

The nexus of green strategies in ascertaining sustainable private *Tahfiz* institutions in Malaysia: A proposed model



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ABSTRACT

The administration of most private *Tahfiz* institutions (PTIs) in Malaysia is beset by problems of infrastructure standard, total dependence on government assistance, poor Waqf fund management, public fundraising accountability issues, and financial resource constraints. Therefore, this paper proposes the Conceptual Framework of Sustainable *Tahfiz* Model (STM), which integrates three main scopes, i.e., Rainwater Harvesting System (RWHS), Renewable Energy Strategies (RES) and Food Subsistence Strategies (FSS). The nexus of such a green approach requires an ecological footprint in producing and consuming food through a series of connections between energy and clean water. Evidently, this is an alternative in maximizing existing resources and at the same time to generate extra income for PTIs in Malaysia to improve their sustainability. This is parallel with the Government policy known as the National *Tahfiz* Education Policy (DPTN) that aims to achieve a nation-wide sustainable *Tahfiz* with a good quality of students.

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1. Introduction

In establishing sustainable *Tahfiz* institutions, a significant model is needed, especially in ascertaining the model to be adaptable by *Tahfiz* institutions. The major aim is to focus on how these institutions can become less dependent on the government, especially to be less reliant on the national fiscal through the nexus of green technologies. Achieving these economic-less-dependent strategies requires a reduction in the ecological footprint by changing the way the institutions produce and consume goods and resources. Efficient management through shared natural resources and the way to renew/recycle energy and water are some important strategies in order to achieve such a goal.

This study foresees a collaborative investigation in utilizing the (i) renewable solar energy, (ii) rainwater harvesting, and (iii) self-produced food consumptions in the effort to be more resource efficient and economical. Designing such ecosystem

of various natural and artificial systems together with nutrient cycles will lead to stable, autonomous green paradigm that is self-renewing and self-sufficient. Therefore, encouraging the *Tahfiz* institutions and consumers to implement these strategies is important, as it is supporting developing countries to move towards more sustainable patterns of consumption by 2030.

2. Conceptual framework of sustainable *Tahfiz* model (STM)

The establishment of *Tahfiz* institutions in Malaysia has received encouraging response from society. It is meant to meet the aspiration of mainstream Islamic education in order to produce high-quality *huffaz* generation and to contribute towards national development. Nevertheless, the standard of *Tahfiz* infrastructure and management is not uniform and need huge expenditure since the background of the establishment of each institution varies, especially between Private *Tahfiz* Institutions (PTIs) and public *Tahfiz* institutions (Ridza et al., 2017). In addition, poor infrastructure of the *Tahfiz* institutions (Ridza et al., 2017), followed by unorganized *tahfiz* management system in its effort to seek for financial resources has affected the sustainability of *Tahfiz* institutions (Nawi and Salleh, 2017). To make things worse, there are issues of accountability involving illegal fundraising and

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mismanagement of the collected funds for PTIs (Bani et al., 2017; 2014). Thus, a more secure financial aid from the government is necessary to govern and maintain the PTIs in Malaysia. Even in the National Tahfiz Education Policy ('Dasar Pendidikan Tahfiz Negara'), it is evident that RM 30 million is needed to manage and develop the Tahfiz institutions.

However, the question may arise on how long will these institutions rely on the government fiscal? Appropriate actions should be taken to allow these Tahfiz institutions to be sustainable, specifically in founding huffaz education lifelong learning. Under the Malaysian GTP and NBOS in 2013, the strategies towards the Malaysian development are the ability to have sustainable finance. Among the actions taken is to encourage educational institutions to follow an entrepreneurial model in order to balance government fiscal education. This strategy involves the ability to have financially-sustainable education bodies through diversifying income streams. If an effort is made to allow the huffaz to be

entrepreneurs at the same time, this will assist the institutions to have a more sustainable financial mechanism. Among the potential of entrepreneurship are the exploration of the food sector (edible herb garden), the energy sector (renewable energies), and water-saving management (rain-water and grey-water harvesting). Through the nexus of green technologies, it may help the PTIs to be sustainable in management as well as in financial capabilities.

