



An Australian Government Initiative



Public-Private Partnerships for Reforestation

- Potential frameworks for investment

**A report for the RIRDC/L&WA/FWPRDC
Joint Venture Agroforestry Program**

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Foreword

The question that this project set out to answer is: **are public-private partnerships (PPPs), like those being used in other sectors, an option for funding multi-purpose reforestation in Australia?**

There is a relatively long history around the world of joint public/private investment (public private partnerships) in other sectors, mainly for large infrastructure projects, with well-developed guidelines and risk sharing criteria. This project tested these PPP frameworks, for the possibility of using them to direct investment into large scale revegetation projects in Australia.

It is now accepted that revegetation is needed on a scale never before seen in Australia, to address a number of pressing needs such as mitigation of widespread salinity and conservation of biodiversity. Experience with recent natural resource management programs demonstrates that government funding alone could not finance the establishment of this magnitude of revegetation. However, it is reasonable to expect that the private sector would become a substantial investor in landscape repair projects that produce viable returns, if the policy settings are favourable. Much of the area requiring reforestation is unsuitable for intensive plantation development due to lower and more variable rainfall, but may be suitable for new forms of multi-purpose forestry. A key challenge for this form of forestry is how to direct investment into areas where it is most needed.

Innovative funding arrangements are required to support innovative forestry. The Joint Venture Agroforestry Program has a proud history of investing in innovative agroforestry systems. To complement the research on new land use options, we need robust implementation pathways that include commercialisation. Technical, commercial, institutional and financial innovations are required to accelerate the development and delivery of a diversity of large scale reforestation options.

The project found that existing financial, legal and policy mechanisms for PPPs appear suitable for major reforestation initiatives. Therefore generic PPP guidelines and precedents developed in other sectors could be used for planning and implementing multi-purpose forestry programs that deliver 'public good' objectives such as landscape repair, and private sector investment returns from timber production and carbon sequestration. Investments in large scale reforestation for catchment management purposes should be regarded as a form of infrastructure maintenance or renewal in order for them to become eligible under the Partnerships Victoria Guidelines. Long-term carbon markets are likely to be the most significant stimulus to multi-purpose reforestation due to their ability to attract regular payments which increase the internal rate of return for reforestation projects.

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This report is an addition to RIRDC's diverse range of over 1600 research publications. It forms part of our Agroforestry and Farm Forestry R&D program, which aims to integrate sustainable and productive agroforestry within Australian farming systems. The JVAP, under this program, is managed by RIRDC.

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Peter O'Brien

Managing Director

Rural Industries Research and Development Corporation

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Brendan Moran	Commercially Environmental Forestry Project, DAFF
Cathie Scott	Board Member, Goulburn Broken CMA
Christine Forster	Chair, Victoria Catchment Management Council, VicSuper Board
David Coate	Manager, Forest Worker and Contractor Assistance Program, Victorian Government
David Shelton	CSIRO Sustainable Ecosystems
Neil Byron	Commissioner, Productivity Commission
Rob Youl	Landcare Foundation Melbourne
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Abbreviations

ACF	Australian Conservation Foundation
AFFA	Agriculture, Fisheries and Forestry Australia
AFG	Australian Forest Growers
AGO	Australian Greenhouse Office
CMA	Catchment Management Authority
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFF	Department of Agriculture, Fisheries and Forestry
DELG	Department of the Environment and Local Government (Ireland)
EU ETS	European Union Emissions Trading Scheme
EMS	Environmental Management System
EVC	Ecological Vegetation Community
GAV	Greening Australia, Victoria
GBCMA	Goulburn Broken Catchment Management Authority
IP	Intellectual Property
IRR	Internal Rate of Return
JVAP	Joint Venture Agroforestry Program
MBI	Market Based Instruments
MIS	Managed Investment Schemes
MSP	Multi Stakeholder Partnership
NAP	National Action Plan for Salinity and Water Quality
NCCMA	North Central Catchment Management Authority
NDP	National Development Plan (Ireland)
NHT	National Heritage Trust
NLWRA	National Land and Water Resources Audit
NRM	Natural Resource Management
PDF	Pooled Development Fund
PFC	Private Forestry Council
PPP	Public Private Partnership
PSC	Public Sector Comparator
R&D	Research and Development
SFM	Sustainable Forest Management
SRI	Socially Responsible Investment
SSP	Strategic Service Partnership
VAFI	Victorian Association of Forest Industries
VCMC	Victorian Catchment Management Council

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Executive Summary

What the report is about

This report explores the potential of public-private partnerships (PPPs) for structuring the financing of major reforestation initiatives. Opportunities for leveraging private sector investment, and use of PPPs elsewhere in the world are documented. Recent activities in Victoria are used to consider the application of PPPs. The report outlines what has been learnt about PPP principles and processes, and gives guidelines for advancing public-private partnerships suitable for regional scale reforestation.

Who is the report targeted at?

Catchment Management Authorities, natural resource management (NRM) agencies, local, State and Federal government policy makers and forestry representatives will find this report useful in considering ways to combine public and private investment to achieve broadscale reforestation.

Background

Substantial private and public investment in NRM and revegetation is occurring in Australia, but a great deal more is required, and will be required for decades to come. Governments are already investing substantial public funds in programs intended to tackle NRM issues, and trialling market based approaches to deliver NRM. These funds are likely to remain insufficient to achieve the scale of revegetation required unless they can leverage substantial private investment. To date in Australia there has only been limited non-landholder, private sector investment in multi-purpose revegetation in the medium rainfall regions (450–700 mm per annum), so more effective approaches to leveraging private investment remain essential.

There is a strong need not only for research into new land use options, but also for robust implementation pathways that include commercialisation. Technical, commercial, institutional, policy and financing innovations are required to accelerate the development and delivery of new land use options. Improved systems and processes for negotiating and implementing investment partnerships are required if these are to support innovative reforestation that generates multiple benefits. The Joint Venture Agroforestry Program (JVAP) recognised this need in funding this project, *Designing effective public-private investment partnerships for major regional reforestation initiatives*. The project explored the potential of public-private partnerships (PPPs) for structuring the financing of major reforestation initiatives.

Aims/Objectives

This project set out to determine whether PPPs, like those being used in other sectors, are an option for funding multi-purpose reforestation in Australia. The project aimed to:

- Review what has been learnt about PPP principles and processes
- Review emerging policy and investment frameworks that are capable of integrating environmental and commercial drivers
- Develop a set of generic guidelines for use in developing public-private reforestation investment partnerships suitable for regional scale programs, and forestry investment that has a landscape repair component

Longer term aims of this project are to:

- Generate interest in multi-purpose agroforestry, landscape change and ecosystem services amongst capital markets
- Understand opportunities and constraints to the effective application of private and public sector investment in multi-purposes afforestation.
- Increase capacity for public programs to leverage private investment in reforestation.

Methods used

The project used the following methods:

1. The production of a comprehensive background paper based on a literature review.
2. The establishment and operation of a project reference committee that acted as a project “think tank”
3. Additional consultation with people involved in research and development (R&D), industry, commerce and NRM
4. An analysis of the findings of both the consultation and the literature and the preparation of this final report.

Section 1 of the report is an overview of issues and opportunities, and summarises the project findings in terms of financial and investment issues; forestry and NRM issues; and opportunities and constraints to PPPs. Section 2 briefly describes the approach and methods used in conducting the research. Section 3 tries to answer the question “Are PPPs suitable for reforestation in Australia?” This section concludes with a set of broad guidelines for advancing the development and use of PPPs. This is timely given that most Australian States are gaining greater confidence in using PPP for major infrastructure projects, and that at the time of writing (April 2005) the Commonwealth announced a major revision to its procurement and PPP policies.

Section 4 looks in more detail at the NRM and policy context and examines the potential role of multi-purpose forestry in relation to the NRM challenges. Section 5 sketches out the background and current situation in the Goulburn Broken region of northern Victoria, where the CMA and other agencies are attempting to broker joint public and private sector funding of revegetation. Section 6 documents a range of investment and business activities and several related public programs that individually are promoting increased forestry in Victoria. Section 7 attempts to summarise the extensive literature on PPPs in terms of the potential lessons for reforestation.

In other sectors, both in Australia and overseas, there has been extensive use of PPPs. This has led to the formation of successful public private partnerships for specific projects and the formalisation of processes for negotiating and implementing them. The relevance of this experience to reforestation in Australia is documented in sections 2 and 7.

Results/Key findings

There are opportunities for leveraging private sector investment, and therefore protecting catchments – natural infrastructure – more cost effectively. Achieving industry development and NRM outcomes while generating long term income for investors with patient capital is possible by establishing investment and policy frameworks which more effectively “marry” the capacities and interests of the public and private sectors. PPPs have been used around the world because they offer flexible arrangements for bringing these capacities together to implement a wide range of projects. PPPs should be considered as a potential option for major reforestation initiatives in Australia.

The project identified 23 key findings:

The potential roles and functions of PPPs

1. Existing financial, legal and policy mechanisms for PPPs appear suitable for major reforestation initiatives. Therefore generic PPP guidelines and precedents developed in other sectors could be used for planning and implementing multi-purpose forestry programs that deliver ‘public good’ objectives - such as landscape repair - and private sector investment returns from timber production and carbon sequestration.
2. Investments in large scale reforestation for catchment management purposes should be regarded as a form of infrastructure maintenance or renewal in order for them to become eligible under the existing guidelines developed by the Department of Treasury (Partnerships Victoria Guidelines).

3. Government initiatives should recognise the importance of building institutional and professional experience and familiarity with multi-purpose forestry developments and the use of PPPs to address environmental issues. Further pilots should be funded, possibly via the Market Based Instruments (MBI) program, which stimulate market interest, test the capacity of PPPs to leverage private investment for reforestation, and build institutional and professional capacity.
4. While technical and investment uncertainty are important constraints, these should not be considered the only impediment as factors such as community attitudes; property rights; fire management etc remain important considerations in the success of large scale revegetation. Credible participatory planning processes should be adopted to minimise negative community responses to landscape change.
5. Opportunities exist for governments to redirect NRM, greenhouse and forestry program funds to projects that leverage substantial private investment into multi-purpose reforestation initiatives that address NRM, greenhouse and forest industry objectives.

Technical and planning issues

6. Due to regional diversity and landscape complexity, uniform forestry or revegetation prescriptions cannot be applied. Therefore any funding of reforestation initiatives needs to have a strong design and planning focus using detailed, spatially explicit information and explicit project criteria that allows for assessment of individual projects and sites.
7. Planning and priority setting tools such as salinity mapping and biodiversity benefits are being developed that will increase access to detailed information both for the private and public sectors. Spatially explicit information obtained by such planning tools is useful to assess technical and other aspects of individual projects and sites.
8. Uncertainty in technical areas such as species growth rates, timber production, salinity, and hydrology impacts impedes the confidence of both public and private sector investors. This lack of technically rigorous information demonstrates a clear need for ongoing R&D, plus the building of public and private sector capacity in forecasting the risks and returns arising from investment in multi-purpose reforestation.

Carbon markets and their prospects

9. Long-term carbon markets are likely to be the most significant stimulus to multi-purpose reforestation due to their ability to attract regular payments which increase the internal rate of return (IRR) for reforestation projects. A carbon register should be established to facilitate and monitor trade. The current Australian Government position on the Kyoto Protocol excludes forestry projects that achieve carbon sequestration from achieving returns from this potentially large and lucrative international market. This appears to be acting as a major disincentive to large scale revegetation.
10. Carbon sequestration is the easiest of the potential ecosystem services to measure due to the global nature of the market, the standard characteristics of the commodity and the relative ease of its quantification.

