

Sustainability Practices in Higher Education

TOWARD A QUINTUPLE BOTTOM LINE IN HIGHER EDUCATION INSTITUTIONS

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ABSTRACT

As the “trendsetter in education,” the experiments and experiences of Mar Athanasios College for Advanced Studies Tiruvalla (MACFAST) already show it to be an exceptional model of education, innovation, and sustainability that leverages the triple bottom line (TBL), focusing on how projects disturb the *planet*, affect *people*, and address *profit*. Yet MACFAST added two more areas of concern—the *passion* for study and the *purpose* of life, making for a *quintuple* bottom line. Such a “MACFASTian” praxis for action and reflection is evident in various projects. For example, MACFAST became the first education institution in India to be fully-powered by solar and energy self-sufficient. The college also began the Clean and Green Campus project, an awareness-action-research programme that was subsequently expanded into a campaign for the surrounding town—Clean and Green Tiruvalla—which eventually led to an award for best municipality in the state. MACFAST’s “go green” praxis has resulted in biogas generation from toilets for use in various cooking purposes, and the institution owns the first campus-based community radio station in the country, Radio MACFAST 90.4, which has become one of their main sources of income. Indeed, by rereading its vision both in continuity with and discontinuity from tradition, MACFAST innovations continue to rise and endure, allowing their brand to remain noticeably secular, neutral, inclusive, and professional.

KEYWORDS

sustainability; quintuple bottom line; praxis for action and reflection; innovations

Established in 2001 in Tiruvalla, Kerala, India at the peak of the information and communications technology (ICT) revolution in the country, MACFAST (Mar Athanasios College for Advanced Studies Tiruvalla) has demonstrated itself to be an exceptional model of education, innovation, and sustainability through its experiments and experiences which contributed to its reputation as the “trendsetter in education.” These earned for the institution an “A” grade of excellence (the highest being A++) from the National Assessment and Accreditation Council, the body in charge of assessing and accrediting higher education institutions in India, within 16 years of its inception. Their model leverages the triple bottom line (TBL; Elkington, 1994) which focuses on how organizations impact the *planet* and ecosystem, *people* and social systems, and address *profit* and economic growth.

MACFAST, however, has added two more bottom lines since—the *passion* for study and the *purpose* of life, making for a quintuple bottom line of development associated with 5 Ps. It has introduced a fresh thinking of “continuity and discontinuity” with and from the traditional educational system, holding forth an inclusive model of education that constantly drives innovation for sustainability.

A CONTINUITY WITH AND BREAK FROM THE TRADITION IN EDUCATION

Most Christian colleges in Kerala are usually named after saints and/or great personalities. A break from the traditional educational scheme thus began with the selection of the name “MACFAST” and its tagline. Doing things differently, the management of the college was keen to adopt an acronym that pleased both the brand consciousness of contemporary society and the educational legacy of the Church. Such a name appeared “unconventional” for some time, however, and so the name “Mar Athanasios College for Advanced Studies, Tiruvalla” was used at first for official documents, with “MACFAST” appended inside parentheses. Within a year, the university and the education circle eventually began accepting MACFAST as a brand, and it emerged as a trendsetter in education, one that is noticeably secular, neutral, inclusive, and professional.

MACFAST: TOWARD A BRAND IN EDUCATION

The need for brand recognition, common in industry and for products, influenced the professional approaches of MACFAST as it set its vision and the construction of its building and facilities. As the name itself implies, MACFAST began pioneering new courses (advanced studies) that associated its brand with the promotion of cutting-edge technologies, frontiers of sciences, and management innovation. Not only does MACFAST as a brand in education help with top-of-mind recall, it is also a symbol of intangible assets like goodwill, confidence in the quality of education, and reliability in service.

The brand set forth both interdisciplinary and multidisciplinary approaches that were little known in Kerala's educational environment. A clear example of such is the dynamic field of bioinformatics, which is a confluence of molecular genetics and IT. Apart from pioneering new courses like this one as well as Food Science and Technology and Plant Biotechnology, MACFAST also introduced Phyto-Medical Science and Technology, a very unique program that is envisioned as a research scheme for developing drugs from the medicinal plants of the Western Ghats of Kerala, one of the world's 36 biodiversity hotspots. The MACFAST brand has also extended to MACFAST Films, RADIOMACFAST 90.4 FM, MACFAST Travels, MACFAST Foods, the MACFAST Clean and Green Project, MACFAST Solar, the MACFAST Medicinal Garden, MACFAST Technologies, the MACFAST Industry Interface (MII), the MACFAST Knowledge Scheme (MAKS), MACPRENEUR, and the MACFAST Centre for Industrial Interface Private Limited Company.