Fig. 1 highlights the importance of establishing a nexus between 3 main sectors, i.e., water, energy, and food, in improving financial resource management and education constraints that will directly affect the huffaz academic performance. Under the Malaysian Government Transformation Programme (GTP), TN50, and National Blue Ocean Strategy (NBOS), the government is encouraging people to be more innovative in order to achieve sustainability in their life.

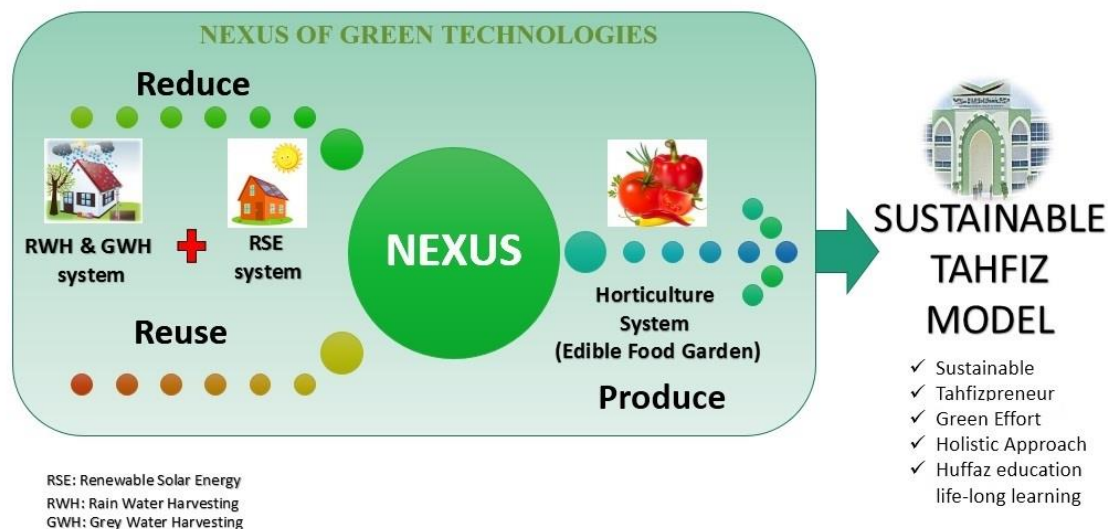


Fig. 1: Conceptual framework of sustainable Tahfiz model

This is in line with the core principle of "Majlis Tahfiz Negara" to raise the ratings of private Tahfiz institutions in Malaysia. One of the ways is by securing energy, water, and food resources. If Tahfiz institutions are able to achieve and sustain these three resources, a sustainable Tahfiz model can be ascertained, and a community of "Tahfizpreneur" can be developed. The Tahfizpreneurship is a concept of integral components of entrepreneurship element within Tahfiz governance that is established as an effort to empower private Tahfiz institutions and to improve the institution survival (Anas et al., 2019; 2018). This concept is significant in nurturing Tahfiz education as a lifelong learning process among the students of Tahfiz institutions in a professional way. Issues of accountability among private Tahfiz students during fund funding (e.g., street-fund collecting, box-fund collecting) can be avoided and later to be improved based on a new holistic approach.

The global sustainable community model that has introduced the Eco-village and Co-housing model can be set as one of good examples. The model has shared the same socio-economic and cultural-spiritual values in finding the significant a solution in securing water, energy, and food, whilst creating a source of income for the community (Mabrey and Vittorio, 2018). If the approach is followed and it suits the Tahfiz needs, a self-sufficient and sustainable Tahfiz institution is possible to be established. In fact, self-sufficient income is not a new scenario among communities in other countries, yet, it is unfamiliar among communities in Malaysia. Many scholars have strengthened that utilizing green technologies is an innovative way to generate extra income for people (Anadon et al., 2016).