Defining the roles of governments

11. Governments need to clearly state which environmental benefits they are prepared to pay for and initiate structured processes of price discovery (e.g. tendering). This would encourage businesses to actively pursue environmental benefit contracts. With experience governments would become smarter purchasers of these services, and help the private sector to make better investment decisions on the type and locations of plantations, or other changes in land use, such as sponsoring natural regeneration.
12. Despite the lack of established markets for environmental services, it is worthwhile focusing on Governments becoming smarter purchasers of these services. Government incentive payments should be focused on explicit outcomes or outputs (e.g. CO₂ sequestered, area regenerated/revegetated) rather than inputs, in order to encourage innovation and efficiency.

13. Government has a clear leadership role to play in that it has the capacity to generate private sector interest on the scale required. While in the longer term, government is likely to become a less substantial player, operating more by setting the “rules of the game” than by being the purchasers of services or the facilitator of projects, initially it has a clear and definable role in establishing market confidence in investments which address issues of national significance.
14. The federal government should consider reforestation and other environmental initiatives in its current review of PPP investment structures and tax arrangements.
15. CMAs have limited experience in commercial negotiations on the scale of envisaged forestry or land use change contracts, thus investors may be wary. Roles and responsibilities within government need to be clarified to alleviate this problem, and it is foreseeable that State Treasury may be the best placed agency to undertake financial negotiations with support from forestry and NRM agencies.

Creating a favourable investment environment

16. There is substantial and growing interest in multi-purpose forestry, landscape change and ecosystem services amongst the capital markets and the “investment community”. Multi-purpose forestry may represent a significant investment opportunity for patient capital, particularly that which wants to be tagged as “sustainability investment”. Significant investment in multi-purpose forestry could be achieved by “marrying” private and public sector investment and capacity through well-designed PPPs.
17. There is a need to link together the forecasting of carbon stocks and timber revenue to gain an overall picture of cash flow, internal rates of return and asset values over time, based on assessing different scenarios of changing global circumstances. Government should provide information to support this kind of analysis, while the private sector continues to conduct its own analysis or risks and opportunities.
18. To stimulate reforestation activity on a scale sufficient to have a measurable impact governments can help create a favourable investment environment by:
 - establishing bi-partisan political support for long-term projects focussed on multiple outcomes (This will help overcome the problems that can arise during negotiations with different levels of government.);
 - clarifying the roles of Government agencies;
 - focusing policies and programs on engendering sufficient confidence of landholders and investors in long-term environmental services contracts or equivalents;
 - modelling the likely scale and impacts of reforestation on a region by region basis in terms of environment, employment and economic activity e.g.: impacts on landscapes, water, future timber industry etc;
 - further R&D and provision of information on emerging forestry options;
 - supporting analysis which fosters informed investment in emerging ecosystem services markets, and explores the willingness of the market to participate.
19. Governments already spend substantial amounts of money on NRM, mainly through large numbers of relatively small grants (e.g. NHT/NAP etc). In order to achieve NRM outcomes cost effectively, strategic projects should be funded which build capacity to leverage private investment through large scale investment projects engaging the capital markets, landholders, timber companies and CMAs.

Addressing institutional constraints

20. While PPPs have been used to fund many initiatives around the world, there are no examples supporting the kind of broad scale environmental repair proposed in this report.
21. Lack of professional, governmental and institutional experience is an impediment to the potential for large-scale partnerships focused on revegetation.

22. The costs and benefits of establishing a special purpose statutory authority charged with overseeing implementation of multi-purpose reforestation should be compared with an existing authority such as Sustainability Victoria in becoming responsible for brokering deals etc.
23. In the event that there is a responsible authority or special purpose fund, project investment guidelines should be developed which are based on clear principles which permit sufficient flexibility to adapt to a range of circumstances.

Recommendations – Guidelines for advancing PPPs for reforestation

The project set out to produce a set of guidelines, which could support the development of PPPs for reforestation. The following are proposed:

1. Establish a flexible framework for PPP development

A framework for PPP development should be flexible so as to be applicable to a wide variety of projects and situations. Public investment should be based on clear principles, including public benefit tests, and individual projects should be assessed on their likely outcomes. Where possible Governments and NRM bodies should specify the outcomes that they are trying to achieve and willing to pay for as over time it is assumed that this will encourage further innovation in both financing, landscape design and reforestation techniques.

2. Explore a range of options for structuring deals

There is a need to look at a wide range of options for structuring deals. Ways of cost sharing, benefit sharing and/or risk sharing are required that bring together public and private sector investments to finance projects with clearly defined and specified objectives. An overall framework which is sufficiently flexible is required to allow for different conditions, project circumstances and risks and rates of returns etc. Negotiation arrangements are required for ensuring that the greater the risk taken by a stakeholder or investor, the greater the potential return. Risk and reward should be allocated proportionally.

3. Segment long term deals with shorter term renegotiation periods

Long-term deals can be broken into shorter “renegotiation” periods based on pre-determined time or trigger clauses. This would help reduce uncertainty for both the public and private sector, and allow for managing expectation and risk, for instance due to changing carbon prices. Good commercial contracts can provide renegotiation triggers. Triggers and timing of any renegotiation of agreements should be predetermined within contracts, by the parties involved.

4. Determine the liability for specific risks

Where there are high levels of uncertainty regarding environmental benefits - e.g. will planting a forest reduce salinity in stream x kilometres away? – Governments or NRM bodies should determine the extent to which they take the risk induced by poor knowledge of the underlying environmental processes. While uncertainty and complexity may reduce confidence governments are able to make contractual options available based on predicted rather than measured outcomes.

5. Establish a carbon register

A carbon register should be established to facilitate and monitor trade. This is a current impediment to the market, but the current proposal by the Australian States to establish a carbon market may overcome this¹.

¹ At the time of printing, the Task Group on Emissions Trading has submitted a report to the Australian Prime Minister. This includes recommendations regarding a national emissions trading scheme and carbon trading.

6. Underwrite long term contracts

If long term contracts are to be entered into, in addition to short-term grants, funding will most likely need to be underwritten by State or Commonwealth Governments, as the CMAs cannot guarantee funding over the life of an environmental forestry project – e.g. between 10 and 30 years. Other PPP contracts – such as the Spencer Street Station Redevelopment - have been entered into with a time frame of 30 years and therefore offer a precedent for long term contractual arrangements.

7. Fund learn-by-negotiation processes as well as on ground projects

Prior to the development of more mature markets, public funding is required to support “learn by negotiation” processes, in addition to on-ground projects. For example, the Commercial Environmental Forestry (CEF) project is identifying a range of constraints to cost-effective contracting that need to be streamlined (see Section 5).

8. Reduce transaction costs of dealing with multiple agencies

Transaction costs of dealing with multiple agencies and streams of State and Commonwealth Program funding need to be reduced if projects are to cost effectively address multiple NRM, greenhouse and industry development outcomes.

9. Involve all stakeholders from the outset

If multi-purpose plantations are to meet the needs of a range of parties, these parties should be involved from the outset. For example, negotiation processes need to ensure the presence of a range of prospective investors, including carbon buyers, timber companies, landholders etc to ensure that the perspective of different parts of the market are presented.

10. Establish clear negotiation processes

Negotiation processes need to clearly define the different interests and concerns of private and public stakeholders and need to result in clearly defined roles and responsibilities for all parties. Negotiation processes need to ensure that respective shares in risks are adequately determined and clearly allocated.

1. Overview and opportunities

1.1 Exploring public private partnerships

Innovative financing and funding arrangements are required to support land use change, involving innovative revegetation and forestry. By using the situation in Victoria the project explored the potential of public-private partnerships (PPPs) for structuring of major reforestation initiatives. This final report documents the findings of the work implemented in 2004.

Despite substantial private and public investment in NRM and revegetation in Australia, a great deal more is required, and will be required for decades to come. Improved systems and processes for negotiating and implementing investment partnerships are required, including those that can support innovative reforestation that generates multiple benefits. Recognition of this need led to JVAP providing funds for this project “*Designing effective public-private investment partnerships for major regional reforestation initiatives*”.

The question that this project set out to answer is: **are public-private partnerships (PPPs), like those being used in other sectors, an option for funding multi-purpose reforestation in Australia?**

We found that PPPs could offer a suitable framework for:

- Sharing costs and benefits between governments, investors, business and the environment;
- Leveraging private sector skills, capacity and capital with skilfully directed public funds.
- Generating new modes of achieving NRM outcomes and improving the cost effectiveness of NRM programs.
- Combining public and private sector knowledge, skills, land and capital in ways that could result in new, large-scale land uses.
- Turning large scale landscape change and reforestation into dynamic business opportunities, creating new asset classes.

The project investigated broadly:

- The experience of using PPPs in other sectors;
- The policy, commercial and legal aspects of PPPs;
- How to conceive of using financing arrangements like PPPs to implement regionally appropriate large scale reforestation in medium rainfall areas of Victoria;
- The opportunities and impediments to investment in multi-purpose forestry including some of the issues regarding the creation of markets for ecosystem services and the outlook for future products.

This report sets out to document the findings of the project including:

- what has been learnt about PPP principles and processes;
- guidelines that should be used in developing public-private reforestation investment partnerships suitable for regional scale programs and;
- emerging policy and investment frameworks that are capable of integrating environmental and commercial drivers.

1.2 Context – commercial revegetation

It is now generally accepted that large scale reforestation of the agricultural regions of SE and SW Australia is necessary for salinity mitigation, catchment health and biodiversity enhancement. In this report we refer to commercial revegetation and multi-purpose plantations as plantings which aim to provide public benefits, as well as producing commercial returns from products or services such as carbon sequestration. The Victorian Private Forestry Council refers to this as Joint Production Forestry - reforestation that delivers forestry production and environmental services (PFC 2003).

The scale of revegetation required is huge: for example in Victoria alone (Australia's smallest mainland state) an estimate of between 1.4 million and 2.6 million hectares of revegetation are needed to meet vegetation targets established by the Catchment Management Authorities². Similarly, it has been estimated that in some catchments more than one third of the land cleared may need to be revegetated to address salinity problems (Hatton 2002), not to mention biodiversity and catchment enhancement needs or greenhouse gas sequestration opportunities.

Governments are already investing substantial public funds in programs intended to tackle NRM issues (NAP³ and NHT⁴) and trialling market based approaches to deliver NRM⁵. These funds are likely to remain insufficient to achieve the scale of revegetation required unless they can leverage substantial private investment. To date in Australia there has only been limited non land-holder, private sector investment in multi-purpose revegetation in the medium rainfall regions (450-700 mm per annum), so more effective approaches to leveraging private investment remain essential (Buffier & Allen 2002).

The rapid expansion of plantations, over the past decade, averaging about 70,000 hectares per annum, in higher rainfall regions, has shown that large amounts of capital will flow into land use change activities (plantation forestry) that are deemed to be commercially attractive with suitably structured investment arrangements. To date this expansion has been mostly for wood fibre production in the high rainfall margins of the continent. For the vast area of medium and low rainfall country requiring revegetation for a multitude of reasons, there are few plantation regimes currently deemed commercially attractive, and therefore these regions are experiencing limited commercial investment in revegetation. A notable exception is the oil mallee plantations in the Western Australian wheat-belt, which are developing to commercial scales. Also there are major R&D efforts such as Flora-search, exploring potential new tree based products and production systems (e.g. Bulman et al. 2002; Harwood and Bush 2002).