THE MACFAST QUINTUPLE BOTTOM LINE

Though it started out as a self-finance college, the ultimate aim of MACFAST was to become a self-sustainable institution within 10–20 years of its establishment. The MACFAST model uses as its North Star the United Nations' sustainable development initiatives that focus on economic growth, socially inclusive development, and protection of the environment for future generations (WCED, 1987). Two more bottom lines then round out this framework, namely, "the passion for study" and "the purpose of life." Education, innovation, and sustainability for MACFAST are thus founded on a quintuple bottom line of development (Figure 1).

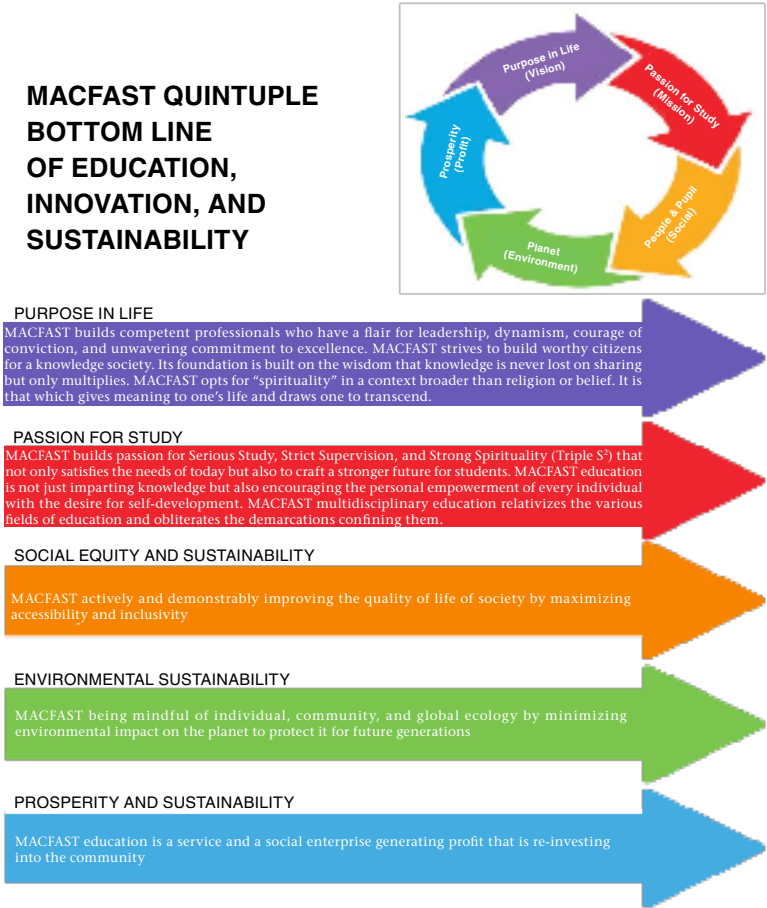


Figure 1: MACFAST Quintuple Bottom Line of Education, Innovation, and Sustainability

The phrase “triple bottom line” (TBL), first articulated in 1981 by Freer Spreckley in a publication entitled *Social Audit: A Management Tool for Co-operative Working*, was expounded upon more fully by John Elkington in his 1997 book *Cannibals with Forks: The Triple Bottom Line of 21st Century Business*. The argument is that change is essential for enterprises and projects when it comes to accounting for, measuring, and reporting their financial performance, which has been calculated almost exclusively on the basis of business profit and loss or what is called the “bottom line.” Social wealth creation and environmental responsibility were added to the mix, with the TBL approach alleging that the current economic policy exploits the resources of the planet to make huge profits while giving no pre-eminence to humanity or

ecosystem. TBL, in contrast, expresses the need for sustainability, efficiently and humanely using the resources of the planet while making reasonable profits.

Historically, the emergence of the TBL model is due to the collapse of the 20th century's aid model of development. To elaborate further, the colonial economy concentrated mainly on exploiting the resources of the colony instead of on developing and protecting people. The capital of corporations and colonial masters became a tool of the oppressor for profiting by any and all means. They used cheap labor, for instance, as well as an abundant supply of resources. Colonies and its native peoples as such remained poor while the elites of the colonial nations continued to benefit. The development model during this period can thus be called the single bottom line approach.