The Malaysian government has recognized this issue and has put great emphasis on it through the National Key Result Areas (NKRA) along with the Ninth Malaysia Plan's objectives to make the nation more self-sufficient (Siddiquee, 2014). Considering

the fact that water, energy and food sectors play an important part in society, this research attempts to explore opportunities for co-locating the technologies and strategies in local Tahfiz institutions in order to help the people to have a self-sufficient economy and sustainable resources. Many PTIs in Malaysia, especially in suburban and rural areas, tend to have a large compound area. Nevertheless, a large area is not fully utilized. It is a waste to have large such areas without any activities which are actually significant in generating energy, water, and food and, at the same time to provide income for Tahfiz institutions. Not only that, but this research also tries to explore the potential of utilizing the large area of Tahfiz compound as the co-location of renewable energy technologies (e.g., solar energy), water harvesting technologies (rain and grey water) and food production strategies. Thus, it will encourage a resilient practice for Tahfiz institutions in generating independent income and, at the same time, establishing the Tahfiz buildings as a hub to help the huffaz communities to be more sustainable in accommodating water, energy and food resources. With this effort, it will later minimize the insecurity issue and financial vulnerability of the Tahfiz communities through the nexus of green strategies, and most importantly, it will create a sustainable Tahfiz community.

3. Scope of STM

3.1. Water harvesting strategies (Rain-water and grey-water strategies)

Malaysia is a tropical country that is rich in water resources, and it receives an average rainfall of about 2400mm or 324 billion m³ per year (Che-Ani et al., 2009). Rainwater Harvesting System (RWHS) or roof water harvesting is a simple method that uses scientific techniques to store rainwater that falls on the roof surfaces into the storage for daily use such as bath, laundry, toilets, and garden watering. This method involves the collection, storage, and distribution process of collected rainwater (Che-Ani et al., 2009).

RWHS is able to provide a lot of benefits, environmentally, economically, technologically, and socially. In terms of environmental advantages, the installation of RWHS is capable of reducing the dependency on treated water sources (Coombes and

Barry, 2007) and as an alternative source of water during a water shortage. From the economical aspect, RWHS can reduce the cost of treated water supply, and this may save the bills of tenants (Tam et al., 2010). The technology advantages given by RWHS installation is effective stormwater control as it can be considered as flood mitigation technology (Farahbakhsh et al., 2009). In addition, RWHS can reduce the burden of the government to provide water supply to the society in order to meet the increasing water demand (Che-Ani et al., 2009; Coombes and Barry, 2007). Fig. 2 shows a rainwater harvesting system.



Fig. 2: Rainwater harvesting system (Gautam, 2017)

3.2. Renewable energy strategies (Solar energy)

Solar energy generated by electricity from the panel assembled on the roof of Tahfiz centre is, in fact, can reduce the cost of electricity bills. Not only that, the excessive energy generated from the panel can be sold back to the grid through a program is known as Net-Energy-Metering (NEM) scheme. This is significant in the concept of "Tahfizpreneurship" in which this research attempts to introduce. Undoubtedly, it can foster the spirit of lifelong learning among huffaz generation through technology and, at the same time, may promote a green living environment in the Tahfiz institutions.

The infrastructure such as buildings in Tahfiz compound can be a focal point to collect solar irradiation, and through proper distribution board (DB) system, the energy can supply power for lighting and better mechanical ventilation system for the Tahfiz buildings. It can also be integrated with the co-location of fertigation plants under the panels (Solar farm). Fig. 3 shows the nexus of solar energy applications.