It is opportune to investigate how to develop more effective funding and partnership models because significant reforestation is required. Even semi commercial options are likely to be more feasible than reforestation based on the unlikely notion of full public funding. Much of the area requiring reforestation is unsuitable for intensive plantation forestry due to lower and more variable rainfall, but may be suitable for new forms of multi-purpose forestry. This contrasts with the higher rainfall regions where plantations have been successfully established as a major land use, and extensively marketed as a diversified investment product.

Land use change on the scale envisaged in the numerous regional plans, like those developed by the Victorian CMA's, will require a substantial program of capital investment. Innovative funding arrangements are required to support land use change, including innovative forestry.

² Victoria's catchment based vegetation strategies nominate targets ranging from 15% to 30% of Ecological vegetation community (EVC). Greening Australia Victoria has estimated that approximately 1.4 million hectares need to be revegetated if these targets are to be met. Furthermore if a target based on achieving a uniform 30% of EVC is used over 2.66 million hectares are needed. Victoria has endorsed a Native Vegetation Management Framework (2001), accompanied by 10 Regional Native Vegetation Plans (1 for each CMA). The framework and the plans adopt the "net gain" principle. Individual plans specify significant targets for increases in vegetation cover. Planned increases per CMA region in vegetation cover range from 13,000 (East Gippsland) to over 600,000 (NCCMA) hectares.

³ www.napswq.gov.au

⁴ www.nht.gov.au

⁵ www.napswq.gov.au/mbi

There is a strong need not only to research new landscape options, but to have robust implementation methods that include commercialisation. Technical, commercial, institutional and financial innovations are required to accelerate the development and delivery of a diversity of self sustaining land use options.

1.3 Planning to achieve multiple outcomes

If multi-purpose revegetation is to reach its potential in the lower and medium rainfall regions, processes for effective participatory planning need to be coupled with mechanisms for sharing costs, benefits and risks that can bring together public funding and private sector investment.

Planning processes need to be conceived of as more than technical or risk management exercises because it is necessary to clearly articulate a vision for the future landscape based on sound science, which includes increased vegetation cover, and which is sensitive to and reconciles divergent community values (Alexandra and Campbell 2002). Australian forestry professionals have had a long involvement with reconciling community values and forestry development through community forestry projects overseas. Community forestry plans to achieve social and ecological equity through including communities in the implementation of projects (RECOFTC 2005).

With suitable investment frameworks, and clear visions of future landscapes multi-purpose reforestation projects could:

- Reduce salinity and protect and restore the health of rivers;
- Improve water quality;
- Restore and enhance significant areas of habitat;
- Grow high quality hardwood timbers;
- Create plantation firewood and bio-energy resources;
- Sequester significant quantities of carbon dioxide and;
- Generate new enterprises, employment and other social benefits;
- Be undertaken in cooperation with regional communities in manners consistent with community forestry principles⁶.

Investment frameworks suitable for multi-purpose forestry must be able to bring together multiple investors with different goals, each willing to invest for different reasons in generating different products and services. Therefore depending on the local and regional needs, location, the project objectives and design⁷ multi-purpose forests will generate different mixes of benefits: some will be predominantly environmental, others will be mainly focused on wood production, while others will be designed and located to generate multiple benefits. Each benefit stream would need to be “sponsored” or purchased by clearly defined investors from either the public or private sector, each of whom would need to be clearly entitled to capture their type and share of the goods or services generated.

One key challenge is to design a planning and investment system that can accommodate the varying kinds and levels of uncertainty and the widely varying public and private benefits expected to be generated by “multi-purpose forests”. However planning revegetation projects that have a well defined likelihood of achieving the intended products, services or benefits is fraught with uncertainty. Factors

⁶ Community forestry as defined by The Regional Community Forestry Training Centre for Asia & the Pacific (2002) requires that communities are actively involved in planning and implementation of forestry projects that aim to achieve social and ecological equity.

⁷ Design is used here broadly to include project and site design – that is a regional reforestation program may actively involve design at all scales and that benefits generated are highly dependent on the project planning and site design. For more information on a diagnosis and design approach see www.farmforestline.com.au

which contribute to the difficulty of planning for reforestation projects include: technical uncertainty re growth rates, species, provenances in unproven silvicultural systems etc; the time scales involved; the deferred environmental benefits and yields; and the many complex environmental and social relationships (Alexandra and Campbell 2002).

Achieving this will require appropriate planning processes and the development of appropriate policy and investment frameworks that can “package” or broker deals between the various parties who wish to invest in various flows of products and services that will be generated by new forests. Such frameworks require clear definition and marketing of the new bundles of “property” rights – future wood, carbon, water quality, catchment health, habitat or salt storage etc - and ways of establishing or allocating commercial values for these. Victorian legislation defines these rights and makes it possible to own land, the tree growing on it and the carbon sequestered separately.

It will also be necessary to ensure that new and existing landholders have suitable ways of participating and sharing in the benefits. Support from catchment committees, NGO’s and local governments will be required for projects to gain credibility and community support.

In principle, public funds should not be invested in projects unless there are clearly defined public benefits and the rate of public investment should be based on a reasonable and transparent assessment of public benefits to be generated. However in the case of revegetation there remains uncertainty about how to value services produced by ecosystems.

Effective and ongoing collaboration between farmers, industry, capital markets and governments will be required in establishing and refining frameworks and making them work.

1.4 New forests – new assets, protecting old assets (catchment, nature, functional ecosystems)

Large scale revegetation, natural regeneration of woodland and forest species, and multi-purpose forestry have the potential to create substantial new asset classes that are currently ill defined but include private forests, farm forests, multi-purpose plantations, habitat holdings, salt stores and regional carbon pools. These assets could generate income through a combination of Kyoto or non-Kyoto carbon-credits, production of future timber resources and the delivery of ecosystem services. Services like habitat enhancement and catchment and water quality protection could be paid for through long term “environment repair” contracts. These may be issued by governments and/or NGO’s or by the private sector where for example companies wish to mitigate environmental impacts generated elsewhere.

A combination of both a supportive policy environment and suitable commercial arrangements are required if land use change is to become a dynamic business opportunity. Once the dynamism of a competitive market starts to work there is no doubt that unforeseen innovation will occur.

While ecosystem services may be seen as a growth frontier, there is nothing wrong with good old fashioned production of goods and services currently traded in the market. So the opportunity for sawlog production in the medium rainfall areas should not be ignored. There is substantial evidence of the lower rainfall plantations producing high quality timber (as well as secondary forestry products like posts, poles and firewood) within reasonable time frames (e.g. 30 years plus) but that the yield per hectare are lower than higher rainfall plantings. Nonetheless, the value of the land and its productive potential for agriculture are also generally lower. The Majorca plantations of sugar gum – near Maryborough in central Victoria are an example of a multiple-age, self-regenerating stand that has produced saw logs etc, while retaining canopy cover on a poor site in the medium rainfall band (500 – 600 mm average annual rainfall). It was originally planted by the Victorian Soil Conservation Authority on a site deemed so poor that trees were the only option for protecting the site from erosion. There are now vast areas of similar grazing land with equivalent forestry potential, where income from wool growing is low and where a range of NRM issues are prominent.

Forestry industries are increasingly exploring options for alternative long-term timber supplies from sources other than native forests in order to satisfy increasing demand in rapidly industrialising Asian countries, particularly China, plus mature but increasingly environmentally sensitive markets such as Australia. The Victorian Association of Forest Industries (VAFI) has been actively exploring options for expanding plantations for sawlog production. It has proposed a model of funding increased sawlog production from plantations (see section 6) and the Commercial Environmental Forestry Project is piloting options for plantations that address both salinity and timber production in the South west Goulburn (see section 5). The Victorian Plantation Investment Strategy⁸ acknowledges these opportunities and aims to support expansion of forestry in to areas that generate multiple benefits.

Carbon sequestration represents a further opportunity because we are likely to be entering an era of carbon-constraints on economic activity. While at present it is unclear exactly how Australia will operate within global carbon markets, it is generally accepted that carbon will form a major part of the emerging ecosystem services markets and there is likely to be both increases in market scale and value. For example the European Union Emissions Trading Scheme⁹ (EU ETS) came into force on January 1 2005 and the Kyoto Protocol¹⁰ on the 16th February 2005. It is anticipated that eventually the force of both markets and international pressure will result in Australia participating in what may become one of the largest commodity markets in the world. In anticipation of this, the Australian States have agreed to try to establish a carbon market within Australia (The Age 2005)

Participation in carbon markets presents a massive opportunity to generate income from reforestation large areas of cleared land while also addressing serious NRM issues. Carbon and other ecosystem service markets may accelerate the expansion of the “plantation estate” into regions currently regarded as marginal by the plantation sector because to date plantation viability has largely been assessed on investment returns generated by forecast income from wood-fibre sales. Furthermore, harnessing powerful market forces could enhance effectiveness of NRM programs, overcoming the problems that have emerged due to NRM programs evolving in isolation from market based reforms due to the tendency in policy and program development to separate the market (production) and non-market aspects (environment/ community) of rural development.

Additional impetus for new tree based land uses are occurring due to changing commodity markets including lower wool prices, increasing demand for forest products and emerging markets for carbon. Structural and demographic changes in rural industries, such as declining real returns from grazing enterprises, increasing numbers of city investors buying rural land and an aging population of farmers, are also likely to result in large amounts of land changing hands in the next decade.

⁸ Victorian Department of Primary Industries 2005, Draft Plantation Investment Strategy.

⁹ <http://europa.eu.int/comm/environment/climat/emission.htm>

¹⁰ www.unfccc.int

2. The Project

2.1 Project focus

The project explored the opportunities and constraints to combining public and private sector investments to finance regional scale reforestation initiatives intended to achieve multiple outcomes.

The research is underpinned by the view that there is a concerted need for:

- effective investment frameworks for industry development and environmental repair
- improved capacity, experience and profitable opportunities for private sector investment in multi-purpose plantations
- exploration of commercial revegetation options in regions currently regarded as not commercially viable
- land use change which meets the needs of regional communities, stimulates regional economies and generates employment
- increased capacity to tackle salinity threats, habitat enhancement and other NRM goals strategically, cost effectively and on a large scale.

By primarily focusing on the situation in Victoria, the project explored how to:

1. Stimulate sizeable investments where the returns could be generated from some combination of salinity and water quality benefits, enhanced habitat and greenhouse offsets (carbon credits), fuel, fibre and the long term production of plantation timbers.
2. Establish public-private investment frameworks that could allocate cost, risks and benefits from investment in projects that aim to result in the protection of land and water resources, enhance biodiversity and generate future wealth.

Technical aspects of species selection, growth rates and broader investment issues such as taxation were only addressed broadly in relation to how they affect the primary focus of the project as outlined above.

2.2 Research Objectives

The objectives of the project were:

- To generate interest in multi-purpose agroforestry, landscape change and ecosystem services amongst capital markets
- To understand opportunities and constraints to the effective application of private and public sector investment in multi-purposes afforestation.
- To increase capacity for public programs to leverage private investment in reforestation.
- To investigate public-private partnerships (PPP) with a view to financing Australian reforestation.
- To develop a set of generic PPP guidelines for use in forestry investment that has a landscape repair component.

2.3 Overview of methods used

The project was undertaken using the following methods:

1. The production of a comprehensive background paper based on a literature review.
2. The establishment and operation of a project reference committee that acted as a project “think tank”.
3. Additional consultation with people involved in R&D, industry, commerce and NRM
4. An analysis of the findings of both the consultation and the literature and the preparation of this final report.