The post-colonial era, however, gave rise to the development agenda of countries, which was later taken by the United Nations to be a developmental agency. This means countries started plans to eliminate poverty and underdevelopment. Infrastructural projects like roads, hospitals, and educational institutions, for instance, became fundamental in countries' agendas for progress. India, for example, began its Five Year Plans and the Planning Commission. Dams were built to support and enhance agricultural production, schools and colleges were established to educate the masses, IITs and higher institutes were opened to develop science, technology, space, atomic energy, etc. Private corporations, too, shared this progress model, which was always based on the single bottom line, that is, making a profit.

Sustainable development as an agenda for progress was little known or of little concern for the majority over the last few decades. Even the United Nations focused mainly on aid funds for development, such as food aid or help for water, health, sanitation, etc. A new understanding, however, came through the revolutionary triple bottom line, which the United Nations now champions the world over. A public consciousness had been surging for the last sixty years through the interventions of environmentalists and social justice advocates who continue to bring forth a broader definition of the bottom of line of progress that introduced full cost accounting. Such a model demanded an inclusive proposition that assessed ecological impact and social cost without resorting merely to profit or prosperity.

Almost all companies, for instance, exploit natural resources like water, oil, copper, iron, etc. either as raw materials for manufacturing or for their own use.

These corporations, however, along with government companies even, show only monetary profit in their accounting. They never calculate the costs of polluting the environment and the social cost of hospitalizing those affected by pollutants. Stories of catastrophes like the Bhopal tragedy, indirect health hazards of exposure to asbestos, copper mines polluting rivers, oil spills in the sea, ecosystem degradation due to CO₂, etc. continue to be recurring nightmares. Indeed, while governments are spending boatloads of taxpayer money on health care and cleaning up, corporations make big profits without deeming as necessary the scruples of reasonably doing no harm, minimizing environmental impact, providing employees with good working conditions, developing more employment opportunities for the community, and ensuring that exploitation is minimized or eliminated.

The vision and mission of MACFAST were thus conceived not only from the TBL approach but also from the passion for study and purpose of life, thereby bringing a paradigm shift in education. The school believes in enhancing the potential of young Indians by providing them with education, jobs, and a spirit of entrepreneurship. Indeed, offering such a holistic education backed by cutting-edge science and technology can help eliminate poverty and underdevelopment which are caused largely by human systems. As such, MACFAST opted for the following vision statement: "To transform young people and mould them into value driven, culturally enriched and professionally competent change agents who would significantly contribute to improving their immediate community, the state, the country and the world at large" (MACFAST, n.d.c). To accomplish such a vision and transform young people into change-agents, the school in turn proclaimed its mission to be thus: "To raise the college to a level of excellence so as to place it among the top IT, BT and B-schools" (MACFAST, n.d.a).

MACFAST's Quintuple Bottom Line, in short, is an approach that not only focuses on the concept of sustainability in terms of profit, people, and planet as in TBL but also emphasizes a passion for study along with the meaning of one's purpose of life and spirituality. The success of MACFAST education is thus evaluated both as a service and as a commitment to generations.

MACFAST BENCHMARK FOR SUSTAINABILITY

MACFAST defines sustainability as the totality of the social, environmental, and economic responsibility of human beings toward the ecosystem along with its trustworthy usage, service, and protection as the entrusted resource of the planet in an equitable, accountable, available, accessible, affordable, acceptable, transparent, and viable mode of execution for the generations of today and tomorrow (WCED, 1987).

The benchmarks or characteristics of sustainability are reflected in three essential quality quotients that address how efficiently a project becomes environmentally friendly, socially equitable, and economically viable. This means, first, that MACFAST learns about and promotes items that cause minimal environmental harm, assesses its carbon footprint and acts to lessen it, and supports others who work and live in eco-friendly ways and do research on sustainability. Second, sustainability at MACFAST also advocates for social equity and equality. Finally, sustainability depends mainly on the economic viability of the whole endeavor. The ability of the entity to continue achieving its operating objectives while avoiding the wasteful consumption of material resources and promoting a positive impact on society and the environment is fundamental. Moreover, the economic viability of a project actualizes its potential all the more only when it is in an “innovation mode” of sustainability.

In short, MACFAST and its educational endeavors work toward a fully conscious and ecologically sustainable world where accountability, responsibility, and transparency remain to be the core values and vision of an inclusive society. The new education system should bring up a new generation that believes in a sustainable society and practices an eco-friendly lifestyle. Any business and entrepreneurial venture in the upcoming era, therefore, should proactively look for sustainability.