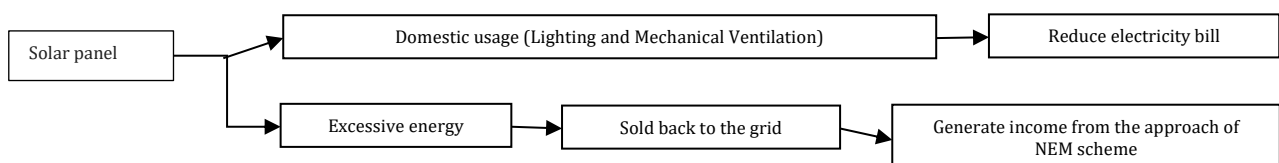


Fig. 3: The nexus of solar energy application

3.3 Food subsistence strategies (Edible garden and horticulture)

According to Ackerman et al. (2014), food subsistence may not only strengthen social ties, but

it also provides healthy sustenance that might be lacking. In addition, it can generate income to the institutions, reduce food expenditures, and create job opportunities. In other words, food subsistence

encompasses all three pillars of sustainability, i.e., economy, society, and environment.

Therefore, the integration system proposed in this study involves growing vegetables and edible plants through a fertigation system, which is supported by the energy supply from the solar photovoltaic and water consumptions from the rainwater harvesting (RWH) system. It is a symbiotic environment where the water circulated in the RWH system is filtered out, and the cleansed water is re-circulated back for the growth of the vegetable in the fertigation system. Since water is being re-circulated within the system, this cycle is considered efficient in handling a significant scale of self-produced food, nutrients, and expenses in the Tahfiz institutions. Furthermore, the food and plant waste is significantly eligible and manageable to be continuously cycled within the energy-food chain supply. Fig. 4 shows food subsistence strategies.

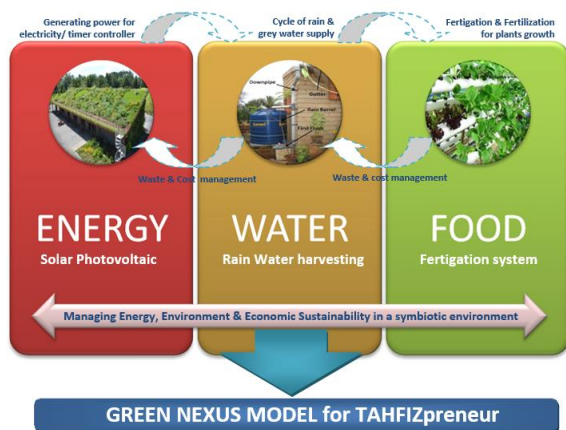


Fig. 4: Food subsistence strategies

3.4. The Tahfiz communities-current situation and issues

Governance of the PTIs is most of the time plagued by poor infrastructure standard, non-uniform and weak standard of governance relying solely on government aid, waqf funds, issues of public fund-raising accountability, and financial constraints. Therefore, the Tahfizpreneurship concept implementation through the Sustainable Tahfiz Model is the best alternative to overcome such problems for the sake of achieving the goal of DPTN, i.e., to produce 125,000 quality huffaz by 2050. Fig. 5 explains the scope of research, i.e., connecting 3 nexus of green strategies towards establishing the sustainable Tahfiz model in Tahfiz development in Malaysia.

4. Benefits, technology transfer and expected outcomes

4.1. Benefits

- Effective Reduce-Reuse-Generate concept of application for PTIs in Malaysia.

- Solar energy generated by electricity can reduce the electricity bills, and the excessive energy generated from the panel can be sold back to the grid through a program is known as Net-Energy-Metering (NEM) scheme.
- Rainwater harvesting system can save the water bills, which is later can be used as a source of irrigation of the proposed horticultural system.
- Horticultural products are able to generate an institutional side income, which may improve current financial issues.
- Institutions are no longer entirely dependent on funds, grants, donations, and charities yet are able to stand alone to generate revenues for the future growth of the institutions.

4.2. Technology transfer

The outputs of the projects will be transferred through the development of a significant model that is adaptable by all PTIs in Malaysia. The knowledge transfer of the application technology involves:

- Solar energy technology,
- Rainwater and greywater harvesting technology,
- Horticulture technology for vegetation.

4.3. Expected outcomes

- A new model approach to the contributing factors that allow the integration of green strategies generated that can be used towards income generation for Tahfiz communities.
- A new self-sufficient concept of STM which encouraging every Tahfiz institution to explore various supplementary resources from water resources, energy generation, and food production - in a shared location that can provide sustainable living concept and at the same time can provide income to them.
- A new low-cost solution for local Tahfiz institutions to become more financially-sustainable and to establish Tahfizpreneur community.

