Morocco’s “No-Waste” Strategy: potentials for green entrepreneurs

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Author

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Executive Summary

Morocco’s potential for climate entrepreneurship is high, and the country’s dynamic high-growth entrepreneurs are helping lead the country towards its green growth goals. According to the World Bank survey, Morocco represents a breeding ground for green entrepreneurship with a growing number of green start-ups. By scaling innovative business solutions to local climate challenges, green entrepreneurship will not only benefit Moroccans, but neighboring South Mediterranean and African countries as well.

The Moroccan government started to roll out several sustainability initiatives such as the National Roadmap for Energy Valorization of Biomass by 2030, National Energy Efficiency Strategy for 2030, Green hydrogen roadmap, Low Emission Development Strategy for 2050 (LEDS) and others. A new development model is also in process.

However, many challenges that relate to sustainable development still remain. One of them is waste management which represents in Morocco (as other developing countries) an important climate, social and economic challenge with almost 7 million tons of solid waste generated every year with an increase of 3% every year.

This brief aims to address Morocco’s green entrepreneurship ecosystem focusing on solid waste solutions, highlighting the opportunities and challenges of the waste management model and government efforts that are in place. Then it will analyze the potentials of green entrepreneurship in Morocco through the success stories of two start-ups that established...
their projects in waste management through finding green solutions to challenges in their communities. Through a survey conducted with these ‘green entrepreneurs’, they expressed the challenges they faced and how they have overcome these challenges.

Some of the main recommendations include creating strong policies and support to the green entrepreneurship ecosystem by deploying training programs dedicated to green professions and promoting research, development and innovation initiatives through appropriate incentive measures, carried by academic, industrial and financial players. As a result, this support would enhance the environment for green entrepreneurs and unlock the full potential of Morocco’s green private sector development agenda.

1. Introduction

Morocco is a committed player in sustainable development in Africa and in the world. The Kingdom pledges to preserve a balance between the environmental, economic and social dimensions, by improving the living environment of citizens, strengthening the sustainable management of natural resources, and the promotion of environmentally friendly economic activities.

Morocco ranks first in the Middle East and North Africa region, in the 2021 edition of the Green Future Index, developed by a team of MIT researchers, to measure the progress and commitment of 76 countries promoting a low carbon economy. The country’s new development model, released in May 2021, will present the pathway forward and includes a set of guiding frameworks addressing economic, social and environmental growth. The environmental priority areas include plans to strengthen the resilience of territories to climate change (Strategic choice 4) and a better harness the full potential of green and blue economies2.

However, the country is facing various climate change challenges, among which is solid waste management, which has witnessed significant growth in the past few decades. According to a recent report by the World Bank, the MENA region produces the least waste in absolute terms (amounting to 129 million tons in 2017 compared to Europe and Central Asia for instance which amounts to 392 tons per year)3. Morocco produces almost 7 million tons of solid waste every year with an increase of 3% every year. To face this increasing trend, a strategy dedicated to enhancing the green economy through ‘no-waste’ tools could be the best part of the solution by gratifying the logic of a circular economy and integrating local specificities and potentialities.

At the same time, the country’s strategy to find sustainable solutions to manage waste, represents an opportunity to green entrepreneurs. In recent years, investment in the various facets of Morocco’s entrepreneurship ecosystem, including green entrepreneurship, has become the focus of both the public and private sectors. Green entrepreneurship refers to the activity of consciously addressing environmental and social problems and needs, and coming up with innovative entrepreneurial ideas that will bring solutions to these challenges.

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Accordingly, the Kingdom has potentials to play a leading role in green entrepreneurship in the region. In fact, many young Moroccan entrepreneurs have already started their businesses in this field with an international mindset, and are working in various countries across the world. The country is now exporting its skills to Africa where it is becoming a major foreign investor, in different sectors including now green entrepreneurship.

