

Example of price based instruments report

[Technology](#), [Development](#)



Introduction

The Murray-Darling is the longest river system in Australia, covering an area of one million square kilometers and ranked fifteenth in the world in terms of the lengths. The Murray- Darling river system has long played an important role in the Australian agricultural sector as well as in providing various ecosystem services and supporting biodiversity for a vast array of plants and animals. Changes in land use, water extractions and river management in the Murray-Darling Basin have increased pressure on the Basin's water resources, leading to significant concern over water quality and the status of ecosystem health. The regulation of the exploitation of the basin resources has therefore become paramount to ensure sustainability. Of particular importance to focus on are the ecosystem services provided by the basin as some have their largest stake of hold in the country's economy, and affecting their optimum provision would mean total destabilization of the economy. A couple of alternative regulatory mechanisms are available for consideration but the optimal mechanisms remain most suitable. Climate change which on its part poses the greatest omen of uncontrollability is of paramount concern in the preservation strategies of the basin's resources and potential. The government ought to take measures that will best stabilize preservation and possibly enhancements. The need to identify mechanisms of prevention of loses of biodiversity as a result of climate change has also become chief. Market based instruments and financial mechanisms could best serve these needs.

(a)Ecosystem services offered by the basin

Among many other ecosystem services offered by the Murray-Darling Basin,

significant are: Recreation, which includes tourism and sporting activities; Food Production which entails the role of insects in pollination of agricultural crops as well as the role in soil fertility regulation; Gas Regulation, including CO₂ and oxygen circulation and the removal of harmful nitrogen compounds in the air; Biological Control precisely the control of potential agricultural pests and diseases and Maintenance of Biodiversity which basically involves habitat as well as species preservation. Particularly, the government needs to pay close attention to the above as it amounts to a great public and societal impact in the event of extreme degradation of the basin's capability to provide these services. These include food insecurity, which poses a great threat to a country's economy and GDP, local or even total extinction of certain species of flora and fauna, increased respiratory infections which ultimately leads to increased costs on medication and climate change. The overall effect is the deterioration of the economy and the whole ecosystem. This places the economy of the country at the verge of reverse to a third world nation.

(b) Effects of lack of regulation or improper regulation

If not well regulated, the basin's potential to provide these services at the efficient level is greatly compromised. To start with, the tourism industry that plays significant role in the economy of the country, will be greatly hindered. Considering the pollution of the waters and soil of the basin, reduction of the count of flora and fauna in the basin is bare, hence the resultant inefficient performance of the basin. Overexploitation of the resources especially the forest and the aquatic, precisely the fish leads to gradual decrement of the basin's potential to offer the services as expected.

Death of insects as a result of pollution of the basin amounts to the low agricultural output due to inefficient pollination, leading to low food production. Decrease of forest acreage demerits water catchment areas and the consequential drying out of the basin. In addition, the resultant occasional floods due to a destabilized land form and climate change significantly poses threat to the lives of citizens and Agriculture. Owing to the fact that biodiversity loss has a large number of drivers, strategies to curb the same are therefore complex and multifaceted. Conservationists often have ethical problems in using MBIs coupled with the difficulty in giving living creatures the right market price. As much as these two are sources of market failure, they are explanatory reasons for failing to provide the right price signal, as the price is often deemed to change with the existence of creatures. The management authorities often nullify prior given price signals to signal fresh ones, based on readjustments in the 'thought on' market prices of living creatures. Other sources of market failure originate from the facts that: the goods and services offered by biodiversity are public goods, conservation of biodiversity usually associates itself with external effects and the owe to that there exists a symmetry of feeling and information between individuals and firms, precisely those paying for the services and those executing the real work.

(c)Market based instruments (MBIs)

Both positive and negative incentives can be adopted. Positive incentives include subsidies and tax breaks on environmentally beneficial activities while negative incentives entail heavy charges, taxes and fees on environmentally harmful activities. These instruments aim at giving these

activities prices which they did not have, and individuals respond by adopting what costs them least. The overall outcome is the better use and utilization of the basin and its resources.

Quantity based instruments

These may include tradable permits that include the limiting of log woodland and the volume of pollutant to emit. Individuals and firms are limited on the extent of exploitation and trade is made on the rights to carry out the exploitation of a certain resource or carry out an exploitation activity associated with the environment or the resources in the basin.

Both the positive and the negative incentive costs (Subsidies/support taxes and fees) can be calculated on the basis of the environmental impact on a constant return margin dominating the overall repercussion of the activity to the basin. Others such as fees and charges can also be essentially calculated on the basis of the quantity or amount of service provided such as the amount of garbage collected and treated.

Consider these examples of analyzed MBIs:

Environmental taxes

These are compulsory payments to the government and are taxed on the basis that the benefits that the government gives to the firms and individuals is unproportional to the paid amount. Fees and charges paid to the government are given proportionally, considering the quantity of service provided to the fees and charge payers, for example the amount of garbage collected and treated.

Subsidies/support

These are made to stimulate the behavior of consumers as well as create new markets for environmental goods. They consist of financial assistance given to individuals, firms and governments to encourage certain activities deemed beneficial to the environment and the conservation gains of the basin's resources. Increasing the revenues of such beneficial entities also works for them. Grants and loans may overlap with subsidies, but the key difference is that subsidies are set amounts that are often distributed to firms and individuals and are made to achieve an objective.

Tradable permits

This basically involves trading of rights to use, pollute or exploit natural resources in the basin. They are made and designed to meet reduction goals in a substantial or the most possible cost effective and efficient way. Such trades include for example granting allowances to existing polluters or developers, for future pollutions and other exploitation practices. They have a substantial beneficial achievement as it offers individuals the freedom to choose the magnitude to achieve in the environmental improvement (Bräuer, 2003).

