. In combination with wind turbines and the use of battery storage, security of supply could be drastically increased.

The African Development Bank (ADB) is planning, together with the World Bank, the project "Mission 300" to provide energy access to 300 million Africans by 2030. Since 2016, the ADB has shifted or redirected approximately 87% of its investments toward renewable energy.

There are suggestions that the entire continent's pension funds, totaling US$ 100 Trillion, could be used to invest in energy infrastructure in Africa (Ref. 7).

Electrification of rural areas has several positive effects. The quality of life of villagers is significantly improved, even for small-scale consumption. An electricity supply promotes local small businesses and promotes economic growth.
The ability to further process agricultural products and then sell them for a higher price than the unprocessed products increases the local income through higher added value (Ref. 22). A clean energy supply with photovoltaics saves fuel costs and helps reduce CO2 emissions.

7 References

Own research by several visits and interviews in the countries: Madagascar (3 visits), Nigeria (10 visits), Tanzania (2 visits).

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