2. Solid Waste Management: A Challenge for Morocco’s Climate Change Goals

Morocco’s commitment toward the 2030 Agenda and the Paris agreement is burdened by the solid waste management challenge. Changing lifestyles, production and consumption and the proliferation of outlying districts have led to significant growth in the volume of solid waste. The overall production of solid waste in recent years is around 6.9 million tonnes/ year. The amount of urban waste produced is 5.3 million tonnes/ year, or the equivalent of 0.76 kg per day per inhabitant. In parallel rural waste is of the order of 1.6 million tonnes/ year, which is equivalent to 0.3 kg per day per capita.

The increase in the quantities of waste poses a series of problems at the levels of collection, disposal and landfill, especially in small municipalities and urban agglomerations, which leads to the saturation of landfills with tremendous consequences on the ecosystems. Landfills are sources of methane, a powerful greenhouse gas, and other toxic fumes. In addition, wastes are a source of contamination of soils and fresh and coastal waters. The coast becomes the ultimate repository for many solid waste and liquid pollution from inland.

In addition, the informal nature of services, especially in collection, remains an issue. Informal waste pickers collect around 3-5% of waste, with studies indicating that 7000 people work in this informal industry. Some private companies, have tackled this challenge by incorporating 150 and 170 informal waste pickers, respectively, into the workforce of their landfills and sorting units through cooperative agreements.

The Kingdom is taking steps to improve the collection, processing and valorisation of waste. During the COP22 UN Conference on Climate Change, which took place in Marrakech in November 2016, the government signed funding agreements with the Dutch Development Bank (FMO) and the European Investment Bank (EIB) to enhance solid waste management. In addition, the FMO and the EIB signed an agreement creating a facility for the Bank of Africa to fund initiatives that enhance solid waste-management practices and standards.

However, the waste management model in Morocco has seen a phased evolution with the national integrated strategy since 2008. Technical, financial, legislative and regulatory efforts are addressed by public authorities and territorial actors towards an inclusive approach with the contribution of the main stakeholders such us the private actors, associations and academics.

By the same token, Morocco adopted the best practices of European countries’ waste management approach by prioritizing the following options:

- Reducing waste at source
- Reusing and recycling (paper, glass, plastics, aluminum, etc.)
- Composting the biodegradable fraction
- Landfilling or combustion by adopting standards of gas emissions with biogas valorisation.

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5 Progress in establishing an ambitious domestic waste management scheme in Morocco - a model for developing countries March 2017
6 Oxford Business group: Modernisation of Morocco’s waste-management infrastructure receives international support
Solutions integrating the three components (technical, regulatory and educational) would allow a get out of the “All landfill” model and embrace the circular economy. The economy that aims to change the paradigm in relation to the unsustainable linear model considers waste as resources, and not garbage, favouring a management method based on the prevention, reduction, sorting, material recovery and energy recovery of waste, respecting the health of citizens and ecosystems, preserving resources and creating more green jobs.

Morocco is continuing its overall commitment to an inclusive green economy transition as outlined in its 2017 National Sustainable Development Plan (SNDD) aiming to reconcile economic growth, social inclusion, environment protection and enhancement by 2030⁷.

3. Unlocking the Potentials of Green Entrepreneurships in Morocco

The transition to a green economy is promoted thanks to the growing awareness of environmental issues and the sustainable development policy in Morocco, which is encouraging particularly the use of renewable energies, sustainable agriculture, sustainable water management, waste recovery and eco-construction. Currently, green entrepreneurship constitutes an opportunity for national companies to become more innovative and competitive, contributing to a new economic dynamic in full evolution.

At a regional level, Green Entrepreneurs in the Mediterranean are active in a range of economic sectors (Fig1), they represent an important opportunity to bring sustainable innovations to the heart of the economy. From this perspective, Green Startups deserve not only support in the form of public policies but also the right mix of financing mechanisms to realize their potential⁸.