2.3.1 Literature Review

In late 2003 and early 2004 an extensive literature review was undertaken. A 62 page report - Exploring the Prospects of Public Private Partnerships for Major Reforestation Initiatives - was prepared and distributed to the project reference group in February 2004 and other interested parties. It was based on a review of literature on various types of PPP arrangements being used around the world and on forestry investment and incentive schemes in Australia with a focus on the structures, applications and frameworks of PPPs. Also reviewed were documents on Managed Investment Schemes (MIS), prospectuses, and various government incentives for farm plantations. The literature reviewed is summarised in Sections 3 and 7. The literature review was circulated amongst a project reference committee prior to the first meeting as the basis for discussion.

2.3.2 Project Reference Committee

The reference committee was established at the beginning of the project with an aim to include professionals with extensive knowledge in forestry, investment and financing, catchment management, and natural resource policy. A list of people on the committee can be found in the acknowledgements at the beginning of this paper. The reference committee was used to help refine the scope of the project and to maintain a realistic and useful focus throughout the research. For instance the committee recommended that the project maintain a focus on investment structures and opportunities. Detailed technical information was considered beyond the scope of the project. The committee met four times over an eight month period. Some meetings included presentations on related initiatives to generate discussion and ensure the project was up to date with commercial and government initiatives.

The final meeting was used to clarify the key findings outlined in the executive summary and the guidelines proposed in Section 3.

2.3.3 Industry Consultation

The researchers tested the ideas generated by the literature review and committee meetings by interaction with a range of industry representatives and peak bodies such as VAFI and by attendance at a number of meetings, workshops and seminars such as the CEF steering committee meeting, AFG Ballarat, the Bendigo launch of box-ironbark initiatives, carbon reporting launch, and the Victorian joint production forestry workshop. A list of people consulted is provided in the acknowledgements section of this report. Participation in an AFFA and CSIRO hosted workshop in Canberra on 30th June, 2003 helped to clarify the focus of the study in relation to the range of initiatives being undertaken currently around Australia. Presentations on finding investment for revegetation were made in various forums in Victoria, including the annual catchment management conference.

2.3.4 Final report preparation

In the period from November 2004 to April 2005 the documentation and findings were analysed further and reorganised to form this final report.

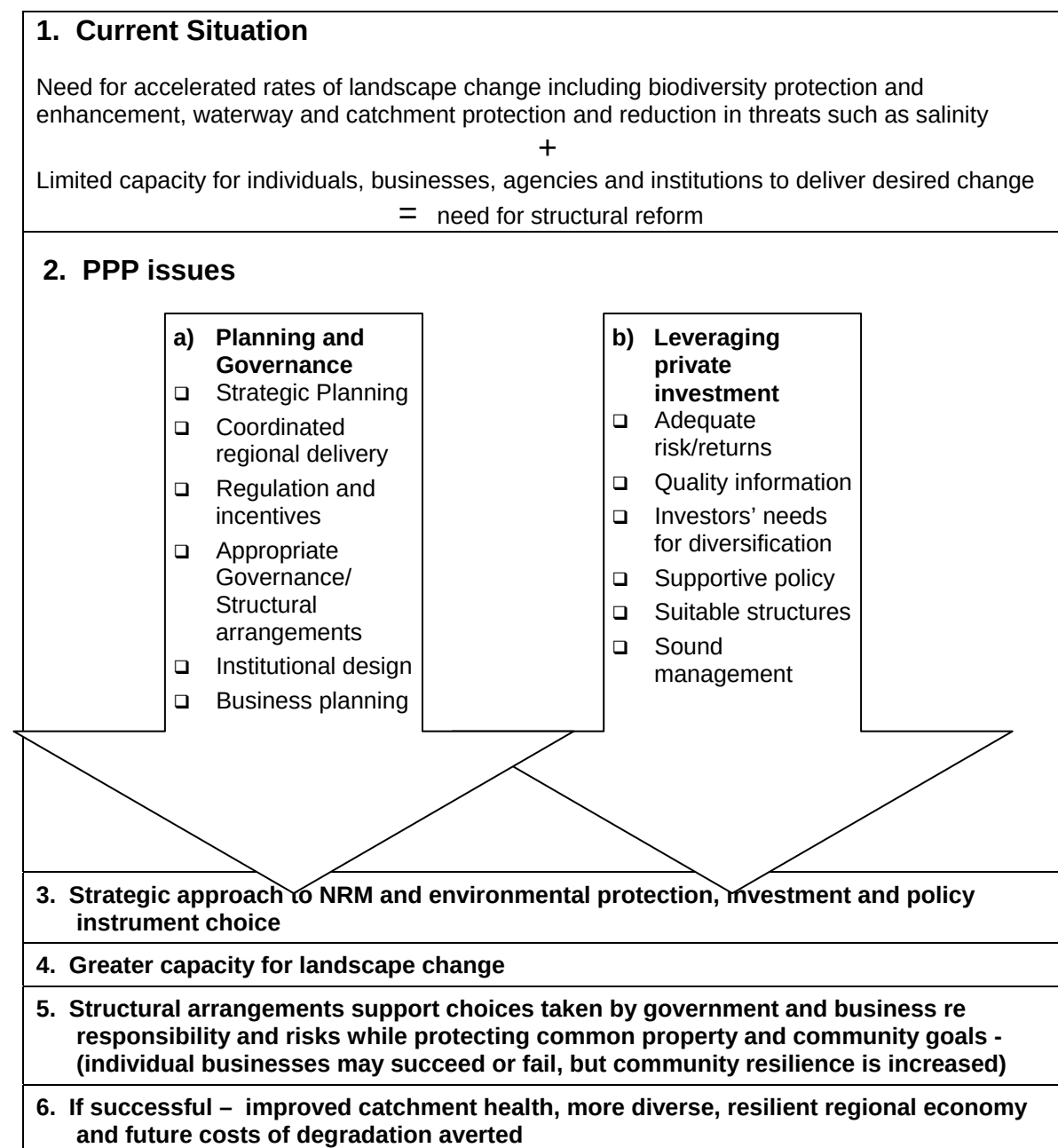
2.4 Report structure

Section 1 of the report is an overview of issues and opportunities, and summarises the project findings in terms of financial and investment issues; forestry and NRM issues; and opportunities and constraints to PPPs. Section 2 briefly describes the approach and methods used in conducting the research. Section 3 tries to answer the question “Are PPPs suitable for reforestation in Australia?” Given that PPPs have been successfully used for a diverse array of applications from waste water and transport infrastructure to urban renewal and public housing, there is no reason to believe they are unsuitable for reforestation and other environmental initiatives. This section concludes with a set of broad guidelines for advancing the development and use of PPPs. This is timely given that most Australian States are gaining greater confidence in using PPP for major infrastructure projects, and that at the time of writing (April 2005) the Commonwealth announced a major revision to its procurement and PPP policies.

Section 4 looks in more detail at the NRM and policy context and examines the potential role of multi-purpose forestry in relation to the NRM challenges. Section 5 sketches out the background and current situation in the Goulburn Broken region of northern Victoria, where the CMA and other agencies are attempting to broker joint public and private sector funding of revegetation. Section 6 documents a range of investment and business activities and several related public programs that individually are promoting increased forestry in Victoria. Section 7 attempts to summarise the extensive literature on PPPs in terms of the potential lessons for reforestation.

In other sectors, both in Australia and overseas, there has been extensive use of PPPs. This has led to the formation of successful public private partnerships for specific projects and the formalisation of processes for negotiating and implementing them. The relevance of this experience to reforestation in Australia is documented in sections 2 and 7.

Figure 1. Why focus on the PPP issues?



3. Are PPPs suitable for reforestation in Australia?

3.1 Introduction

This section explores the experience of PPP in other sectors that could be usefully applied to developing frameworks, processes and structures for multi-purpose reforestation investment arrangements in Australia. A series of guidelines for establishing PPPs were reviewed with a view to interpreting the relevant lessons for afforestation. The section finishes with our proposed set of guidelines for advancing PPPs for reforestation in Australia.

3.2 What are PPPs?

A Public Private Partnership (PPP) is a contractual agreement between a public agency and a private company or consortia of companies. Through this agreement the skills and assets of the public and private sector are shared in delivering a service or facility. In addition to the sharing of resources, each party may share in the potential risks and rewards associated with the delivery of the service and/or facility (DELG undated, p.9).

PPPs can take a variety of forms, and are specifically developed to suit the needs and circumstances of individual projects (See Appendix 2 for examples of different types of PPPs; and <http://www.ppp.gov.ie/faqs/glossary/>) The European Commission's PPP Guidelines makes it clear that there are no predetermined formulas, stating *"many forms of PPP exist and are continuously being developed to suit project characteristics. The main defining feature is the degree of private control over and involvement in financing. There is no unique model nor do the Guidelines suggest the development of one. Each project will define what is suitable and what is required"* (European Commission Directorate General 2003, p.16).

3.3 PPPs in Australia

The increasing use of PPPs is part of a wider realignment of public sector responsibilities which has included privatisations, corporatisation and outsourcing. In Australia, as part of the "privatisation agenda" of the past two decades, a wide range of previously publicly owned and operated services and facilities are now owned and/or operated by the private sector, including banks, airports, telecommunications, public transport, freeways, power, gas and water utilities, welfare and employment services. This process has not been without tensions and critics but a full examination of this process is well beyond this project. However it should be acknowledged that there has been considerable opposition and criticisms to the trend of privatisations, corporatisation and outsourcing which range from concerns about job security to the problems of corporate welfare and fundamentally bad deals for the public.

More recently PPPs are being employed for complex urban redevelopment projects such as the redevelopment of Spencer Street Station in Melbourne or the Southbank TAFE redevelopment in Brisbane (AFR 20 April 2005). Victoria has established a dedicated agency - Partnerships Victoria –a branch of Treasury which administers and coordinates a whole of government approach to PPP in Victoria (Partnerships Victoria 2003). It was established by the Victorian Government to facilitate coordinated negotiation of partnerships between the Government and businesses. It aims to improve performance and efficiency by utilising the innovation, capabilities and skills of both sectors. It is modelled upon the Partnerships UK (see section 7) and focuses on the delivery of public infrastructure and ancillary services.

PPPs in Australia have so far been adopted exclusively by the state governments as they are in charge of most of the country's infrastructure and PPPs present value for money due to tax concession structures (Stone 2005). The federal government is currently reviewing tax structures and exploring ways to reduce excessive administration with a view to increasing the opportunities

for PPPs at a national level. This presents a significant opportunity for multi-purpose afforestation to make its entrance on the national infrastructure stage, given the Commonwealth is already funding much revegetation via the NAP and NHT.

3.4 Why are governments choosing to use PPPs?

The Irish Department of Environment and Local Government sums up the many reasons why PPPs have proven attractive to Governments and the private sector:

By working in partnership it is presumed that governments can achieve multiple objectives while apportioning the financial and technical burden, the private sector can effectively meet their contractual obligations while ensuring financial sustainability over the long term ... (DELG undated, p.9).

The EU guidelines (European Commission Directorate General 2003, p.23) state that “PPP arrangements are particularly attractive as they afford all the implementation and operational efficiencies ..., together with new sources of capital”.

One of the underlying motivations of governments for the adoption of PPPs is due to financial shortages in the public sector. By bringing private sector investment into projects, the total pool of funds available can be markedly increased without over-extending Government budgets. However there is much more to the use of these mechanisms than maintaining borrowing limits. A detailed break down of the possibilities for PPPs compared to the requirements for effective reforestation in Australia is provided below.