5. Example of successful precedent cases

There are precedent cases that are successful in implementing a similar approach that integrates the nexus of energy, water, and food. However, most of these cases are located overseas. The example is as follows.

5.1. Green school in Bali, Indonesia

One of the successful examples is Green School, located in Bali, Indonesia. It is a private and international pre-kindergarten to a high school founded by John Hardy since 2008. The school integrates green concept which cultivates green gardens as the educational tools for students and at the same time, the crops from this garden generates income for the school. This school also integrates a

mini solar farm, and micro-hydro power to generate owns electricity.

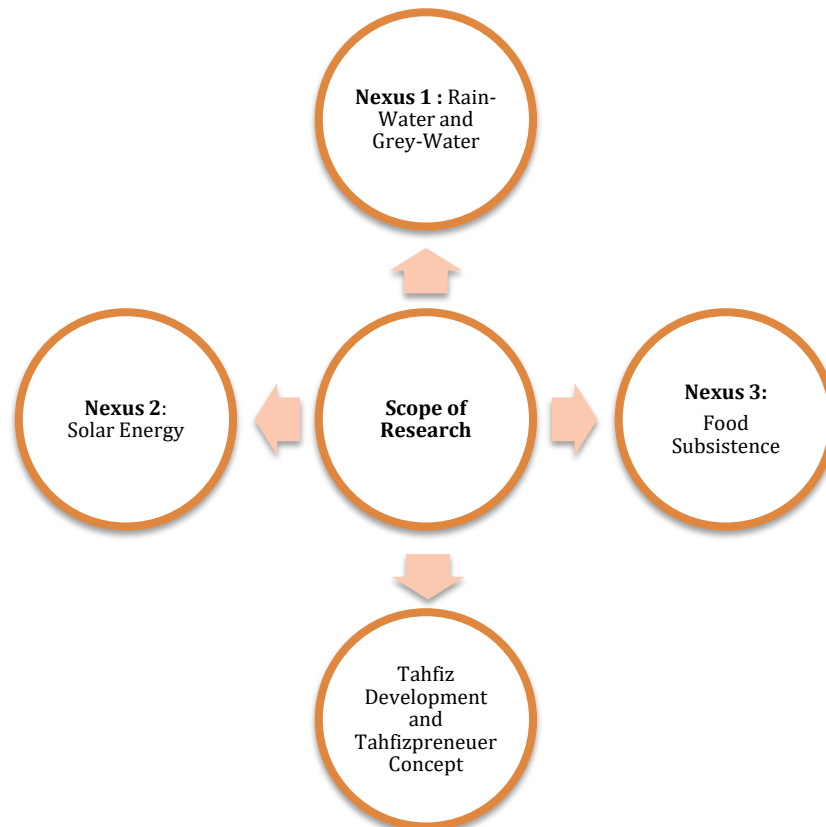


Fig. 5: Sustainable Tahfiz model (STM)

5.2. Eco school in Shinanodai, Japan

Another example of the successful cases is Eco Elementary School, located in Shinanodai in the district of Aichi, Japan. The school integrates natural ventilation within its open-design concept, with no-wall, and allows a cool breeze to ventilate the area. It also uses solar electricity, which used to power the building, and the remaining excess of energy is sold to the grid, which provides income to the school. The school also used a rainwater harvesting system for the toilets, and the water from their swimming pool can be used as drinking water during an emergency. There is a small herb garden around the school for eco-educational purposes.

6. Conclusion

Sustainable Tahfiz Model (STM) integrates three main scopes, i.e., Rainwater Harvesting System (RWHS), Renewable Energy Strategies (RES), and Food Subsistence Strategies (FSS). It is considered as an alternative in minimizing the resources and at the same time to generate side income in PTIs in Malaysia. Indeed, to achieve DPTN in which to produce 125,000 quality huffaz in Malaysia is the main target behind this implementation.