Figure 1: Green entrepreneurs’ activity in the economic sectors 2017, Union for the Mediterranean

Source: Enabling access to finance for green entrepreneurs in southern Mediterranean countries, 2018. Union for the Mediterranean

In addition, funding seems to be the main issue facing Green Entrepreneurs in the Mediterranean, as expressed by two thirds of respondents to a survey published via the

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³ This national strategy was initiated by the Kingdom during the 2009 and 2010 as a national charter and an integrated action plan formalized in a Law Framework. It is the logical and strategic framework that allows for consistency and synergy between programs, plans and sectoral policies in a perspective of sustainability and in the spirit of inclusivity. It must thus design a social project that respects the value of the territories, its natural and cultural heritage, the aspirations of its youth and the rights of future generations.

⁸ UfM : Enabling access to finance for green entrepreneurs in southern Mediterranean countries.
Switchers web portal in 2017. The level of financial literacy of Green Entrepreneurs can be an important barrier to access financial services (Fig 2). Green Entrepreneurs who are not familiar or comfortable with financial products, will simply not ask for them.

**Figure 2: Green entrepreneurs’ main challenges with funding 2017. Union for the Mediterranean**

![Chart showing main challenges with funding for green entrepreneurs in 2017.]

Source: Enabling access to finance for green entrepreneurs in southern Mediterranean countries, 2018 Union for the Mediterranean

Matching financing needs with the available financing instruments may be a challenge in Mediterranean countries. The risk and return expectations of investors and investees do not often align. Moreover, there is a lack of patient capital or flexible finance that fits the needs of green entrepreneurs or that the conditions are too restrictive 9.

At the same time, Morocco has a young and highly educated workforce, and plentiful natural assets. However, unemployment rates increase with the level of formal education, driven by the fact that many young graduates often queue for desired jobs with a preference for the public sector. Furthermore, led to an increase in unemployment rates which was exacerbated due to Covid 19 pandemic during the last 2 years jumping to 33,4% amid 2020 to stay around an average of 31% in 2021. (Fig 3)

**Figure 3: Morocco Youth unemployment rate, 2021.**

![Graph showing Morocco youth unemployment rate from 2018 to 2021.]


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9 UfM : Enabling access to finance for green entrepreneurs in southern Mediterranean countries.
Despite remarkable improvement in education\textsuperscript{10}, there are not enough jobs fitting the profile and meeting the expectations of university graduates, many young people with a higher education remain unemployed\textsuperscript{11}.

To meet this challenge, green entrepreneurship is a catalyst for employability and socio-economic development in Morocco, attracting more and younger people concerned about the environmental footprint through a variety of financial and technical support mechanisms for the benefit of this category. The fields of waste recovery and wastewater treatment are the most heavily invested by Moroccan start-ups, with an average between 30 and 50\% of project leaders that are supported by the solar cluster\textsuperscript{12}.

Over the years and thanks to growing environmental awareness, a number of programs have been put in place to offer such opportunities such as the Green Business Incubator (GBI) initiated by the solar cluster, the program for Innovation in Clean Technologies and Green Employment (Cleantech Maroc) or Bidaya, the Social Green Tech incubator that targets women with green projects. These initiatives contribute in the form of enabling a partial or full funding and technical support.

4. Challenges from the Lens of “Green Entrepreneurs”

In order to showcase the experience of the Moroccan green entrepreneurs, we have conducted a number of interviews with entrepreneurs in the context of The Next Society (TNS), a project funded by the European Commission, with the aim to highlight their major challenges, how they overcome these challenges and to study the potential impact of the The Next Society project on their businesses. The project aims to reinforce innovation ecosystems and foster the value created by innovators by providing innovative entrepreneurs with tools such as boot camps mentoring, relevant and well-focused training that will boost their businesses.

