

AN ECONOMIC, SOCIAL & ENVIRONMENTAL REVIEW OF EFFLUENT DISPOSAL USING TBL PRINCIPLES

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Abstract

Controversy surrounds the use of rural lands from which future residential and environmental needs will be met. While planners and conservationists debate how the remainder of society are to live in the 21st century, surveyors continue to subdivide the lands according to historical cadastral boundaries leaving developers and landowners to resolve long-term resource use conflicts – effluent disposal being one of the major sources of resource use conflict at both individual lot development and centralised sewerage schemes.

Within the historical perspective the New South Wales [NSW] government enacted the Environmental Planning and Assessment Act [EPAA1979] requiring developers to review and report on the social, economic and environmental ramifications of the proposed development. The extent of reporting and the requirement to consider environmentally sustainable development [ESC] are contained in s5(a)[i-viii].

Triple Bottom Line [TBL] Reporting and Accounting has been developed to provide a globally applicable sustainability reporting ‘... guidelines on the economic, environmental, and social dimensions of activities, products and services’ of trading corporations [government and non-government]. Unfortunately government does not readily adopt this premise particularly where planning policies are dependent on command and control planning [CAC] instruments as a mechanism to offset litigation risks. It is argued in this paper that ecological sustainable development [ESD] will not be adopted by either the bureaucracy or developers solely on the basis of good science as projects also require good economics. Effluent disposal is used to illustrate the need for TBL to be applied in a holistic and integrated format in order to encourage ESD principles to be enacted upon.

Keywords

Rural Subdivision; Triple Bottom Line Reporting and Accounting; TBL; Ecological Economics; Effluent; Ecological Sustainable Development; ESD; Economic Viability

1 Introduction

Since the introduction of the EPAA1979 the bureaucrats responsible for the administration of the state’s planning instruments and development approvals have determined the social, economic and environmental values as an integral part of the decision making process. These valuations have been assigned without a formal derivation or comparison process. In most instances the LEC, the jurisdiction responsible for interpreting the State’s environmental legislation, have supported the bureaucrats’ valuations. So little regard has been attributed to economic valuation techniques that some LEC judges refused to hear economic argument [e.g. McNamara -v- Parry Shire Council and Rafalo, 1988].

TBL was a development of the Coalition for Environmentally Responsible Economies [CERES] in 1997 that encouraged governments internationally to become involved in developing a holistic valuation system [Global Reporting Initiative, 2000]. Internationally this has been an important response by governments to some 50 years of persistent efforts by ecological economists to have the planning process formally integrate economic, social and environmental values.

TBL has been developed to provide a globally applicable sustainability reporting ‘... guidelines on the economic, environmental, and social dimensions of activities, products and services’ of trading corporations [government and non-government]. However the TBL’s orderly and consistent information format are applicable as an evaluation tool for proposed developments. Superficially, there appears to be a paradox between the overriding policy of government as expressed in the EPAA(1979) and the plethora of environmental legislation of the past decade.

2 Comparison of EPAA1979 and TBL

Prima facie both the Environmental Planning and Assessment Act 1979 [EPAA1979] and TBL share the same common objectives of encouraging the proper management, development and conservation of natural and artificial resources, by evaluating social, economic and environmental outcomes. In application, however, there are important differences between EPAA1979 and TBL, two of the more significant being [a] the EPAA1979 *ex anti* promotes the broad community ‘macro-analysis’ of the social and economic welfare of the community and a ‘better environment’ through the co-ordination of the orderly and economic use and/or development of land and, *inter alia*, ecologically sustainable development [ESD] and [b] TBL is an *ex post* [after the event] evaluation of the ESD performance and progress of a corporate body in accordance with well-established, widely accepted external micro-reporting [e.g. firm based] principles, applied consistently from the theoretical premises of economic, social and environmental doctrines.