These MBIs overallly work better than other policy instruments such as the command based, because individuals adopt the options that work optimally for them. The market based Instruments give flexibility to responses concerning price signals hence encouraging investment and innovation. MBIs are cost effective therefore allowing improvements to be done and met in the most cost efficient way (Grafton, 2005). In addition, MBIs avoid some considerably impulsive negative incentives such as liabilities on conservation

measures, for example, protected species on land, that discourage firms and individuals from confidently investing in the basins resource management and control. Another advantage of MBIs over command based policies is that they mostly execute the 'polluter pays' principle therefore leaving the polluter to meet costs incurred.

Quantity based instrumental approach of the MBIs have a heavily weighed advantage in that they do not require the government to allocate them capital, as they only involve the control of resources and formulation of limitation principles, leaving the firms and individuals to meet the exploitation costs and damages. Whereas the command based policies venger into the individual's rights and freedoms discouraging investment, the MBIs encourage double gain for the individuals and the government.

These significant advantages have given MBIs a rise in attention as instruments of control as opposed to other type policies.

(d)Effects of climate change as an uncertainty to the conservation of the basin

Climate change poses a great threat to the sustainability and the future of the Murray-Darling Basin. Aspects of climate change include reduced rain quantity, floods, temperature changes among others. Agriculture which predominantly depends on rain water will be much affected by the lowering of rain amounts in the various seasons. This poses a chief catastrophe to the country's food security, the basin being one of the major food reliable sources. Temperature rise lead to the melting of the global ice that increases floods. Floods paramountly threaten crops as well as livestock, not even to

mention the pessimistic impact on the soil fertility of the soil in the basin. Climate change significantly disturbs the ecosystem in relation to the survival strain of hitherto well stable flora and fauna in coexistence (Kleijn & Sutherland, 2003). This especially affects insect's survival that plays a major role in food production, precisely in pollination. Floods hinder sporting activities and hence tourism. As though not enough, some plant species that hitherto survived best with present temperatures in the basin will not be able to cope with the rising temperatures, meaning possible local extinction. Crops also that initially did well in the basin will require adoption of new farming methods, meaning consequential increase in production costs hence discouragement to farmers and other agricultural bodies.

Reduced flora potentially reduces gas regulation, leading to the accumulation of carbon (IV) Oxide gas, among other toxic gases such as nitrogen (IV) oxide and lead compounds. These jeopardize the health hence the lives of citizens as they lead to the increase in the cases of chronic diseases and respiratory disturbances. The accumulation of these gases is potentially a causant of climate change (Instruments for Change, 2011)

(e) Financial mechanisms

Climate change as an uncertainty has the unavoidable impact on the basin's resources. Control mechanisms especially financial mechanisms would play a major role in regulating the basin's resources especially the water resource. A number of initiatives have been strategized and implemented to conserve Murray Basin. These have been accompanied with constant financial investment by the government, top-ups and other avenues of financial flow. Some of the financial instruments include among others:

Buy-back of the basin's water for environmental purposes and conservation strategies. They include cooperation with banks to invest capital in the recovery strategies made to bring back water for the environmental conservation purposes. An example is the April 2008 water recovery event which secured several water entitlements in the Victoria and the Murray Basins. This is a significant first milestone in the financial mechanism control and regulation. Secured water entitlements are a great and significant achievement (Missrie & Nelson, 2005).

Targets on the ecological assets of the basin is another major financial instrument involving the complementation of the assets, to be precise the upgrading of weir and fish ways among others.

There should also be substantial efforts to control and manage water sources at the state level. This basically will involve the protection of forests and the important catchment areas of nature, which should be the government's as well as the citizens' effort through campaigns and mobilization. The government will therefore have to invest in tree planting as well as other environmental concerns in the state level.

Adopting the high-price water trading policy would also highly help to regulate the basins water resource especially during the dry seasons (low water level periods). This will ensure efficient water utilization and minimize wastage and undue pollution.

Regulating water during low seasons will ensure sufficient availability of water for agriculture. Investment in upgrading projects will ensure throughout availability of water agriculture as well as the control of floods. The control of floods themselves will curb the possible loss of biodiversity.

However, the instruments have also their own demerits. Upgrading of weirs and fish ways is costly and will require bank loans that have high interest rates. The state level control of water catchment areas is also greatly hindered by the fact that some catchment areas extent to regions owned by citizens and therefore management and conservation efforts must entail full guaranteeing of the zones which is costly and almost impossible. The buy-back of water mechanism also poses stand-stillness to other sectors of the economy such as the processing industry and the manufacturing industry that utilize and rely on the basin's water to keep running.

The overall advantage is that, the returns from the conservation have the potential to fully meet the costs of management and preservation.

Conclusion.

MBIs have gained increase as methods of control and regulation in the recent past due to their advantages as discussed above. Their major yet insignificant drawback considering their potential output in terms of achievement is the limitation of scope as to where and when to apply them. This is because, with appropriate consideration and precise analysis of the areas and time, they can be effectively applied . The other possible limitation is the lack of knowledge in perfect examples, for instance telling where MBIs have been applied and are currently successful. Compared to the command and control instruments, MBI greatly open avenues and opportunities to integrate biodiversity conservation into markets of the economy. MBIs have another great advantage over other control instruments in that they achieve the same results with them with at least half the cost incurred when using command based or other policies. MBIs are promising approaches towards

conservation measures. This is because they are out-put based and they give much more freedom about the how to reach goals and achieve maximally under good prior consideration of factors and time spans. They are best effective where the desired goal or objective is a particular entity of the ecosystem such as a particular species of animals or plants or even a particular ecosystem function.

MBIs therefore evidently remains potential achievers in management, control and regulation especially in conjunction with some useful and effective command based instruments as well as some traditional regulations.

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