The two selected entrepreneurs have developed ‘green projects’, particularly in the field of “waste management”: Biodome and Lombrisol. Both businesses are based in Morocco and working on Biogas and Composting facilities, in order to be a part of the solutions to the increasing waste and environmental challenges in their community.

Table 1: List of start-ups that participated in the study

<table>
<thead>
<tr>
<th>Country</th>
<th>Name and website</th>
<th>Description and motivation</th>
</tr>
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<tbody>
<tr>
<td>Morocco</td>
<td>BIODOME <a href="http://www.biodomemaroc.com">www.biodomemaroc.com</a></td>
<td>The first Moroccan company specializing in the construction and installation of biogas and composting plants. Since its launch, our company has continued to grow. Based on R&amp;D, we deploy our expertise in Morocco and Africa, for in situ waste recycling and energy self-sufficiency through biogas production.</td>
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\textsuperscript{10} According to the World Bank data, enrolment rates in lower secondary education (collège) increased from 39.9 percent to 81\% percent between 2007 and 2019. Morocco has made significant strides in education, and enrollment in primary and intermediate education with levels reaching near universal for girls and boys alike

\textsuperscript{11} ILO - Country Brief Morocco: Young women’s employment and empowerment in the rural economy.

\textsuperscript{12} https://fnh.ma/article/developpement-durable/green-tech-l-appetit-debordant-des-start-up
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<tr>
<th>Morocco</th>
<th>LOMBRISOL</th>
<th><a href="https://lombrisol.ma/">https://lombrisol.ma/</a></th>
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Lombrisol is a biotechnology company that was founded based on scientific research. Lombrisol focuses on organic waste recycling using composting and vermicomposting technologies. Lombrisol aims to provide sustainable and environmentally friendly technology for organic waste recycling to produce biofertilizers for sustainable and organic farming.

According to these entrepreneurs the various constraints weakening the momentum for entrepreneurship in Morocco include:

1. **Access to finance:** The lack of financial resources was a major obstacle, especially since they could not prove to their surroundings that their projects have potentials for an economic impact and hence to find an interested investor. Another challenge is the complexity in fulfilling the requirements and providing the necessary documentation to access financial support products. The financial challenge was overcome by applying for multiple funding programs and/or resort to loans without interest from financial organizations or family funds. However, many learnt that accessing the different support programmes as well as generally accessing finance can be definitely improved by increasing the visibility of Green Entrepreneurs and by raising their profile at all levels. These approaches taught them to be flexible, visionary as well as serene when it comes to decision making.

   It is worth mentioning that the government in Morocco has provided liquidity support to SMEs and micro-enterprises. Moreover, the national recovery plan "Le Pact pour la relance économique et l’emploi" signed in August 2020 provides enterprises (with a special focus on VSEs) with optimal financing conditions to restart or strengthen their development. The programme is specially targeted to a range of industries including Green economy.\(^\text{13}\)

2. **Market accessibility:** Further aspect is the availability of the Market for green entrepreneurs. They commonly found the Moroccan market to be small and difficult to access, the size and demand are unfavorable for doing business and experts and entrepreneurs agree that the public market is virtually inaccessible. In addition to that, opportunities are perceived to be reserved to larger, more established companies, and often international ones. To that effect, consumers’ preference is being perceived to be given to better established companies or multinationals as opposed to smaller green entrepreneurship, owing to the fact that they are often perceived as less experienced or the used technology is unproven yet.

3. **Culture:** There is often a negative cultural perception that relates to setting an ‘own business’ or being an “Entrepreneur” and is often considered as a high risk investment as opposed to holding a traditional job in the government or a multinational company that would be worthy of the education received. The interviewees highlighted this challenge and found difficulty in proving the worth and success of their projects to their families and within their own communities. These misconceptions limit the support they are currently receiving — and thus their ability to scale up and make a lasting and larger impact on the green economy.