MACFAST is thus envisioned not only in accordance with the characteristics of sustainability mentioned above but also through the model of action and reflection or *praxis*. Praxis, which may be described as a form of critical thinking that combines reflection and action (Freire, 1970), can be viewed as a progression of the following cognitive and physical acts:

- taking action;
- considering the impacts of the action;
- analyzing the results of the action by reflecting upon them;
- altering and revising concepts and planning after reflection; and
- implementing these plans in subsequent actions.

This creates a cycle which can then be viewed in terms of educational settings, learners, and educational facilitators.

MACFASTian praxis supports the “see, judge, and act” methodology introduced by Joseph Cardijn (Australian Catholic Social Justice Council, 2011) and used in the papal encyclical *Mater et Magistra* (John XXIII, 1961: #236) where we first observe issues, situations, events, and structures then try to analyze and evaluate them with the help of available resources, solutions, and ideological foundations before finally taking action for innovation and to be relevant in the face of changing social realities. In other words, this method helps us stop, step back from a situation, and reflect on it before we jump in and take action.

The usage of MACFAST praxis methodology is evident in various projects. For example, the school initially availed of 30 kW of solar energy to address its recurring issue of electricity failures and voltage shortages; today, the entire college is now flooded with 130 kW of solar power, making MACFAST the first fully solar powered and energy self-sufficient education institution in India. MACFAST also started the Clean and Green Campus project, an awareness-action-research program that was later extended as a campaign for the town. Clean and Green Tiruvalla eventually led to the town garnering an award for being the best municipality in the state.

MACFAST MODELS OF INNOVATION FOR SUSTAINABILITY

In the Beginning: Go-Green

The college was established on five acres and 11 cents of land (about 2.068 hectares) and first occupied a building that had laid abandoned and unfinished for about seven years.¹ The courtyard fronting the college was barren and completely

¹The Diocese of Tiruvalla in Kerala, India had bought the land at first and started building an affordable home for the elderly named Bethesda which was eventually discontinued.

covered with hard red granite, which reflected heat during the day and increased ambient temperatures. Upon its founding, MACFAST thus prioritized the creation of a lawn in front of the college. This was prompted by growing reflections from all over the world related to environmental issues, distressing global warming due to CO₂ emissions, human responsibility toward greening the Earth, and concerns about the overexploitation of the Earth's resources in the name of development. The sustainable development model of TBL prompted the MACFASTian praxis to prioritize the students and community at large and educate them about how to use the planet's resources effectively and responsibly because all these were created for future generations as well.

MACFAST eventually started planting flowering and fruit trees as well as a medicinal garden, which now has about 300 varieties of plants. Thus, where once only the crows and egrets that found their provisions from the nearby slaughterhouse were attracted to this piece of earth, hundreds of birds and butterflies now flock to the campus during the early morning and evening hours as they have enough to eat and ample trees in which to nest (see Figure 2). This resulted in the publication of "Birds in and around MACFAST Campus" in the *International Journal of Zoology and Research* (Nishad & Greeshma, 2017). *eBird*, the world's largest biodiversity citizen science project database managed by the Cornell Lab of Ornithology to promote science, conservation, and education, has also archived the birds of MACFAST (Nishad & Greeshma, 2017).

The Clean and Green Campus Project

The arrival of students on campus revealed many issues: a water and power shortage, the need for effective waste management, etc. The existing building, for instance, which was originally made to be a home for the elderly, had enough facilities for only a few residents. Toilet tanks thus filled up and began to overflow during the first monsoon after the students arrived. Cleaners were called in to address the issue, and during cleaning and waste disposal contract discussions, the leader of the septic tank cleaners team was asked, out of curiosity, "Where do you dump this toilet waste?" Based on their response and an understanding of their social background, it was concluded that they had neither a recycling facility nor the capability to dispose of this waste properly on their own land. There was even a shocking revelation that they used to dump the bio-waste into the nearby river after completing their work in the past.



Figure 2: Different Bird Species on the MACFAST Campus

The urgent need to find an effective solution to waste disposal was thus communicated to all the students and faculty. A campaign was organized to conscientize people about the damage resulting from ineffective waste disposal and its impact on the health of individuals and societies. With the objective to “make a model campus that is waste-free, green, clean, and healthy” (RADIO MACFAST 90.4, 2011), the college subsequently began the Clean and Green Campus project which focuses on solid waste management, campus greening, the management of landscape and aesthetics, energy conservation and management, water conservation and water quality control, sound and air quality control, and the management of the social, ethical, and cultural environment (Figure 3).