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Compliance with ethical standards

Conflict of interest

The authors declare that they have no conflict of interest.

References

- Ackerman K, Conard M, Culligan P, Plunz R, Sutto MP, and Whittinghill L (2014). Sustainable food systems for future cities: The potential of urban agriculture. *The Economic and Social Review*, 45(2): 189-206.
- Anadon LD, Chan G, Harley AG, Matus K, Moon S, Murthy SL, and Clark WC (2016). Making technological innovation work for sustainable development. *Proceedings of the National Academy of Sciences*, 113(35): 9682-9690. <https://doi.org/10.1073/pnas.1525004113> PMID:27519800 PMCID:PMC5024592
- Anas N, Samori Z, Hamid MY, Zulkipli SN, and Noor MSM (2019). Private tahfiz institution governance: A proposed transformation via social entrepreneurship model. *Academy of Entrepreneurship Journal*, 25(1).
- Anas N, Zulkipli SN, Noor MSM, Ahmat AC, Salleh MH, and Hussein H (2018). Transformasi tadbir urus institusi tahfiz swasta (ITS) di Malaysia melalui model keusahawanan sosial. In *The 5th World Conference on Islamic Thought and Civilization*, Ipoh, Malaysia: 45-56.
- Bani H, Jaaffar MY, Katan M, and Noor AHM (2017). An overview of governance and accountability of tahfiz institutions in

- Malaysian: Religious councils perspective. In the 4th International Conference on Governance and Accountability, SHS Web of Conferences, EDP Sciences, 36: 00028.
<https://doi.org/10.1051/shsconf/20173600028>
- Bani H, Katan M, Noor AHM, and Fatah MMA (2014). Applying stakeholder approach in developing accountability indicators for tahfiz centers. In the International Conference on Accounting Research and Education: 1-14.
- Che-Ani AI, Shaari N, Sairi A, Zain MFM, and Tahir MM (2009). Rainwater harvesting as an alternative water supply in the future. European Journal of Scientific Research, 34(1): 132-140.
- Coombes PJ and Barry ME (2007). The effect of selection of time steps and average assumptions on the continuous simulation of rainwater harvesting strategies. Water Science and Technology, 55(4): 125-133.
<https://doi.org/10.2166/wst.2007.102> PMID:17425079
- Farahbakhsh K, Despains C, and Leidl C (2009). Developing capacity for large-scale rainwater harvesting in Canada. Water Quality Research Journal, 44(1): 92-102.
<https://doi.org/10.2166/wqrj.2009.010>
- Gautam R (2017). Potential of rainwater harvesting in Nepal: A case study of Kathmandu. M.Sc. Thesis, Norwegian University of Life Sciences, As, Norway.
- Mabrey D and Vittorio M (2018). Moving from theory to practice in the water–energy–food nexus: An evaluation of existing models and frameworks. Water-Energy Nexus, 1(1): 17-25.
<https://doi.org/10.1016/j.wen.2018.04.001>
- Nawi NHM and Salleh NH (2017). Pembinaan model pengajian tahfiz di Malaysia. O-JIE: Online Journal of Islamic Education, 5(1): 1-11.
- Ridza BH, Jalil RA, Sipan I, and Nukman Y (2017). Critical success factor (CSF) service delivery for tahfiz institution teaching and learning environment. In the AIP Conference Proceedings, AIP Publishing LLC, 1903(1): 040003.
<https://doi.org/10.1063/1.5011522>
- Siddiquee NA (2014). The government transformation programme in Malaysia: A shining example of performance management in the public sector? Asian Journal of Political Science, 22(3): 268-288.
<https://doi.org/10.1080/02185377.2014.943256>
- Tam VW, Tam L, and Zeng SX (2010). Cost effectiveness and tradeoff on the use of rainwater tank: An empirical study in Australian residential decision-making. Resources, Conservation and Recycling, 54(3): 178-186.
<https://doi.org/10.1016/j.resconrec.2009.07.014>