Major differences occur between EPAA1979 and TBL evaluation process relates to how the natural environment impacts impinge on social factors values such as health, quality of life, standard of living, because the:

- EPAA1979 predominately considers the broader macro-economic implications such as vehicle movements, noise, housing density, urban development, etc;
- TBL considers the firm-based micro-economic implications of workplace health and safety, employee retention, labour rights, human rights, and wages and working conditions at outsourced operations and other similar criteria.

Profound differences exist between EPAA1979 and TBL in the evaluation and application of economic data. Currently EPAA1979 is void of any process to apply economic values to social and environmental impacts whether they are direct or indirect. It has been noted that in some instances the economic aspects of a development are ignored in the decision process. To illustrate, it is traditionally assumed that the project is economically viable else the developer would not proceed without consideration to two basic issues:

- the consent authority does need to consider the economic impact of the development on other activities unless those activities are within a central business district [CBD];
- or
- any environmental consequences if the proposed development fails either during construction or at a time of high environmental impact [e.g. the open-cut mine at Temora]

Indirectly TBL considers the implication of the business' activity in relation to its own economic viability. However, possibly the most significant economic valuation is the need for companies to protect themselves from risk arising from litigation for injury or other forms of adversity to either workers [e.g. Worker Compensation] or members of the wider community [e.g. Third Party Insurance].

Within the government context, litigation risk is probably the one most important single factor that results in the bureaucracy invoking CAC planning instruments – that is, government carries its own insurance by imposing controls on a range of potentially hazardous activities, including effluent disposal.

The remainder of this paper reviews the contention that government policy focuses on 'solving the problem' syndrome rather than establishing long-term ESD. In economic terms the intergenerational value of 'a better environment' is discounted to an extent in that its current value is less than having to deal with potential damages arising from.

3 The Centralised System – From cans to pans

City and urban centres have graduated from 'night soil pans' to ceramic pans attached to a reticulated sewerage system. In most instances there is community consensus for this type of metropolitan effluent removal and treatment. Underpinning this system is centralised planning – ie a system in which central government determine the quality to which the effluent will be treated produced and the location of the discharge. Most of the population are normally oblivious to the removal and treatment of effluent once the flush button is activated.

A major consideration in the determination of the type of treatment and disposal of effluent is the degree of risk associated with the end product. Accordingly, the safeguarding of public health has historically taken precedence over ESD considerations. In terms of TBL the costs attributed to damage to the environment through ocean outfall, its social implications [e.g. tourism], and operating costs would all be outweighed by the potential financial burdens arising from legal damages should an injury or major health crisis occur. For example, when raw sewage in the surf off the Sydney beaches was identified as a health risk in the late 1980s there was an immediate inquiry and an action plan implemented. Until that time there was a consensus that the salt water destroyed harmful bacteria with the social and economic impact of the contaminated surf discounted by the health and planning authorities.

In economic terms any costs [whether 'direct', 'indirect', 'priced' or 'unpriced'] were externalities – that is the 'cost' associated with the discomfort of surfing with faecal matter was absorbed by the 'third parties' who selected that location for their recreation activities. It was only when the potential litigation was realised that corrective action was taken ... and then in the name of the environment to avoid any admission of liability.

To enable government to avoid any suggestion of liability the bureaucracy created a situation of asymmetric information that is a situation where stakeholders had different information upon which to make their decisions. In this instance the government had more information regarding the health risks of faecal material in salt water but contained the public awareness to 'environmental issues' such as water quality and impacts on marine life.

In recent years the government has been confronted with the dilemma that improved education and community awareness of technical information via the print, electronic and digital media there has been a major narrowing of the magnitude of asymmetry. These actions has not resulted in an increase of community demands for ESD, but broadened the scope and coverage of CAC legislation to reduce the extent of liability litigation that can be brought against the government or its agencies.