\(^\text{13} \text{Particularly, it enforces the transition to renewable energy and the development of the environmentally friendly water policy, accelerates the digitalization of the economy, adapts the tourism sector to make it grow and follow the path of sustainable land use and preserving biodiversity}\)
In addition, “green entrepreneurs” do not always identify themselves as such nor do they necessarily receive support from “green”-focused incubators. Therefore, they are not being embraced by ‘green’ focused support organisations. They also sometimes lack the necessary recognition and credibility for their pursuits.

4. **Nature of the project:** A common misconception about green entrepreneurship is that the types of technologies or services they innovate are mainly hardware in nature, which is not always the case.

5. **Challenges related to women entrepreneurs:** Women entrepreneurs, in particular, experience additional challenging issues, these were highlighted during the interview with the entrepreneurs, one of which was a woman. First, they are faced with a great deal of prejudices and stereotypes in several phases of developing their project. Women projects’ leaders are often underestimated and perceived as unable to manage or successfully run a project, as they are considered emotional and fragile to withstand the constraints of working in the field, especially when it comes to a technical or a construction project. Second, there is a misconception that women cannot be entrepreneurs as this is a time consuming job which can affect their domestic and/or families’ duties which represent a great challenge to balance their duties. Third, challenges relate to networking and creating a business network for women entrepreneurs is often difficult and is done in informal ways compared to a more professional and formal network in case of a man entrepreneur.

These challenges are in line with a regional trend, where the feminization of occupations has not started yet and the idea of gender segregation is the most prominent in these countries due to low female labour participation rate. Despite the fact that some occupations that require high educational attainment are found to witness an increase in females’ employment share, they are still male-dominant occupations.

6. **Lack of knowledge and training:** Another challenge that is faced by this young workforce is their lack of management experience and knowledge. This could be an obstacle to young entrepreneurs as there is lack of coordination between schools and businesses to prepare young people for work through education and training.

Moreover, the entrepreneurs’ highlighted that the support that they have received through the “Next Society project (TNS)” funded by the European commission have provided good support to boost their businesses. The tools provided by the project helped them solve their problems and become better at decision-making. Similarly, other entrepreneurs stated that TNS contribution was effective as it provided a network that facilitated their access to new opportunities and changed their vision of the future. Thanks to the project, entrepreneurs acquired competencies and skills including, marketing strategy, fundraising, perfecting business models and pitching about their products.

Facing challenges as a start-up is not easy and each would try to find the best way to move forward within their capabilities, particularly in the absence of an overall scheme that will provide support to the start-ups.

14 *Igniting climate entrepreneurship in morocco (Findings from the Climate Entrepreneurship and Innovation Ecosystem Diagnostic)* April 2017.
15 *FEMISE RESEARCH PAPERS 43-08 Feminization of occupations and its effect on gender wage gap in South Mediterranean Countries.* April 2019
Conclusion

Waste management represents one of the major challenges for Morocco to achieve its sustainable goals. Some efforts are put in place but it is still not enough. Moroccan civil society is increasingly vocal in its criticism of the proliferation of waste and the slow application of national strategies, both old and new. This pressure is contributing to enhancing the opportunities for a green economic growth led by entrepreneurs and civil society actors. An important trend is the forming of groups of associations that draw on the different experiences and expertise of their members to give weight to their messages.16

There is a perceived lack of policy support to green entrepreneurs. In Morocco, as the same in most of the South med countries, the policy aspects of green entrepreneurship remain relatively new, and the roles of all of the players in the ecosystem and government are still underdeveloped. Furthermore, there are misconceptions about the profile of entrepreneurs, and especially green entrepreneurs, which hamper further development of the ecosystem. The government has taken steps in the form of providing incentives for investing in start-ups and centralizing information to better serve entrepreneurs. Nonetheless, there is no widespread knowledge of these efforts among the community.

There are good opportunities for Moroccan entrepreneurs to grow, however the overall supporting environment needs more targeted intervention to enable wider access of the youth and woman entrepreneurs to the market, specifically, favourable policies, resources, and a resilient entrepreneurial-minded culture to encourage future growth.