3.5 Benefits and motivations

The following benefits and motivations are listed by the EU in the European Commission’s PPP Guidelines (2003, p.15). Table 1 interprets these benefits for Australian reforestation:

1. **Acceleration of infrastructure provision** - PPPs often allow the public sector to translate upfront capital expenditure into a flow of ongoing service payments. This enables projects to proceed when the availability of public capital may be constrained (either by public spending caps or annual budgeting cycles), thus bringing forward much needed investment.
2. **Faster implementation** - The allocation of design and construction responsibility to the private sector, combined with payments linked to the availability of a service, provides significant incentives for the private sector to deliver capital projects within shorter construction timeframes.
3. **Reduced whole life costs** - PPP projects which require operational and maintenance service provision provide the private sector with strong incentives to minimise costs over the whole life of a project, something that is inherently difficult to achieve within the constraints of traditional public sector budgeting.
4. **Better risk allocation** - a core principle of any PPP is the allocation of risk to the party best able to manage it at least cost. The aim is to optimise rather than maximise risk transfer, to ensure that best value is achieved.
5. **Better incentives to perform** - the allocation of project risk should incentivise a private sector contractor to improve its management and performance on any given project. Under most PPP projects, full payment to the private sector contractor will only occur if the required service standards are being met on an ongoing basis.

6. **Improved quality of service** - international experience suggests that the quality of service achieved under a PPP is often better than that achieved by traditional procurement. This may reflect the better integration of services with supporting assets, improved economies of scale, the introduction of innovation in service delivery, or the performance incentives and penalties typically included within a PPP contract.
7. **Generation of additional revenues** - the private sector may be able to generate additional revenues from third parties, thereby reducing the cost of any public sector financial support required. Additional revenue may be generated through the use of spare capacity or the disposal of surplus assets.
8. **Enhanced public management** - by transferring responsibility for providing public services, government officials will act as regulators and will focus upon service planning and performance monitoring instead of the management of the day to day delivery of public services. In addition, exposing public services to competition enables the cost of public services to be benchmarked against market standards to ensure that value for money service is being achieved.

Table 1 Interpretation of EU benefits if applied to reforestation and NRM in Australia

EU listed benefit	Interpretation if applied to multi-purpose afforestation and the NRM situation in Australia
Acceleration of infrastructure provision	Accelerate land use change by converting funds assigned to NRM or environmental grants to a pool of funds to pay for environmental service payments
Faster implementation	Strong incentives for the private sector to deliver environmental services in the most cost effective and efficient manner possible – the structuring of payments around outcomes (service delivery) rather than inputs would encourage this
Reduced whole life costs	A large stake by the private sector/landowners in the long term success of land use change over the life of the project is a critical way of achieving shared responsibility
Better risk allocation	Risk allocation is fundamental to forestry and environmental projects and would form a core platform for negotiation of agreements. A series of predetermined review and renegotiation points (e.g. every ten years) would allow for reallocation of risks against predetermined principles.
Better incentives to perform	Better incentives to perform (i.e. contractual payments are made against standards and targets being met)
Improved quality of service	Public sector would be clear about its criteria for success and contractual arrangements reflect this to support innovation, efficiency and quality in service delivery.
Generation of additional revenues	Private sector should be encouraged to explore a full range of income sources from third parties – e.g. global carbon markets, future wood or fibre supplies etc – as a way of reducing the cost of delivering the desired environmental service.
Enhanced public management	Governments should focus on specifying the nature and quality of the service required and on monitoring performance

3.6 Testing a hypothetical vegetation investment scheme against Partnerships Victoria criteria

Partnerships Victoria has listed criteria for assessing potential PPPs (2000, p.4). The following section investigates the implications of these for a reforestation pilot project proposed in Alexandra & Associates' Goulburn Broken Landscape Change project of 2002 (see section 4). More investigation is required into some of these features, but the Pilot study proposed appears to be a feasible potential PPP.

Table 2 Partnerships Victoria criteria and reforestation

PPP Component (Partnerships Victoria)	Implications for designing a reforestation PPP
Outputs clearly specified including measurable performance standards;	Measurable performance standards applicable to a wide range of sites and issues need to be developed
The Government making payments only upon delivery of the specified services, to the required standards;	Government payments would flow to projects sequentially when they meet specified environmental service standards e.g.: % canopy cover, tree survival etc
A relatively long-term commitment, with the term depending upon the nature of the project;	Spencer St Station redevelopment has a 30 year term. This would be appropriate for reforestation initiatives
One or more private parties, fully accountable to the Government for the delivery of the specified services	Either a dedicated party responsible for contracting with multiple providers or government agency e.g. a CMA contracts directly to multiple providers.
Risk allocation between the parties being clear and enforceable, with consequential financial outcomes	Risk allocation will need to be defined at the contracting phase.
Clear articulation of the Government's responsibilities, with respect to the monitoring of outcomes;	Outcomes would be monitored to determine the delivery of the specified environmental services and accompanying payment.
Inclusion of mechanisms for delivering ongoing value for money throughout the life of the project.	Wherever possible, project costings will be determined by competitive tendering processes or equivalent. Various reviews and trigger clauses can be written into contracts to ensure ongoing value for money

Taking note of and the Victorian Guidelines and the benefits listed by the European Union and how these might be applied to multi-purpose reforestation in Australia has led us to our first key finding:

Existing financial, legal and policy mechanisms for PPPs appear suitable for major reforestation initiatives. Therefore generic PPP guidelines and precedents developed in other sectors could be used for planning and implementing multi-purpose forestry programs that deliver 'public good' objectives, such as landscape repair, and private sector investment returns from timber production and carbon sequestration.

Taking note of the ability to align the PPP guidelines and the hypothetical vegetation investment proposed in 2002 for the Goulburn Broken CMA (Alexandra & Associates, 2002) has led us to our second key finding:

Investments in large scale reforestation for catchment management purposes should be regarded as a form of infrastructure maintenance or renewal in order for them to become eligible under the existing guidelines developed by the Department of Treasury (Partnerships Victoria Guidelines).

3.7 Constraints to PPPs for reforestation

While partnerships between the private and public sectors appear to be an appealing solution for multi-purpose reforestation, the project found the following constraints to effective reforestation PPPs:

- Information and technical constraints
- Policy and administrative constraints
- Limited concepts of what constitutes viable forestry
- Land ownership patterns in parts of Victoria.

3.7.1 Information and technical constraints

Information and technical constraints included:

- Uncertainty due to poor technical and spatial information re factors such as growth rates, salinity processes etc.
- The uncertainty and/or unreliability of information on catchment impacts (positive and negative).
- Accessibility of information on low and medium rainfall forestry, including basic factors such as the reliability of growth rates.
- Limited information on reforestation needs and options in a form suitable for potential private sector investors such as farmers, individuals or the capital markets. Recent advances in plantation forestry have been focused on higher rainfall areas where plantation silvicultural systems have been successfully promoted in Australia.
- High levels of risk or poor information for risk and return analysis, including future values of forestry products.

3.7.2 Policy and administrative constraints

Policy and administrative constraints included:

- Lack of supporting policies and institutions.
- Lack of government or private sector investment focused on this market segment.
- Inexperience and lack of precedents in designing collaboration of this nature.
- Absence of firm markets for environmental services such as carbon credits in Australia.
- The reliance on blunt instruments like taxation arrangements to promote investment in sustainable land use and plantations which are difficult to target to specific regions or parts of regions.
- Governments' preference to rely on grants to landowners (either individually or as groups) and small government agency projects as their primary form of NRM investment.
- A strong Government preference to rely on market processes to meet their plantation establishment targets outlined in Plantations 2020.

3.7.3 Forestry viability constraints

Constraints that have arisen from the type of forestry deemed viable include:

- A focus on higher rainfall regions where plantations are viewed as a viable investment on production factors alone.
- A narrow focus on fibre production, industrial style plantations, in Government programs like "Plantations 2020" which has an ambitious target of tripling the area of plantations.
- No effective framework for negotiating joint investment from the public and private sectors.
- The nature of the long term timeframes involved.

3.7.4 Land ownership constraints

The GBCMA Landscape Change project (Alexandra & Associates, 2002) and the CEF project have identified **land ownership as a constraint** in parts of Victoria due to:

- Dispersal of land ownership due to the history of land settlement that has resulted in many relatively small land titles and a large number of houses across the landscape.
- The relatively high cost of land as compared to other areas attracting reforestation investment.

Taking note of the constraints identified:

Government initiatives should recognise the importance of building institutional and professional experience and familiarity with multi-purpose forestry developments and the use of PPP's to address environmental issues. Further pilots should be funded, possibly via the Market Based Instruments (MBI) program, which stimulate market interest, test the capacity of PPPs to leverage private investment for reforestation, and build institutional and professional capacity.

3.8 Guidelines for advancing PPP for reforestation

The project set out to produce a set of guidelines, which could support the development of PPPs. The following are proposed:

1. A framework for PPP development should be **flexible** so as to be applicable to a wide variety of projects and situations. Guidelines should be developed which are based on clear principles, including public benefit tests, and projects should be assessed on their likely outcomes. Where possible Governments or NRM bodies should specify the outcomes that they are trying to achieve and willing to pay for. Over time it is assumed that this will encourage further innovation in both financing, landscape design and reforestation techniques.
2. There is a need to look at a range of options for structuring deals. Ways of cost sharing, benefit sharing and/or risk sharing are required that can bring together public and private sector investments to finance projects with clearly defined and specified objectives. An overall framework which is sufficiently flexible is required to allow for different conditions, circumstances and risks and rates of returns etc. Negotiation arrangements are required for ensuring that the greater the risk taken by a stakeholder or investor, the greater the potential return. Risk and reward should be allocated proportionally. Triggers and timing of any renegotiation of agreements should be predetermined by the parties involved.
3. Long-term deals can be broken into shorter "renegotiation" periods based on pre-determined time or trigger clauses. This would help reduce uncertainty for the private sector, and allow for managing expectation and risk, for instance due to changing carbon prices. Good commercial contracts can provide renegotiation triggers.
4. Where there are high levels of uncertainty regarding environmental benefits - e.g. will planting a forest reduce salinity in stream x kilometres away – Governments or NRM bodies should determine the extent to which they take the risk induced by poor knowledge of the underlying environmental processes. While uncertainty and complexity may reduce the certainty of outcomes, governments are able to make contractual options available based on assumed rather than measurable outcomes.
5. A carbon register should be established to facilitate and monitor trade. This is a current impediment to the market, but the current proposal by the Australian States to establish a carbon market may overcome this.

6. If long term contracts are to be entered into, in addition to short-term grants, funding will most likely need to be underwritten by the State, as the CMAs cannot guarantee funding over the life of an environmental forestry project – e.g. between 10 and 30 years. Other PPP contracts – such as the Spencer Street Station redevelopment - have been entered into with a time frame of 30 years and therefore offer a precedent for long term arrangements.
7. Prior to the development of more mature markets, resources are required to support negotiation mechanisms and processes in addition to on-ground projects. For example, the CEF project is identifying a range of constraints to cost-effective contracting that need to be streamlined (see Section 5).
8. Transaction costs of dealing with multiple agencies and streams of State and Commonwealth Program funding needs to be reduced if projects are to cost effectively address multiple NRM outcomes.
9. If multiple purpose plantations are to meet the needs of a range of parties, these parties should be involved from the outset. For example, negotiation processes need to ensure the presence of a range of prospective investors including timber companies etc to ensure that the perspectives of different parts of the market are presented.
10. Negotiation processes need to clearly define the different interests and concerns of private and public stakeholders and need to result in clearly defined roles and responsibilities for all parties. Negotiation processes need to ensure that respective shares in risks are adequately determined and clearly allocated.

4. Australian NRM and Policy Context

Commercial activities that can establish revenue streams from deep-rooted perennial trees and shrubs are central to managing the large-scale challenge presented by salinity (AGO 2001, p.18.)

