

January 16th, 2017



**BUSINESS  
PLAN  
PROPOSAL**

# GREEN ROOFS



**Sekolah Tinggi Pariwisata Nusa Dua Bali | Merrie Augustine de Vink**

**Name : Merrie Agustine de Vink**

**School : Sekolah Tinggi Pariwisata Nusa Dua Bali**

**E-mail address : merrieagustinedevink@zoho.com**

- 1. Describe a business practice you believe should be adopted (or adopted more widely) so as to effectively and efficiently promote the goals of sustainable tourism in Indonesia. Answers should not exceed 300 words.**

I believe the optimum business practice that should be adopted in Indonesia is the green roofs practice. Green roofs -sometimes referred to as 'vegetated roofs' or 'eco-roofs'- consist of a waterproofing membrane, growing medium (soil) and vegetation (plants) overlying a traditional roof. Green roofs are utilized to achieve environmental benefits, which includes reducing stormwater run-offs, energy usage, the heat island effect and many others. This practice may even help mitigate some of the negative effects of the urban landscape by reintroducing a natural landscape into urban environment without making major changes to a city's infrastructure. As we know, there are many buildings that were built in Indonesia, especially in the tourism sections without using any green roofs on it, which can increase the temperature and energy usage, consequently deteriorates the air quality and effectiveness of the stormwater management. Because of those issues, I believe that in order to achieve sustainability, especially for the tourism in Indonesia, we should all start taking the necessary actions. Raising the awareness and eventually implementing this green-roof practice into our country would be an innovative and favourable action. This innovation would help shift the public's general mindset, promoting the fact that benefits do not only from the money we get or save, but also by protecting the natural resources which will attract more and more tourists to visit our country because of its beauty.

- 2. Describe the environmental problem or challenge this business practice is intended to address (including a description of the magnitude and consequences of this problem or challenge). Answers should not exceed 200 words.**

The environmental problems this business practice intended to address are the air and water pollutions from the new and growing industries, especially in Indonesia's big cities. Air pollution is caused by rapidly rising levels of motor-vehicles emissions and by forest fires linked to palm-oil development. Air pollution also includes particles of soot, organic hazardous material, heavy metals, acid aerosols and dust, which are very dangerous for people's health. Aside from the air pollution, water pollution is also dangerous. Water pollution is caused by improper disposals of solid wastes to the rivers or canals and the shortage of sewerage facilities by the industries. When the air pollution's compounds like sulfur dioxide and nitrogen oxides mix and react with water, oxygen, and other chemicals from the water pollution, this process will cause acid rain that is extremely harmful the environment and people's health.

**3. Explain how your proposal solves or mitigates this environmental problem or challenge. Answers should not exceed 300 words.**

I believe that by implementing the green-roof practice, we may be able to overcome the aforementioned problems. Green roofing gives us many benefits, not only for the owner of the business and the communities, but also directly to the environment. Some of the benefits are explained as follows. First, green roofing can neutralize acid rain effect by planting vegetation on green roofs which can absorb the air pollutants. Second, green roofing can reduce carbon monoxide impact because a green roof could be used as a carbon sink that provides a mandatory cap on carbon emissions. Third, green roofing can prevent combined sewer overflow by using a stormwater management that reduces the rate of run-offs from a roof by 65%, thus reduces the chances for floods. Fourth, green roofing provides habitat for wildlife in urban areas by increasing local biodiversity that will help ecosystems to continue to function even when they are 'disturbed' by industrial development. Fifth, green roofing can also help energy saving by reducing the amount of energy building uses for cooling in dry season and heating in wet season. Sixth, green roofing can improve aesthetics by creating an attractive space for tenants and occupants of neighboring buildings. Seventh, green roofing can provide new amenity spaces for refuge and relaxation such as community gardens, commercial space and recreational space. These are some of the abundant benefits that we can gain if we implement this business practice in our tourism industry. I believe that if the government and the investors are willing to cooperate to run this business practice, the development of the tourism industry in Indonesia will be secured and sustainable.

**4. Identify the costs and barriers to implementing this business practice and explain how these costs and barriers might be managed. Answers should not exceed 300 words.**

The costs of implementing a green roof business practice are divided in 2 parts, there are the installation cost and the maintenance cost. The typical installation cost for a green roof depends on its size, with the price per square foot decreases as the size increases. Based on the research in Washington D.C., the cost premium of installing an extensive green roof ranges from \$10.30 to \$12.50 per square foot, while installing a semi-intensive green roof costs from \$16.20 to \$19.70 per square foot. The first few years of a green roof's existence are considered an establishment period, in which maintenance is critical to the roof's long-term success. Annual maintenance of green roofs costs from 21 cents to 31 cents per square foot per year. Maintenance costs will be higher any time a green roof includes a landscaped design, as workers will also need to spend time maintaining the design aesthetic. A typical maintenance crew includes two workers, though more may be needed for a larger roof. Different from the costs, the major barriers to the implementation of green roofs are unfamiliarity of the practice, as it hasn't been widely implemented in Indonesia, risks in this new green-roof technology that means a much greater opportunity for something to go wrong as compared to traditional roofs, complicated maintenance procedures of a green roof will solely rely on the roof system and what is required from it and many others. Because of those, we need to follow the standards based on the German FLL guideline and learn from their experts.

- 5. Identify potential alternative solutions to the challenge and explain why your proposed solution is the best option. Answers should not exceed 300 words.**

The potential alternative solutions to the challenge is to educate Indonesian people about the green roofing practice, which includes the procedures, the benefits, the consequences, the costs and the challenges to green roofs construction. Since the green roofing isn't familiar enough in Indonesia, we surely need experts to educate us. Based on the research that I found, the German FLL guideline and their experts can teach people to built a green roofs based on the guideline. There should be a cooperation between the German FLL members and the Indonesian Government so we can get support from their experts to implement this business practice easier. Besides that, the investors also need to get involved and take part of this changes, so they can implement this business practice in their own buildings or industries. I believe if we can educate many Indonesian people and encourage the Indonesian Government and the Investors in Indonesia about the importance of the green roofing practice in many building and industries especially in tourism industry, the tourism industry itself will be sustainable for a very long time.