Policy Recommendations

While Morocco is taking some slow steps towards reaching its status of key player in both climate change and related entrepreneurial issues, the country needs to focus on a number of priorities to reach this objective.

First, Morocco needs to improve the overall green entrepreneurship ecosystem with a more coherent and dynamic entrepreneurship policy, and address challenges that are still faced by entrepreneurs. More efforts are required in several key areas such as policies, markets, financing, and culture.

These could be done through a number of recommendations that tackle different levels:

1- **At the social level**: policies need to be more inclusive and encourage youth-led and women-led projects through:
   - advancing these projects on the evaluation grid of the suppliers and subcontractors in the public tenders. This could be an important step forward for inclusion and resilience of green entrepreneurship. As the entrepreneurs expressed, markets should not be limited to large companies and international ones.
   - Encouraging entrepreneurs to develop solutions using existing technologies, adapting and resizing them into the local context will increase their success factor and the funder’s trust to invest in already proven business plans. Furthermore, there should be an open dialogue between decision makers and young entrepreneurs
   - Motivating self-employment for youth by developing better access to technical education, vocational and entrepreneurial skills training with special emphasis on

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16 Climate change: waste Moroccan society’s uneven response to the proliferation of waste
green-related sectors. The education and training can highlight the existing green capacity development shortage and the lack of visibility of the green job market.

- As stated by the female entrepreneurs interviewed, women should be encouraged to be entrepreneurs by facilitating access to the authorities and increasing support programs for them.
- In order to overcome the cultural issues, green entrepreneurs and especially women need to be given higher visibility, and to set several networking events to facilitate the access to a wider and useful network of partners and clients. The idea of building up a matchmaking platform through the web could facilitate the action and improve the inclusivity.

2- **At the innovation Policy Level:** Building an entrepreneurship and innovation policy whose goal is to enable optimal and stable support to facilitate new firm creation, innovation, job creation and growth. As well as a short term strategy consisting on systematically reviewing existing policies in the area of entrepreneurship and innovation as well as regulations in the cleantech space. This should be followed by a long term strategy aiming to establish a clear, overarching policy that supports innovation and entrepreneurship.\(^{17}\)

More specifically in our context we need to ensure the integration of the green entrepreneurs’ offer into the new policy mechanisms. One example is the “TATWIR - GREEN GROWTH” program launched earlier this year, which aims to support the decarbonation of small industrial SMEs. Blending the green entrepreneurs into the mechanisms enabling them to sell their solutions to business as a part of the incentives given to the small industrial SMEs. Those mechanisms serve at pointing and identifying technological innovations that reduce human impact on the environment and consider global environmental issues such as climate change, which can make the green growth possible and open up the green market.

On the other hand, the government role is imperative in the creation of the green growth through policies and regulations, keeping in mind the establishment of a green supply chain in the market and making it more inclusive by requiring criteria for the inclusion of the weakest links in the chain, in particular young and women entrepreneurs in the calls for tenders. As mentioned above, presenting and selling the green entrepreneurs products and services as part of the incentives within the new mechanism for decarbonation might open access directly to market opportunities.

3- **At the entrepreneurial level:** Strengthening the ecosystem in order to provide cohesive support from ideation through growth stages and building a strongly networked ecosystem from governments, academia, financial sector, international organizations and the green entrepreneurs that communicate effectively on the matter.

Therefore, establishing a formal network of green entrepreneurs could have positive impacts in terms of sharing expertise and empowerment. Having a solid network will facilitate building up a matchmaking platform through the web, that could serve the action and improve the inclusivity. This kind of digital platform will provide a boost for

\(^{17}\) world bank report on Igniting climate entrepreneurship in morocco (Findings from the Climate Entrepreneurship and Innovation Ecosystem Diagnostic) April 2017.
entrepreneurs and particularly women, who have concerns with regards to their inability to create their own network and will also help match-making funders with entrepreneurs.