For example the Local Government (Approvals) Amendment (Sewage Management) Regulations 1998 was a direct response to the Wallis Lakes contamination. Applying asymmetry of information the Government is currently inferring that septic tanks require increased CAC regulation, resulting in part to some tourism operators being 'encouraged' to outlay large expenditures to connect to a centralised sewage treatment system. It is noted also that in some instances the government does not have to conform to its own legislation, arguing that their actions are in the public interest – e.g. National Parks and Wildlife Service (NPWS) is immune to the Local Government (Approvals) Amendment (Sewage Management) Regulations 1998, but no other exemptions apply to the general community.

A more recent government development has been the introduction of the economic incentive emanating from Load Based Licensing [LBL] for authorities with centralised effluent systems to apply recycling methods. With the introduction of LBL in NSW most local government authorities are minimising the extent of effluent entering the open ecosystem by using a variety of means including artificial wetlands, large-scale irrigation of pasture areas and watering of sporting ovals. In effect LBL is bringing to account, if albeit partially, the externalities originally associated with effluent disposal.

4 LBL: Affluence –v- Effluent

A more recent NSW government initiative of LBL provides regulators of centralised wastewater systems the financial incentive to discharge effluent on land rather than in rivers and streams. Most local government authorities are minimising the volume of effluent entering the open ecosystem by using a variety of means including artificial wetlands, large-scale irrigation of pasture areas and watering of sporting ovals. From a macro-economic perspective there are concepts that need to be reviewed and evaluated in context of LBL including [a] the determination of the economic efficiency, [b] estimation of the taxation efficiency and [c] the evaluation of the ability-to-pay principle.

It has been noted that LBL is an equality-based [not equity as incorrectly stated in the government's policy statements] polluters-pay taxation commensurate to the level of pollution discharged from a sewage treatment works. Historically state governments allocated to rural locations sewage treatment works of lower efficiency than those installed in the cities and larger metropolitan centres. There is considerable statistical evidence from the Australian Bureau of Statistics [ABS] that the rural areas are socially and economically disadvantaged compared to their city cousins. From these data it can be concluded that the rural population are paying disproportionately higher LBL charges in terms of income.

Instinctively, LBL should encourage revised disposal practices that assist in observing ESD and therefore could increase the TBL ratings; currently the converse is occurring in most instances as illustrated by the fact that Sydney, the city that could most afford LBL charges, discharges its effluent to the Tasman Sea and does not incur LBL costs of pollutant loads that apply to less affluent rural areas.

Further economic examination of LBL reveals that that all the changes to the disposal of centralised effluent have been enacted through CAC procedures to impose a pollutant-load based tax and not ESD principles. The LBL tax is not a true 'user-pays tax' as posited by government as the community could not exercise their consumer sovereignty – that is to say, by removing the community from the decision making process, the government has removed the means to measure the elasticity of demand - the percentage change in the quantity demanded divided by the percentage change in price. In short, the community has not been able to exercise their right to express the extent of treatment that should be applied to the effluent from their area. It is possible that the community could be willing to pay more than the current rate to achieve a higher quality product than that currently being achieved. The

converse is also a probability. Either way, rural communities have the choice of paying a rural based tax, pay additional moneys for land based disposal, or some combination of both, rather than contributing to ESD practices.

It can be suggested that current centralised effluent systems, whilst the most efficient means of minimising potential costs arising from litigation risk, are economically inefficient in the allocation and use of both input and output resources. It can be confidently forecast that a TBL analysis would result in a low ESD rating determined on each of the three social, economic and environmental criteria.

5 From the Pits to Septics

Dichotomous to centralised effluent systems are a variety of on-site [soil absorption] systems [OSS] ranging from drop pits, composting toilets, variety of septic tank and aerated systems. A principal difference between centralised systems and OSS is that disposal is contained to the landowner's property, as distinct to public lands, waterways or ocean outfalls. If we lived in an ideal world [as determined by economists] and property rights were properly enacted whereby landowners would be forced to pay for any negative externalities they impose on others, than the associated market transactions would produce efficient outcomes such as those espoused in Coase's Theorem [Coase, 1960].