4.1 Introduction

In this section, the issues and relationship between forestry and NRM are discussed. In the last decade, in parallel with the emergence of regional NRM processes, there have been substantive reforms to forestry and plantation policies and associated programs (e.g. the Farm Forestry Program) that have aimed to accelerate the uptake of plantation and farm forestry, however there is still further progress required if the full potential of reforestation to contribute to NRM is to be realised.¹¹

4.2 Forestry and NRM challenges

Australia faces major NRM challenges: to address salinity, the loss of biodiversity and declining water quality, fundamental changes in land use must be made on a substantial scale (NHT 2001; NLWRA 2001). In response, Australian governments have adopted a wide range of policies and strategies, including the NAP and NHT2, based on regional processes of NRM planning and implementation. There is a growing acceptance that current rates of change are insufficient to stop the decline of catchment health and that new approaches are needed. Some indeed are calling for a “Revolution in Land use” (see Stirzaker et al. 2000, MDBC 1999 & 2000, MDBMC 2001) as well as the retirement of extensive areas of rural land from agricultural production in order to focus on the provision of ecosystem services (VCMC 2002). New forms of forestry could play critical roles in landscape change aimed at addressing these kinds of NRM issues and the efficient delivery of ecosystem services.

4.2.1 Landscape change

Enhancing delivery of landscape change is a major prospect for reforestation. Landscape change is emerging as a concept to describe fundamental land management change undertaken on a major scale to improve landscape health and to address problems such as loss of biodiversity, salinity and declining water quality. Consensus on the scale, urgency and nature of the NRM challenges and the interconnectedness of biodiversity, vegetation, and ecosystem function or catchment health is emerging slowly and patchily. There is less clarity about the policy, technical and investment options for achieving the desired outcomes (Alexandra & Associates 2002).

Research has been instrumental in advancing understanding of the nature of leakage from conventional agricultural systems based on annual species of crops and pastures. The Redesigning Agriculture for Australian Landscapes (RAAL) Program has quantified leakage from agricultural systems in comparison with native vegetation (Price and Williams 2001). It is now widely accepted that control of dryland salinity requires significant reduction in leakage by increasing plant water use across the sheep wheat belt (Stirzaker et al. 2000, MDBC 1999, MDBC 2000, Walker et al. 1999).

In most of the sheep wheat belt, pasture and grain systems are simply not able to utilise the available water. In many situations the “revolution” in land use will therefore require using the “heavy artillery” of deep-rooted woody vegetation to effectively increase water use. Trees planted to reduce recharge can also provide environmental services like storing atmospheric carbon and producing a range of products, including high value structural and furniture timbers (Alexandra 1989 and 1992; CSIRO et al. 2001) as well as other fibre and non wood products.

¹¹ This chapter is based in part on Landscape Change in the Goulburn Broken (Alexandra & Associates 2002) and Plantations and Sustainability Science (Alexandra & Campbell 2002).

Forestry or agroforestry systems are required that can cost effectively deliver multiple environmental and production outcomes. Developing integrated agro-industrial systems capable of generating multiple products and services will involve detailed catchment planning, sound knowledge of environmental processes, new silvicultural systems, new technologies and new approaches to financing, establishing and managing multi-purpose “forests”.

Much of the landscape in which change is required currently generates low returns on capital and farm businesses have little internal capacity to invest in change. However the low rates of return are not necessarily an impediment to change as they mean that alternative land uses have a comparatively low return hurdle, unless the capital value of the land is inflated due to non agricultural values, such as lifestyle or proximity to cities. Regardless of the market price of land there are large areas of land with relatively low productivity and rates of return from grazing activities. There are therefore opportunities for generating income via a combination of conventional products and payments for environmental or ecosystem services such as improved water quality (Alexandra and Hall 1998, Binning et al. 2001). Cost-sharing arrangements negotiated to pay fairly for a mixture of products and services could ensure the viability of plantations in areas currently regarded as uncommercial (MDBC 1996, Binning et al. 2002).

4.2.2 Emerging or new reforestation options

Commercial and semi-commercial plantations are now understood to be a critically important part of the landscape change “tool-box”, particularly in the 450 to 700 mm rainfall zones (CSIRO et al. 2001). The scale of reforestation required is indicated by the targets of millions of hectares set by the Victorian CMAs (described above). Yet the type of reforestation is likely to be dramatically different to previous waves of plantation development and environmental revegetation that was focused specifically on endemic species.

JVAP has funded R&D investigating large scale revegetation options for the sheep-wheat belt. Options being investigated include numerous plantation species and systems suited to different climate zones, traditional and new products such as oil mallees, and short rotation crops for energy (Bioenergy Australia 2000; JVAP 2000 & 2002, CSIRO et al. 2001). Finding new options is particularly important in those landscapes generally deemed too dry for traditional plantations (e.g. less than 700 mm per annum).

JVAP has supported investigation into potential forestry and revegetation options but much more work is needed if we are to create commercial drivers for reforestation in the low and medium rainfall zones (JVAP 2000, JVAP 2001, CSIRO et al. 2001). Integrated systems are needed which generate returns from: timber and fibre products; non-timber products – like energy and oil; catchment and environmental health outcomes; carbon-credits or combinations of all of the above. Commercial opportunities being explored include:

1. Expanding the range and extent of existing plantation based industries, e.g. blue gum and pine plantations in suitable areas.
2. Developing new forms of commercial and semi-commercial forestry using a wider range of species suited to drier areas such as ironbark and sugar gum.
3. Developing new short rotation woody land uses, e.g. oil and biomass crops.
4. Traditional dryland forest industries, e.g. durable timbers, charcoal and firewood.
5. Environmental forests – establishing new forests by revegetating and encouraging natural regeneration primarily for environmental outcomes (Alexandra and Associates 2002).

New processing and harvesting technology will play critical roles in creating viable industries. Much more work needs to be focused on new conversion systems for solid wood, like Andy Knorr’s radial sawing technology. We also require efficient machines for harvesting thinnings for firewood and ongoing work on biomass energy (Howard and Olszack 2004).

4.3 Policy mechanisms to support reforestation

In Australia, policy mechanisms to facilitate reforestation in the past have ranged from direct Government investment in plantations, through removal of impediments to forestry development and facilitation and incentives for private sector investments. In addition, to those focused on forestry there have been a range of programs focused on demonstration, education and facilitation and incentives for revegetation and vegetation management.

More recently Governments have supported regional planning, via regional plantation committees, provided R&D to overcome knowledge and information constraints and supported communication and information exchange¹². Governments have also invested in a variety of R&D projects from low rainfall tree breeding¹³ and market information through to novel processing technologies, though JVAP and other R&D programs.

The Commonwealth's Farm Forestry Program pumped \$63 million into facilitating farm forestry (JVAP 2002) including establishing Regional Plantations Committees and numerous related State initiatives. However, the most potent innovation has been investment arrangements which turned plantations into tax effective investments (JVAP 2002). As a result, there has been a huge increase in the area of industrial plantations of eucalypts for fibre production (mostly pulpwood) in the wetter margins of Southern Australia. However this expansion has had barely any impact on reducing salinity in the vast areas of medium and low rainfall country of the sheep wheat belt (MDBC 1999, 2000, 2001 and Nambiar et al. 2000). Furthermore the expansion of plantations on high rainfall land has involved significant clearing of natural forest and hence has had negative biodiversity impacts (AFR July 20, 2002). There have been issues with loss of scattered trees as well as missed opportunities to enhance biodiversity by planting large areas of single species, mostly blue gums. There have also been numerous concerns expressed about the impact on farming communities and their local economies by the expansion of industrial scale plantations (Tonts, Campbell and Black 2001).

4.3.1 Recent plantation policy reforms

Forestry policy generally and plantation policy in Australia has been in a period of rapid evolution. An examination of recent history makes it clear that much has happened since the 1989 National Conference "*Prospects for Australian Forest Plantations*" (Dargavel and Semple 1990). In the years following the conference, there was a flourish of activity in the form of Commonwealth inquiries and strategies, such as the National Plantation Advisory Committee (Commonwealth 1991) and the National Forest Policy Statement (Commonwealth 1992a), the Resource Assessment Commission's Forest and Timber Inquiry (Commonwealth 1992b) and the Industry Commission inquiry (1993). These were followed by a range of initiatives including the Wood and Paper Industry Strategy (Commonwealth 1995) and the 2020 Vision (DPIE 1997). There have also been changes in international markets for wood and fibre products - including a declining Australian dollar. By the late 1990s the trade deficit in wood products equalled the value of the entire wool clip. There have also been innovations and refinements in plantation genetics and technology. However, the most potent innovation has been creative investment arrangements which turned plantations into very tax effective investments (JVAP 2002).

The last decade has seen a huge increase in industrial plantations - well above any predictions of the late 1980's - mostly eucalypts for pulpwood in high rainfall areas of Southern Australia. Since 1994, plantation area has expanded by an average of 70,000 hectares per year ranging from 30,000

¹² After a successful trial of an information network in 2003, "BushTracks" that aimed to spread information regarding native vegetation management experiences, Greening Australia are in the process of developing an interactive internet based information exchange. More information on: <http://www.nrm.gov.au/publications/network-news/april-2005.html#exchange>

¹³ The Australian low rainfall tree improvement group: <http://www.ffp.csiro.au/alrtig/>

in 1994 to 125,000 hectares in 2000 (JVAP 2002). Apparently, in 1989 no one was predicting this; so with the benefit of 2020 hindsight we briefly review the two contrasting “industry plans” presented in 1989 (Dargavel and Semple 1990).

In the *Wood and the Trees* (Cameron and Penna 1988), the Australian Conservation Foundation (ACF) proposed a phased reduction in native forest logging and a marked increase in hardwood plantations. They called for a total of 17,000 hectares of Eucalypts to be planted per annum on cleared land using a combination of leases, joint ventures etc. On the other hand, the Forest and Forest Products Industry Council (FAFPIC) plan proposed adding a total of more than 500,000 hectares of Radiata Pine to the existing pine estate of 857,000 hectares, adding 65,000 hectares of Eucalypts and to continue using all the existing area of native forests to supply 55 new “world class” mills – 9 pulp and paper, 12 panel and 34 saw mills requiring 11 billion dollars of additional investment (Dargavel and Semple 1990). History shows that both plans contributed to a vital ongoing debate. Both have been proven to be way off the mark. “ACF’s bold plantation plan” (Toyne 1990) has turned out to be surprisingly modest. It picked the right directions – growth in hardwood plantations on cleared, private land – but it severely underestimated their scale. FAFPIC clearly failed to interpret community sentiment and international markets or was making an ambit claim on Australia’s forests; to achieve the industry’s oft stated desired for “resource security”. Neither predicted the importance of tax incentives in accelerating rates of plantation investment (JVAP 2002).

The *Plantations 2020 Vision* (1997) called for an (apparently arbitrary) tripling of plantation area. Policies supporting this goal have facilitated rapid expansion of plantations in regions with high and reliable rainfall, relatively cheap land and access to ports. However, this expansion has also generated a litany of criticism. It has resulted in incompetent and inappropriate clearing, including the destruction of the habitat in Western Victoria of the endangered red tailed black cockatoo. Other criticisms include: that plantations have been poorly sited and are based on large-scale monocultures; that they have mostly displaced rather than been integrated with agriculture; that growth rates and income projections have been overstated; and that they have impacted on rural communities, reducing school and community viability. There are also ongoing concerns about stream flows and ground-water systems, pesticides and the use of 1080 to poison wildlife (AFR 2002).

We are rapidly moving out of an era where planting lots of trees is viewed uncritically as “a good thing”.

