

DEVELOPING COUNTRIES CORNER

SOLUTIONS FOR LITTERING IN THE UNIVERSITIES: THE GREEN WATCHMAN

Even if the perception of waste is more developed in the industrialised countries, this does not mean that the phenomenon of abandoned waste is less present. Respect for public or private places for public use reflects the sense of civic duty: in particular the personal management of their own waste produced in a shared space, is an evident sign of the awareness of one's own ecological footprint and of the citizen's ability to feel part of a whole.

Unfortunately there are increasing instances of waste discarded into the environment, and these include household waste, bulky waste, and even hazardous waste, such as building demolition waste, but at times also dangerous industrial waste.

This phenomenon, generally known as illegal waste dumping when significant quantities are involved, is instead called "littering" when it involves the habit of throwing small waste wherever, such as wastepaper, chewing gum, and cigarette ends. This trend has intensified with the rise of new eating habits that increase the use of single-use packaging, paper napkins, drinking straws, bottles, cans which, if not correctly disposed of in the appropriate waste bins, can soil public spaces. It is estimated that, particularly in the industrialised countries, over half of waste abandonment should be viewed in relation with the increasing tendency to eat quick meals away from home.

The problems caused by abandonment are hygienic and sanitary, as well as environmental, and evidently economic as well. The costs to retrieve abandoned refuse or to clean up inappropriate disposals should, in fact, be added to those of regular waste management, and burden on the community. To this it should also be added the damage engendered by the aesthetic degradation of land in general.

To counteract this phenomenon, the most sensitive states for over thirty years have put in place dedicated initiatives in the form of advertising campaigns directed toward citizens, or initiatives for area clean-ups; but there are also initiatives that can be put in place that take advantage of new technologies to monitor the phenomenon and allow the stakeholders (Towns, Provinces, Regions, Law Enforcement, Competent Territorial Authorities, etc.) to act in a more coordinated manner, exploiting the increasingly scarce resources available (Ghiringhelli, 2012).

Every day our universities host a large number of individuals: teachers, students, collaborators, etc. These people, spending a lot of time away from home, inevitably produce waste that becomes an easy object of abandonment. For these reasons and because they are areas of significant

size but at the same time limited, some universities implemented surveys and education program on littering. Several studies demonstrated how environmental education is generally followed by responsible actions (Hungerford and Volk, 1990; Zeleny, 1999) and thus it can effectively improve environmental awareness.

Two universities' case studies are presented to compare the effectiveness of actions taken in an industrialized country (Italy) with those in a developing country (Bangladesh).

The two universities, the LIUC - University Carlo Cattaneo in Castellanza (Italy) and the KUET - Khulna University of Engineering & Technology in Bangladesh, adopted different initiatives to analyse the phenomena and implemented different solutions to solve the problem, taking care of the different awareness and social/economic organisation.

LIUC-University Carlo Cattaneo, Castellanza, Italy

LIUC is conceived in 1989, from the convergent will of 300 entrepreneurs to create a university with an economic-technical-juridical-scientific-managerial direction that prepares young people according to the real needs of the world of work. LIUC represents the only Italian university founded and directly managed by an entrepreneurial association. Today around 2000 students and 300 professors work in the university, so far about 9000 graduated.

The covered area of the University is 68000 square meters, with classrooms for 3000 seats, a lecture hall with more than 300 seats, 5 laboratories, a library of 1600 square meters. LIUC Campus also has a university residence of 440 industrial beds and a total area of 10800 square metres that allows hosting foreign students. LIUC is part of the RUS - network of the universities for sustainability - promoted by the CRUI (Conference of the Rectors of Italian Universities), the first experience of coordination and sharing among all Italian universities engaged on the issues of environmental sustainability and social responsibility. The research here presented is part of the activities promoted under the RUS.

The following steps have been implemented: questionnaire on the perception of waste management; characterisation of littering using EPA methodology (Environmental Protection Agency USA); proposal of interventions for the mitigation of the phenomenon; implementation of some interventions and verification of their effectiveness. An electronic questionnaire was prepared and administered to the various identified stakeholders (professors, non-teaching staff and students) to gather information on their habits and their degree of satisfaction with waste management in the university.

Most critical areas were identified and participants recognised cigarette butts, chewing gum, containers and slips of paper, plastic bottles and glasses, both in the open areas (yards and parks) and in the classes, as the most common waste found in the university. Among these, cigarettes and chewing gums occupy the first places for “degree of discomfort”.

In addition to an inadequate number of containers for separate collection and their wrong placement, the results showed that education, involvement and enforcement are the three parameters on which to focus in order to obtain a significant margin of improvement in the struggle to littering.

Considering the education among the most deficient elements, the littering prevention initiative test was carried out through a targeted awareness campaign, which involved in an experimental basis teachers and students of some classes. The former, at the end of each lesson, projected slides specially created to remind not to leave or throw anything on the floor or on the desks. After a monitoring of about a month, which provided for the verification of the abandonment of waste before and after the campaign with the number of abandoned objects, there was a sharp decline in the latter, showing a direct correlation between education interventions and the reduction of the littering phenomenon.