Context	Owner of the Property Rights	Direction of Transaction	
		Community	Landowner
Free Market (Coase)	Community	Receives Payment	Makes Payment
	Landowner	Makes Payment	Receives Payment
Government Intervention	Community	Receive Payment (Crown)	Makes Payment
	Landowner	Societal PR Claims Fulfilled	Makes Payment

Figure 1: Economic impact of removing property through imposition of legislative restrictions. [Source: Brennan 2001]

Underpinning Coase's conjectures is the principle that land owners possess full property rights, creating circumstances so landowners can allocate resources to trade-off any potential charges. Potential charges confronting landowners with full property rights include clean-up expenses [treatment, remediation, or destruction of contaminated material] and on-going third party injury insurance fees against the

construction and maintenance of a higher-grade OSS effluent treatment system.

As illustrated in Figure 1, these circumstances do not exist as consumer sovereignty has been removed with the introduction of the state regulation, including the necessity for construction approvals and more recently regular governments inspections.

In simplistic terms the outlined section of Figure 1 [bottom right] illustrates that CAC removes the 'trade-off' option placing all financial burdens onto the landowner, while the community, through the bureaucracy, enjoys minimisation of risk exposure – commonly referred to as 'free riders'.

6 All-at-Sea on Wallis Lakes

It can be argued that the Government's demand to exert its control has intensified in NSW since the public concern and subsequent litigation following the Wallis Lakes contamination [Ryan –v- Great Lakes Shire Council, 1999]. Central to the Wallis Lake case was an assessment of the government's duty of care in the event of failures, e.g. Who is responsible for preventing out-breaks of community diseases such as cholera, hepatitis, and *Cryptosporidiosis*– the government or the individuals? And what are the morals?

There are some important precedents arising from the Wallis Lake case, including the finding by the court that as the government had regulations regarding OSSs generally, they had a duty of care to supervise the provisions of their own regulation.

In economic terms these outcomes could result in two main impacts [a] a less than optimum 'allocative efficiency' from available resources due in part to the imposed landowner constraints on the use of the ecosystem to achieve ESD outcomes; and [b] higher compliance costs as OSSs not designed to achieve optimum results to particular ecosystems.

ESD and economic inefficiencies resulting from OSS regulations being based almost entirely on the physical environmental attributes such as soils, weather, climate, etc and avoid the issue of locational risk factors. Derivation of these conclusions are illustrated by the following hypothetical scenario:

An OSS near a river has a higher public health risk than an OSS located several kilometres from an environmentally sensitive area surrounded by improved pastures. If ESD policies were followed the type of system approved in each case should be based on the extent of risk of failure and the TBL costs associated with that failure. As opposed to the existing situation where both sites have the same standards of conformity, a more ESD efficient policy would encourage environmental sustainability and improved economic viability by encouraging installation of systems appropriate to the site's ecological risk.

7 CAC –v- Science

There is considerable anecdotal evidence that the physical criteria imposed do not relate to good science, but rather to deter the further introduction of ESD OSS facilities. An economic interpretation of existing OSS policy is that government is foregoing [trading-off] good science in favour of public risk management. Consequently, there are two major bureaucratic impediments for approving optimum ESD OSSs: [a] government's reliance on the landowner's commitment to correctly maintain the OSS; and [b] government's confidence in the science of site specific OSS designs.

Benefit-Cost Analysis or Environmental Evaluation System can be undertaken to allow an adequate review of the proposal. A practical application of the scientific and economic techniques posited above is the Wagga Wagga Effluent Plantation Project at Flushing Meadows. Employing a site-specific scientific OSS design the administrators of the project estimate that considerable environmental benefits of protecting soil and water resources have been achieved through treated effluent being disposed of onto forestlands. One published estimate reports that up to \$482 million of national net benefit has been achieved over a 17 years time span. Extrapolating these gains over all OSSs throughout NSW the ESD gains would be economically and socially significant.