4- At the Funding level: The development of a specific and dedicated financing instrument for Green Entrepreneurs, that makes good use of existing public guarantees, seems the best option in the future to develop Green Entrepreneurship in Morocco. Having access to a flexible financing instrument that is adapted to their needs, will provide Green Entrepreneurs with the space to grow and build the track record that allows them to qualify for regular bank finance\(^\text{18}\).

This could be facilitated by exploring pilot innovative funding mechanisms to test the appetite for alternative funding sources to working capital for green-growth stage entrepreneurs in Morocco. This means that raising awareness about different funding mechanisms is much needed in order to increase access or de-risk finance for green small and growing businesses.

More particularly, green entrepreneurs should be considered as a priority category to benefit from the new “INTELAKA” program which was built around an improved and adapted financing mechanism. This new guarantee instrument consists of different funding instruments among them “Damane Intelak”, whose guarantee rate amounts to 80% of loans below 1.2 million dirhams, targets auto-entrepreneurs, young graduates, Micro and Very small businesses, the informal sector and small businesses exporting to Africa. It concerns companies in the creation phase or created for less than 5 years, knowing that this phase proves to be the most critical in the life cycle of each company.

5- At the market level: Increasing number of high growth green ventures scaling up to broader levels of initiatives that have proven successful in supporting green high-growth enterprises.

Hence, the idea of initiating an international matchmaking program would aim to bring in existing business models and proven technologies to Morocco, while scaling up to broader level initiatives that have proven successful in supporting green high-growth ventures. Expanding Market Information for Entrepreneurs will increase growth opportunities and encourage broad market information on green sectors and intelligence to be mainstreamed into Moroccan organization’s mandates and disseminated on the web\(^\text{19}\).

More locally, a sponsorship program for young green entrepreneurs by companies that are larger and better integrated in the sector could be useful in their initiation into the market, making it possible to capitalize on the experience and know-how of the sponsors and gain confidence in order to face the challenges better.

\(^{18}\) UfM : Enabling access to finance for green entrepreneurs in southern mediterranean countries.

\(^{19}\) World bank report, 2017 on Igniting climate entrepreneurship in morocco (Findings from the Climate Entrepreneurship and Innovation Ecosystem Diagnostic) April 2017.
Entrepreneurs who participated in this study

Biodome – Fatima Zahra Beraich

Fatima Zahra BERAICH, Engineer and Doctor of State in Industrial Processes and Environment of the Hassan First University of Settat, founder of "BIODOME.SARL", specialized in the construction of biogas and composting installations. Having in account about ten Patents of inventions deposited in the national and international and scientific publications. Expert in waste management, solution/result oriented with an excellent strategic-operational balance. Recipient of the financial grant from the MASEN solar cluster program (FT2M), Switcher in 2015 from the Switch Med and SCP / RAC program, winning finalist at the International Francophone Forum, organized by the OIF. Awarded at the COP22, best GCIP Morocco 2016 award of the woman entrepreneur, at the Global Clean Technology Innovation Program (GCIP), Awarded in 2018, by the Moroccan Prime Minister at the annual contest "Tamayuz", best woman entrepreneur of the year, and other nominations.

Lombrisol – Barhoum Kharbouch

Barhoum Kharbouch is a doctor in environmental biotechnology 2018, following a thesis under the co-direction of two thesis directors the first in Morocco (Laboratory of Biotechnology and Valorization of Natural Resources (LBVRN),) the second in France (Laboratory of Environmental Biotechnology and Chemometrics). He is also the founder of the startup Lombrisol, which is a biotechnology company that focuses on organic waste recycling using composting and vermicomposting technologies. It offers an economical and sustainable ecological solution for the treatment and recovery of organic waste, based on vermicomposting (use of earthworms).
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