KUET-Khulna University of Engineering & Technology

Khulna University of Engineering & Technology (KUET) is one of the leading public universities of Bangladesh giving special emphasis in the Engineering and Technological Education and research. KUET is well known for offering very high quality educational, research and developmental programs in the major disciplines of engineering as well as basic sciences. It has a sober objective to achieve excellence in quality education, research and progression to address the present needs of the country.

At present, around 6200 students are studying in KUET in 20 Academic Department under 3 Faculties.

The campus of this university is spreading over an area of around 409000 square meters. The Physical infrastructure includes Halls of residence, Academic Buildings and Institutes, Workshops, Library, Computer Center, Play grounds, Cafeteria, Auditorium, Medical Center, Bank, Post Office, ATM Booth, Guest House and Club, Mosque, Dormitory, Teachers & Staff quarters, Schools etc. In every year, about 800 students graduate from this university at different branches of engineering and technology.

Population growth, urbanization and industrialization are the factors for the increasing rate of solid waste production in Bangladesh. The per capita waste generation is about 400 g/day but the solid waste management system is not well implemented due to limited finances and organizational capacity. Moreover the perception of people on pollution and waste impacts is quite low as in the most of the developing countries (Lavagnolo, 2019).

In this framework, the University implemented a solid waste collection to properly manage the waste production in the campus. However, despite the placement of ‘waste bins’ in the proper locations and timely collected, awareness campaign, warning notice against littering and intro-

duction of penalty, the waste littering could not be stopped.

In the year of 2013, a simple campus-wise waste management was designed by prof. Muhammed Alamgir - at that time Vice-Chancellor of KUET - with the support from the university authority. In these footsteps, the Green Watchman concept was introduced from the month of November 2013.

As a Green Watchman, university authority engaged one of its smart employees from the Security Section who inspects the entire campus every day during office hour from 9:00 to 17:00 riding a bicycle wearing special dress (Figure 1). The dress consists of white-coloured shoes, pants, shirt, hat and a half-slip green apron. In the back of the apron “Green Watchman” is printed in white.

On the bicycle, there are two small bins attached in the back with the carrier on the rear wheel. Moreover, two placards “Store wastes in a designated container to make clean KUET” are attached in the front and back of the bicycle. Every day, he works with a strong commitment and passes through all the internal roads in the campus. He collects the littered wastes, advises the people softly and requests them not to litter as it tarnishes the image of the campus and also it is not the act of a smart person. The activities of Green Watchman have drawn huge attention from all people living and/or visiting in the campus. As expected, the model works out successfully.

Presently, littering of wastes in KUET campus almost stopped and it became the most clean and green university campus of Bangladesh.

Conclusions

In addition to taking on social responsibilities by helping to promote a sense of civic duty among their students, fighting littering means for universities to contribute to a much wider project: sustainability. Universities represent



FIGURE 1: The Green Watchman at the KUET, Bangladesh (courtesy of prof. M. Alamgir).

a key element for the development of sustainability concepts.

The main interventions adopted today are related to:

- information and awareness-raising (by encouraging research theses on the topic and disseminating news and promoting internal activities to combat littering);
- infrastructure changes (increasing the number of bins in the most frequented areas, especially ashtrays and differentiated for plastic and paper);
- involvement (organising “ideas competitions” between students on the topic);
- small gadgets (such as portable ashtrays or reusable cups for drinks);
- the Green Watchman, to discourage littering and promote the awareness on pollution.

A solid and continuous education of young people, an empowerment aimed at the awareness of environmental

issues, a combination of innovation and sustainability are the necessary conditions for a real improvement.

G. Ghiringhelli ¹, M. Alamgir ² and M.C. Lavagnolo ^{3*}

¹ *LIUC - Università Cattaneo (Italy)*

² *KUET - Khulna University of Engineering & Technology (Bangladesh)*

³ *University of Padova (Italy)*

*email: mariacristina.lavagnolo@unipd.it

REFERENCES

- G. Ghiringhelli (2012). L'abbandono di rifiuti e il littering: strumenti per conoscere il fenomeno e contrastarlo, Edizioni Ambiente, ISBN: 978-88-6627-091-1
- H.R. Hungerford & T.L. Volk (1990). Changing Learner Behavior Through Environmental Education. *The Journal of Environmental Education*, 1, 8-21. doi.org/10.1080/00958964.1990.10753743
- M.C. Lavagnolo & V. Grossule, 2019. From 3R to 3S: an appropriate strategy for developing countries. *Detritus Journal*, 4, 1-3
- Environment Protection Authority (2013). NSW Litter Prevention Kit-The Local Litter Check. ISBN 978-1-76039-414-1