8. Common Ground

Controversy surrounds the use of rural lands from which future residential and environmental needs will be met. While planners and conservationists debate how the remainder of society are to live in the 21st century, surveyors continue to subdivide the lands according to historical cadastral boundaries leaving developers and landowners to resolve long-term resource use conflicts – effluent disposal being one of the major sources of resource use conflict. A common element determining subdivision design is the 'planning zone' that determines the minimum size allotment that can be created by the subdivision.

While the modern era purports to require developers to review and report on the social, economic and environmental ramifications of their proposed development the subdivisional process is circumvented by the predetermination of land use zones. Convenient planning – an inefficient use of natural resources. Also circumvented is the intergovernment ESD agreement that is constrained by command and control regulations.

From the foregoing discussion it can be derived that the main deterrent to the planners and policy administrators adopting ESD within the effluent disposal industry is the government's excessive valuation of risk management compared to the values attributed to ESD outcomes. This outcome can be attributed to the fact that the government has accepted 'ownership' of the duty of care for the community's health and wellbeing. Accordingly, for ESD principles to be adopted it is necessary for the landowners to become responsible for managing the outcomes, ie return to the situation depicted in the top half of Figure 1. Currently governments deny individual landowner from accepting this responsibility, as there can be no guarantee that they will manage the system to the required standards. An alternative mechanism is for a community to accept responsibility through common or strata title, where the term is used to identify a group of persons contractually accept responsibility for their 'catchment' area or 'encroachment envelope'.

There are some examples of subdivisions installing small to medium-scale packaged sewage treatment works that are operated by a body corporate. The recent approval in the Land & Environment Court of a 52 dwelling development on land at Byron Bay (LEC 10982 of 2000) involved such an approach to corporate ownership. However, the outcome was driven by failure of the local authority to provide public sewage treatment for the population growth in the shire, and was significantly constrained by popular acceptance of treatment mechanisms than by ESD principles.

An observation from this case has been the reluctance of governments and conservation groups in their condoning of corporate ownership and operation of effluent systems within an otherwise freehold land situation. In opposing strata based OSSs two main philosophic reasons were advanced: [a] Strata developments are not necessarily ESD friendly; and [b] Strata developments can encourage higher density developments than would be otherwise the case where tradition OSSs are used.

There are several economic considerations that need to be reviewed in evaluating strata-owned effluent treatment plants. To resolve these constraints in favour of ESD evaluated by TBL, government must relinquish its monopoly on public risk management. By encouraging sound, socially acceptable and scientifically based environmental subdivisions, land resources can be allocated on a needs envelope basis rather than the current cadastral criterion that underpins most present day subdivisions.

9. Conclusions

It has been the intent of this paper to broaden the perspective of the debate on effluent treatment and disposal by presenting a broad scope and coverage of economic and social issues relating to the disparity between two important government policies – [a] the minimisation of risk to health of the community; and [b] the encouragement of ESD in the broader community. It is concluded that while ever the government monopolises the responsibility for duty of care, the only effective mechanism currently available is through legislation.

Conversely, for government to encourage OSSs to adopt ESD it must revise its CAC regulation by reinstating a higher level of property rights to allow the market to function more freely. It is self-contradictory of Government to acknowledge the need for 'demand site

management' [an attempt to reduce customers' demand for resource encouraging efficiency] yet impose CAC regulations on individual's waste management that encourage the opposite impact.

Existing government OSS policy is inconsistent with its ESD as the former fails to adequately consider in any meaningful way the associated 'damage function' [relationship indicating pollution damage relative to pollution emissions and associated monetary value of that damage] that are associated with the various methods of effluent treatment. Historical evidence suggests that CAC planning and legislative policies will have the following outcomes: [a] the likelihood of the ecological values of ESD associated with OSSs will be considered in the TBL context will be minimal; and [b] the priority for risk minimisation will continue to gain prominence on the decision-making processes.

While economists can measure, review and analyse TBL values, it is the community, particularly those residing in the urban areas, that determine the disparity between ESD and CAC value sets, particularly for their rural counterparts.

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