Blunt taxation incentives have been unable to maximise sustainability outcomes. We need new approaches to sponsoring plantations that better integrate environmental and economic outcomes and stimulate new kinds of forestry where Australia most needs reforestation. A decade of plantation expansion has had a minuscule impact in the vast areas of medium and low rainfall country that desperately requires reforestation to reduce salinisation and restore landscapes (MDBC 1999, 2000, 2001 and Nambiar et al. 2000).

More than a decade ago, Campbell (1990) challenged the Australian forestry profession to, “*shift our sights down the rainfall scale, away from public land, and towards slower growing, more durable, higher value species. Tackling land degradation with a significant reforestation effort on hungry sites is the best way to do this.*”

With an estimated 17 million hectares at risk from salinity (NLWRA 2001), now more than ever, foresters need to turn their professional skills to the pressing national need for reforestation in the medium and low rainfall regions. We must work out how to direct billions of dollars of investment and forestry expertise to the big picture challenges of salinity mitigation and landscape restoration. Not only is this a professional responsibility, but also a growth frontier for the profession. Landscape restoration will almost certainly be employing the next generation of forestry graduates – but only if they are equipped to operate away from the wetter margins of the continent, and to

deal with complex community and environmental relationships. Unless foresters move into tackling the big sustainability challenges the profession risks becoming ever less relevant (Campbell 1990).

Today's foresters have choices about the scope and direction of Australian forestry and its contribution to society. They can choose to serve narrowly defined needs – satisfying the demand for cheap and abundant wood fibre – or they can play a wider role in helping to reshape how we live and work in Australia's magnificent and diverse landscapes as part of the ongoing quest for sustainability (Dargavel 1995, ACF 2000).

4.4 Informed and supporting land use choices

Most Australians live in the temperate forest and woodland zones close to the coast, because, according to Taylor (1940), Australia's settlement patterns are determined by environmental constraints, including the discomfort experienced in the vast, inhospitable hot, dry bulk of the continent. The temperate forests and woodlands zones are by comparison, relatively well watered and amenable to European-style settlement. Most of the country's agricultural development has occurred here, and in the wetter margins the recent expansion of hardwood plantations has been spectacular. Both these waves of land development – the removal of vast tracks of “scruffy”, idiosyncratic native vegetation and the instigation of parcels of vigorous, uniform fibre farms – have been sponsored by Government policies including decisions to provide favourable taxation treatment to primary production. Agricultural development was supported by generous taxation deductions for clearing. Likewise, increasing plantations is also deemed to be in the national interest. The massive investments in plantation in the last decade have occurred because of the tax effective nature of plantation schemes which achieve *primary producer* status for the investors (JVAP 2002).

Clearing throughout much of the 20th century and plantation development in recent decades are examples of choices Australian society has made to support and to allocate financial resources to specific activities and their resultant impacts in the landscape.

Society defines and allocates resources and places differential value on different land-uses and industries through political processes. Australian Governments continue to allocate substantial subsidies either directly, via tax foregone or through subsidised use of environmental and natural resources (ABC RN 2002, Environment Australia 1996, Industry Commission 1996). “Corporate welfare” is estimated at many billions of dollars and only rarely are the choices and the criteria for making them made explicit and transparent (ABC RN 2002).

Perhaps the closest Australia has come to well-informed land use choices using well-structured planning processes, where the full range of values at stake is transparently on the table, are the Regional Forest Agreement (RFA) process and Victoria's Land Conservation Council (LCC). Both of these processes focused overwhelmingly on public land, and informed decisions about allocation and management of publicly owned resources. The LCC and the RFA processes were both established after politically damaging conflicts; the LCC after disputes about clearing Victoria's Little Desert; and the RFA after loggers blockaded federal parliament (Watson 2002).

Choices about land use and the where, how, what of plantations, and who pays for them, continue to be inherently political. To ensure that knowledge guides policy towards informed decisions we need more well structured, informing or umpiring processes like the LCC or the RFA process. If we are to see sustainability science at work informing policy, and policy changing landscapes, we must equip the informing processes - establish effective institutions capable of proper consultation, quality research and excellence in knowledge management.

As a nation we need better political processes, broader more structured debates about the kinds of landscape and land use policy choices we make (ACF 2000). We need to organise explicit and

transparent choice-making processes that are informed by the best available science because sustainability is fundamentally about the values and choices society makes, and the fortitude to implement them (Industry Commission 1999).

4.5 NRM and participatory planning

Support for community government partnerships has revolutionised land conservation policy and programs in Australia. Governments, community and industry have formed powerful coalitions aiming to integrate production and conservation goals (Campbell 1994; Marriot et al. 1999; Toyne 1992). Landcare and related initiatives¹⁴ have aimed to achieve sustainable land use through a range of mostly voluntary initiatives and supportive Government programs focused on changing farming practices (see for example Earl *et al.* 2001; Goulburn Broken CMA 2001).

Whilst there is much community support for landholder based conservation, reforestation projects meet with a range of responses. These include strongly held objections to monoculture industrial plantations and widely varying perspectives on the importance of timber production, regional economic development, carbon sequestration, salinity mitigation, catchment enhancement and biodiversity conservation. Farmers, landcare groups, the timber industry (including the workers and owners of forestry enterprises), large and small scale investors, governments, conservation organisations and citizens concerned about the future of our rural landscapes are all legitimate stakeholders with differing views on NRM priorities and how they should be addressed (Reid, 2004).

Due to poor conflict management in the past, debates about forestry and the social and environmental impacts of plantation development have been persistent and socially divisive. There is now a degree of wariness and suspicion about hidden agendas. Participatory planning for NRM including the use of revegetation and multi-purpose forests offer a vehicle by which stakeholders could collaborate to satisfy a range of needs and agendas. However, unless there is accompanying policy reforms it is very difficult to reform market processes to create new markets for ecosystems services.

While technical and investment uncertainty are important constraints, these should not be considered the only impediment as factors such as community attitudes; property rights; fire management etc remain important considerations in the success of large scale revegetation. Credible participatory planning processes should be adopted to minimise negative community responses to landscape change.

4.6 Regional plans and targets

In Australia, there is a well defined and general trend towards more clearly defining regional NRM targets.

The Murray-Darling Basin Commission (MDBC) has embarked on a process of setting regional and sub-catchment targets for water quality (salinity and nutrients); water sharing (consumptive and environmental flows); riverine ecosystem health; and terrestrial biodiversity.

The NAP specifies more defined regional targets. The National Action Plan applies to 20 key catchments (6 in Victoria) where it will support development of... "Targets to ensure that integrated catchment/regional management plans contribute to the achievement of nationally

¹⁴ "Landcare" is used as an umbrella term as there have been a range of government funded programs aimed at sustainable land use or sustainable landscapes, such as those funded by the Natural Heritage Trust.

agreed outcomes. Catchment/region specific targets for salt, nutrient, water flow regimes, water quality, stream and terrestrial biodiversity will be required.”¹⁵

The NHT 2 has supported regional plans constructed around identifiable outcomes and targets for which delivery is designed, assessed and ‘operationalised’ at the regional and catchment level.

Victoria has endorsed a Native Vegetation Management Framework (2001), accompanied by 10 Regional Native Vegetation Plans (1 for each CMA). The framework and the plans adopt the “net gain” principle. Individual plans specify significant targets for increases in vegetation cover ranging from 15% to 30% of EVC. According to Greening Australia, Victoria’s (GAV) comprehensive response to the draft framework, planned increases per CMA region in vegetation cover range from 13,000 (East Gippsland) to over 600,000 (NCCMA) hectares. GAV has estimated that approximately 1.4 million hectares of revegetation is needed if all of these targets are to be met, or if a uniform 30% of EVC is targeted then 2.66 million hectares would be needed.

Clearly if substantial progress is to be made on meeting these targets innovative implementation strategies are required that can generate sustained investment in change. This information leads us to find that:

Opportunities exist for governments to redirect NRM, greenhouse and forestry program funds to projects that leverage substantial private investment into multi-purpose reforestation initiatives that address NRM, greenhouse and forest industry objectives.

4.7 Multiple-purpose forestry to support NRM

Multi-purpose forestry can provide a number of outcomes to different stakeholders – e.g. carbon credits, biodiversity conservation, catchment health and timber. There is a danger when describing the amount of revegetation required across Australia to imagine vast monocultures of blue gum plantations or something similar. There is a need therefore to clarify what a multi-purpose forest may look like, and the types of services it may provide.

Design, planning and implementation at a range of scales are critical to achieving the goals of multiple-purpose forestry. Blanket reforestation of cleared areas is not the answer to the current NRM problems. Physical factors such as location, climate and soil type and factors such as land owners’ priorities, the nature of local enterprises and skills, need to be taken into account in planning revegetation that achieves multiple benefits. Reid and Stevens (2000) argue convincingly the need for planning based on a diagnosis and design approach.

Alexandra and Campbell (2002) identified that it is necessary to try to understand “*the prospects for plantations within the physical, cultural and political context of contemporary Australia*” and that there are a series of policy and design factors that are “*critical relationships including:*”

- *Relationships between vegetation management at a landscape scale, catchment hydrology, streamflows and water quality;*
- *Relationships between forest and plantation design, scale and management and the delivery of environmental services (habitat, carbon, run-off, recharge) at a landscape scale;*
- *Relationships between plantation design, scale and management, industry structures and regional development (planning, demography, viability of existing businesses, rating, roads, schools and services etc); and*
- *Relationships between sources and modes of investment in plantations, and community engagement in and support for plantation developments of mixed scale”.*

¹⁵ This is applicable to 6 CMA regions and about 60% of Victoria, for more information see www.napswq.gov.au

4.7.1 Design and planning to achieve multiple outcomes

Plantations have many complex and site specific relationships to other landscape features and processes like remnant native vegetation management, fauna, catchment hydrology, stream-flows and water quality (see for example Nambiar and Brown 2001). Therefore working out how plantations can generate positive landscape change in specific catchments is challenging. A decade of high quality and strategic R&D provides us with indications of the scale and complexity of these relationships and has begun to provide guidance on intelligent design options (Lindenmayer 2001; Stirzaker et al. 2000, 2002; JVAP 2000).

Achieving multiple outcomes from plantations is dependent on design capacity which can address complex landscape relationships and interactions. For example, not all trees or locations generate similar catchment health benefits. Understanding of where to place trees in the landscape is required if salinity or other outcomes are to be achieved (Stirzaker et al. 2000). We stress that we are not suggesting a future in which experts ‘design’ landscapes remotely. Landscapes will continue to be socially constructed as individuals, families, firms and industries respond to signals – especially those of public policy and markets. However at least one, and possibly both, of those great drivers can and should be informed by science linking the placement of commercial plantations in various configurations in the landscape to different landscape outcomes. The JVAP design guidelines provide a synthesis of general design principles but catchment and site specific planning is still required (JVAP 2000).

Due to regional diversity and landscape complexity, uniform forestry or revegetation prescriptions cannot be applied. Therefore any funding of reforestation initiatives needs to have a strong design and planning focus using detailed, spatially explicit information and explicit project criteria that allows for assessment of individual projects and sites.

4.7.2 Protecting biodiversity

Public or private investment in environmental restoration plantings is obviously required for salinity and water quality reasons. Further, if we are to avert the imminent threats of extinction of up to half our woodland bird species, many parts of the Australian landscape need major restoration efforts (Seddon et al. 2001). We cannot undo the clearing of the past but we can reduce the impacts of major reforestation efforts, which if it is done insensitively, could also threaten important species, communities and habitats.