Students also began participating in the Green Hour to discuss environmental issues and subjects. Conducted every Thursday, the sessions were broken down as follows: 20 minutes for a keynote message, 20 minutes for coming up with new plans, 10 minutes for discussing common issues of the college, and 10 minutes for a review of actions taken (see Figure 4).

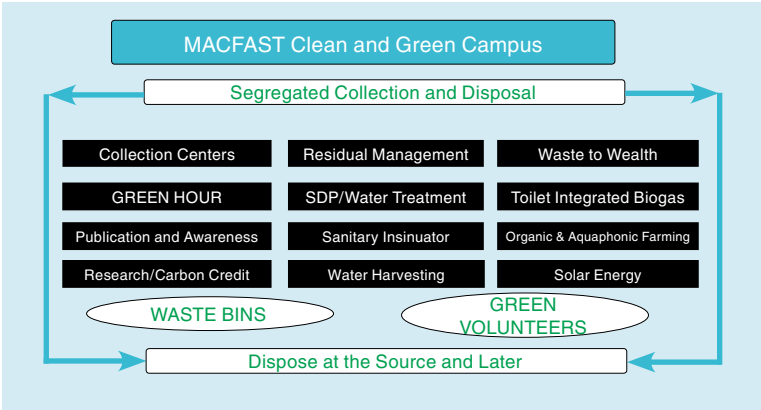


Figure 3: The MACFAST Clean and Green Campus Project Segregation Scheme

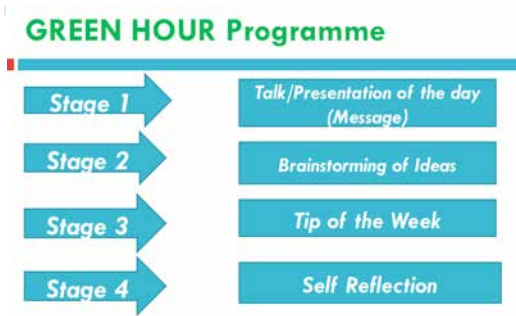


Figure 4: The Green Hour Programme

Bio-waste Integrated Biogas Plants

As part of the Go-Green praxis, MACFAST installed and began operating a 30-cubic meter biogas plant within the campus in 2007 (see Figure 5) that channelled waste from the kitchen and biowaste from the student hostels (see Figure 6). A study of the Bureau of Energy Efficiency conducted in 2015 calculated and reported that the plant generated 12,600 m² of biogas annually, equivalent to 5,250 kg of LPG (Bureau of Energy Efficiency, 2015). MACFAST had thus saved 36,750 kg of LPG at that point. About 90% of cooking in MACFAST is now done using biogas, with LPG used for the remaining 10% because of the high temperatures needed for certain types of dishes.



Figure 5: MACFAST Biogas Plant

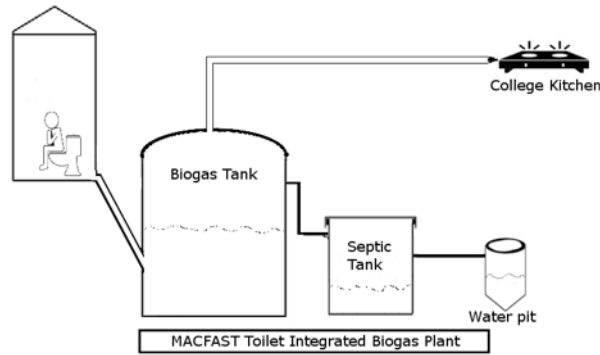


Figure 6: MACFAST Waste-to-Biogas Scheme

Clean and Green City-Tiruvalla

After acquiring enough experience and confidence, MACFAST began developing a project for the Tiruvalla Municipality in 2010 (The Hindu, 2010), where solid waste management was a big issue. After several deliberations, the project was formulated as a participatory model to develop community awareness around waste management at the source.

The decentralised model was well accepted because of land scarcity in the town and the unwillingness of residents to allow the setting up of a municipal waste-processing unit nearby. The project also proposed a slogan for awareness that sought a paradigm shift in the attitude of the community—from “Not In My Backyard” (NIMBY) syndrome to “In My Backyard” (IMBY) habit (see Figure 7). Its core theme was to enable the community to “segregate and dispose of the waste at the source

itself” (RADIO MACFAST 90.4, 2011). Creative and effective awareness, systematic implementation, and enhanced community support were recognized as the real ways to solve the waste problem.



Figure 7: Schema for the IMBY Habit

The plan to segregate at the source was conducted using a different colored bin each for bio, plastic, medical, and toxic waste. Segregation was done at the point of generation. Degradable waste was disposed of on the site itself, plastic wastes were collected daily/weekly and shifted to the plastic shredder plant, and toxic and medical wastes were treated or processed, keeping their disposal to a minimum. Size- and site-specific technologies were implemented, collection and transfer or transport to the common processing facility for recycling and reuse was well managed, and the possibility of turning waste to “wealth” helped develop biogas plants and pipe compost for houses, craft recycled products for handicrafts, and make plastic roads and tiles. Residual management thus became a new way of thinking. Waste was no longer a nuisance but a resource to be managed, thereby promoting 6Rs: Reduce, Reuse, Recycle, Refuse, Repair, and Rethink.

Rainwater Harvesting & Water Treatment Plant

MACFAST made a rainwater harvesting system that not only collects water from the building rooftops during the rainy season but also refills the pond. Water for drinking purposes is treated through the water purifier and tested periodically. The college also installed a sewage treatment plant that treats the water generated during washing for use in watering the garden (see Figure 8).



Figure 8: Wastewater Treatment Plant and Rainwater Harvesting

Solar Powered Education Institution

MACFAST had always sought since its inception to use solar energy, a renewable source of power that is non-polluting and available in plenty, to meet its electricity requirements. Installing a solar energy system, however, is quite expensive, yet MACFAST eventually realized that the need for it was paramount due to voltage fluctuations, constant power shut downs, and the de-energization of the local grid during class times for maintenance and repair. Indeed, grid energy failures reduce the effectiveness of faculty and students and affect the resourcefulness of the community.

Fortunately, the government (through MNRE/ANERT) launched a subsidy scheme which made the return on investment for solar power attractive. MACFAST thus established its 30kW solar installation in November 2011, the highest capacity available at that time, and has added 100kw since. It is a tangible investment that also ensures several intangible returns. According to the *Baseline Energy Audit Report* (Bureau of Energy Efficiency, 2015), the solar power plant generates a daily average of 96 kW of electricity.

In its mitigating greenhouse gases through its energy efficiency improvements in lighting systems and awareness program, MACFAST is also eligible for carbon credits. Indeed, the solar power and biogas plants together have mitigated 523 tons of CO₂ since their installation (Bureau of Energy Efficiency, 2015).

Community Radio MACFAST 90.4: The Community's Companion

MACFAST became a trendsetter with the introduction of Radio MACFAST 90.4 in 2009, the first campus-based community radio station in the country which is also unique in the community radio segment due to its wide range of diverse and interesting programs that air 18 hours per day. Rooted in its founding philosophy of giving a voice to the voiceless, it acts as a center for religious, social, cultural, and national integration, thereby coordinating knowledge from a variety of sources. It reaches around 500,000 listeners through a multitude of programs that not only entertain but also share knowledge, and strives to achieve exactly what its slogan says— “Nattukarku Koottayi” (Community's Companion)—by being “a partner friend in all the endeavors of the local populace” (MACFAST, n.d.b). It closely serves its audience through its reflection of vital community issues, focusing specifically on the community's needs and encouraging people by conducting various seminars, exhibitions, road shows, and competitions. Radio MACFAST ultimately believes that the emergence of a knowledge society is possible through focused work at the grassroots level and that transfer of knowledge happens in both directions—from urban society to the rural and vice versa. The station, moreover, has become one of the main sources of economic sustainability for MACFAST.

CONCLUSION

Seven innovations from MACFAST education, which is based on the Quintuple Bottom Line, are described above as praxis models that reflect the triple bottom line (TBL) as well as the purpose for life and the passion for study. MACFAST education reiterates what Pope Francis says in *Laudato Si'* about “our common origin, of our mutual belonging, and of a future to be shared with everyone” (Francis, 2015: #202) and about good education that “plants seeds when we are young, and [that] these continue to bear fruit throughout life” (Francis, 2015: #213). MACFAST also draws inspiration from both Mahatma Gandhi's thought that “there is sufficiency in the world for man's need but not for his greed” and the wisdom of Proverbs 29:18: “when vision vanishes, people perish.” MACFAST innovations thus continue to reinterpret its vision and reinforce its reputation as a trendsetter in education, innovation, and sustainability.

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