Multiple-purpose forestry will need to be more sensitive to values of remnants, because small patches and even individual trees have proven to be valuable as habitat (Lindenmayer 2001). Secondly, the issues of “weed trees” and genetic pollution must be confronted. The very features of preferred plantation species – vigour, resilience and adaptation to conditions - are what make them potential weeds. Thirdly, it is important to recognise that the new plantations will be growing in already stressed landscapes and that there are decline trends which are frightening in their magnitude and implications – rising water tables and the loss of species of immeasurable value. The extinction debt in the sheep wheat belt is huge. Some ecologists are predicting the extinction of up to 50% of the woodland birds (Seddon et al. 2001, Reid, J.W. 2000). Loss of plant species due to salinity is also predicted to increase dramatically and many small mammals are already extinct or threatened. The medium rainfall woodlands that remain are some of the rarest and most vulnerable vegetation communities in Australia (Hobbs and Yates 2000).

Assuming that plantations start to play a bigger role in the medium and lower rainfall agricultural landscapes those designing and siting them will confront many issues with regard to the relationships to existing vegetation. New, more sensitive approaches to designing plantations are required that are capable of protecting existing environmental assets whilst restoring the wider landscape from degradation.

Planning and priority setting tools such as salinity mapping and biodiversity benefits are being developed that will increase access to detailed information both for the private and public sectors. Spatially explicit information obtained by such planning tools is useful to assess technical and other aspects of individual projects and sites.

4.7.3 Lowering costs of revegetation/ reforestation

Increasing vegetation cover is a recognised priority for much of the Murray Darling Basin (MDBC 2002, MDBC & CSIRO 2002, Nambiar et al. 2000). Any rudimentary financial modelling demonstrates the importance of cost-effective revegetation, especially where there are limited prospects of commercial outcomes. Further innovation in reforestation is required to develop low cost, low risk reforestation techniques suited to the range of conditions. For example, in the Goulburn Broken Catchment there are over 30,000 ha of cleared land over 18 degrees slope and above 700mm rainfall (Alexandra & Associates 2002). This is clearly unsuited to traditional plantation establishment techniques. More R&D should focus on opportunities such as: improving direct seeding in arable landscapes; mixing direct seeding of pioneer species with precision planting of preferred plantation species in alternate rows or blocks; improving techniques for enhancing natural regeneration; aerial seeding of steeper slopes; and aerial “bombardment” of seedlings using spear-tubes technology.

4.7.4 Facilitating investment where its needed

The issue is that trees need to be planted in specific areas to obtain the required environmental benefits. Understanding of this complexity has brought us to the point where, from an environmental perspective, it is now recognised that not all trees are “good” trees. (Buffier and Allen 2002, p.viii.)

It is understood that if agroforestry is to be used to address environmental problems the industry must be adapted to encourage development in low to medium rainfall areas. Indeed much of the JVAP research focuses on achieving this goal (Buffier and Allen 2002). It is recognised however that taxation as an incentive measure is relatively blunt and more complex mechanisms such as described in this paper are necessary if forestry is to be encouraged into specific areas.

4.8 New markets for multi-purpose forestry

Despite significant progress made overseas, relatively little attention has been given in Australia to the application of changing market institutions to address environmental and natural resource management. In effect, Australia’s approach to environmental policy has been to ‘fence-off’ the environment from the remainder of the economy, and hence, limit its exposure to the organizing influences of market processes. (Chaudhri 2003, p.6.)

The configuration of markets or “market rules” can have a significant impact on the level and social, environmental and economic outcomes of investment. Adverse market conditions can “lead to socially ‘sub-optimum’ levels of private investment, or to investment in unsustainable forest management and timber mining as opposed to sustainable forest management” (Gregerson & Contreras, 2001, p.15). In recognition of this Chaudhri (2003) also notes that markets are generally effective mechanisms for encouraging “exploitation activities”, but somewhat less adequate if conservation is the goal. For example landholders are given clear market signals in the form of financial returns for agricultural production if they clear their land, but in most cases, gain no fiscal reward for conserving native vegetation.

The current market “rules” limit substantial investment in reforestation to those areas deemed commercial by forestry companies –north western Tasmania, South Western Victoria and SW Western Australia. In the medium and low rainfall regions, growth rates are deemed too slow and risks too high for intensive plantation forestry. Without a market for the environmental goods and services delivered by forestry, there is limited opportunity for expanding reforestation into these areas. The development of these markets requires a paradigm shift in the way policy makers, industry and landholders view landscapes and the products extracted from them.

Fortunately markets demonstrate an extraordinary capacity to value a wide variety of intangibles including brand names, patents, and R&D in process. The key challenge is to measure the value in monetary terms of the environmental services provided by any particular farm forestry project (Binning et al. 2002, p.3.) There has been some progress in this as ecosystem services are beginning to enter the vocabulary of policy makers and carbon markets are taking off. The design of a large scale investment vehicle that could capture economic benefits of ecosystem services is necessary (Brand 2001). This would help to create diverse regional economies while achieving NRM goals.

However, it is unrealistic to assume that this will occur spontaneously and therefore it may be necessary to cultivate a variety of mechanisms or strategies. For instance there is most likely a need for an intermediary body of some sort to broker deals between investors and landholders, or NRM agencies and provide equity finance (Sammon and Thomson 2003). It is unsure whether this would be the best way to broker deals, however there is definitely a need for marketing, information sharing, risk analysis, and a streamlined administration especially during the infant stages of a market.

Uncertainty in technical areas such as species growth rates, timber production, salinity, and hydrology impacts impedes the confidence of both public and private sector investors. This lack of technically rigorous information demonstrates a clear need for ongoing R&D, plus the building of public and private sector capacity in forecasting the risks and returns arising from investment in multi-purpose reforestation.

4.9 Reform for ecosystem service markets

A further challenge is to link profitability with environmental goals. Offering an incentive to plant in areas for a specific environmental purpose ... is central to achieving sustainability. Commercialisation of agroforestry environmental services represents both a major challenge and a major opportunity. (Buffier and Allen 2002, p.1.)

Successful landscape change strategies are dependent upon, amongst other things, stimulation of the dynamic relationships between public policy processes and private enterprise decisions. A variety of incentives, mechanisms and policies could be used in conjunction with existing programs to maximise positive outcomes (Alexandra & Associates 2002).

Centralised policy reform will be necessary to create new industry structures and redefine property rights. However, such reforms are less acceptable in agriculture than in other natural resource sectors. Over the past decade there have been major national policy reforms in water resources management (Industry Commission 1992; COAG 1995; Smith 2003), fisheries and native forest management with resulting major structural changes to these industries (Mobbs 2003). In contrast, structural changes in dryland agriculture have been largely determined by “market forces” with a more ad hoc approach to intervention by Governments, including interventions which may be hindering adjustment such as some drought assistance which supports the “survival of the incompetent” (AFR 2004).

The fundamental difference between dryland agriculture and the other resources sectors is that dryland agriculture operates on the basis of well defined “private” property rights – freehold and various leasehold land tenures – with all the associated presumed rights.¹⁶ In contrast, water, fish stocks and native forests are predominantly publicly owned and managed resources to which access is regulated as per common property resources (Young and McCoy, 1995).

¹⁶ See LWA 2002 for a comprehensive overview of recent writings on the changing nature of natural resources property rights in Australia.

While Governments are increasingly attempting to introduce an approach to setting policy directions via regional targets for catchment health, to be effective these may eventually impinge directly on the nature of presumed land use rights, however this is unlikely unless these targets are linked to detailed spatially explicit plans which specify certain land uses or changes in land uses – e.g. revegetation.

One option for meeting these targets which is being explored is use of market based mechanisms (like Bushtender and Bush returns¹⁷) and by developing more large scale markets for ecosystems or environmental services (see below). However the markets are unlikely to develop without coherent and concerted policy reforms which clearly establish the property rights and the rights to trade – e.g. the exclusion of Australia from world trade in carbon credits.

Long-term carbon markets are likely to be the most significant stimulus to multi-purpose reforestation due to their ability to attract regular payments which increase the IRR for reforestation projects. A carbon register should be established to facilitate and monitor trade. The current Australian Government position on the Kyoto Protocol excludes forestry projects that achieve carbon sequestration from achieving returns from this potentially large and lucrative international market. This appears to be acting as a major disincentive to large scale revegetation.

4.9.1 Carbon trade

With the recent approval by the Russian parliament to ratify the Kyoto Protocol, it is inevitable that global trade in carbon will increase dramatically as companies and governments offset their emissions. Indeed “The Australian” newspaper reports high levels of activity in the market even before a sophisticated international framework is in place (Harvey 2004). The European Emissions Trading Scheme (ETS) commenced trading in January 2005, ensuring the EU becomes a carbon constrained economy.

Australia stands to benefit from a strong demand for carbon sequestration via plantations and reforestation. It is generally understood that even if the Federal government remains opposed to the Kyoto Protocol (while a hindrance) it will not prevent trade in carbon credits as State Governments and businesses are anticipated to participate independently in carbon markets once suitable arrangements can be established.

The Australian states are proposing to develop their own carbon trading systems although details are sketchy at this stage (The Age 2005). The message however is clear: this is an emerging market of massive potential for NRM in Australia.¹⁸

Carbon sequestration is the easiest of the potential ecosystem services to measure due to the global nature of the market, the standard characteristics of the commodity and the relative ease of its quantification.

4.9.2 Ecosystem services markets

“We are on the verge of a new era in which transparent, well regulated markets in ecosystem services are making conservation a strong business opportunity” –Jose-Maria Figueres, former president of Costa Rica and former Senior Managing Director of the World Economic Forum (www.ecosystemmarketplace.com).

¹⁷ For information on Bushtender see: <http://www.dse.vic.gov.au/dse/nrence.nsf> and for Bush Returns see: <http://www.gbcma.vic.gov.au>

¹⁸ For more information regarding the global carbon market see: www.co2e.com or www.ieta.org

Prospective markets in ecosystem services represent significant “win-win” opportunities for investors, businesses and landholders. For public agencies like CMA’s, they potentially offer a mechanism to encourage the ethic and practice of conservation and land stewardship on a large scale across private and public lands. Even in situations when Government agencies remain the sole or principal buyers of ecosystem services, on behalf of the public, there are opportunities to use markets and market-like mechanisms – tenders, auctions, and service contracts etc - to ensure that they are intelligent and effective purchases. Multi purpose forestry is one option for delivery changes in land use that provide increased ecosystem services.

In Australia there has been active investigation into policies that could support payment for the establishment of markets (or quasi markets) for environmental services derived from reforestation (see for example Alexandra and Hall 1998, Buffier and Allen 2002; Binning et al. 2001; Brand 2001; JVAP 2002, 2001; VCMC 2002; PFC 2003). By establishing an appropriate market structure and taxation regimes, local water authorities, tourism and fishing industries and downstream businesses could all be willing buyers of ecosystem services (Francis Grey pers. comm.).

Ecosystem services markets are being investigated by projects involving a range of CSIRO Divisions and other groups. The aim is to establish markets and encourage investment in ecosystem services. Case studies include the Goulburn Broken Catchment in Victoria, the Blackwood Basin Catchment in WA and the Murrumbidgee Catchment in NSW. These projects often go beyond forestry services to include a range of other approaches to valuing ecosystem services. For more information see: www.ecosystemsproject.org

Despite the lack of established markets for environmental services, it is worthwhile focusing on Governments becoming smarter purchasers of these services. Government incentive payments should be focused on explicit outcomes or outputs (e.g.. CO₂ sequestered, area regenerated/revegetated) rather than inputs, in order to encourage innovation and efficiency.

Market Based Instruments (MBIs) are being trialled in a number of projects to investigate ways in which the market can express detrimental environmental impacts. MBIs present significant opportunities for delivering cost effective NRM and aim to correct the failure of markets to address environmental issues. Projects such as the Commercial and Environmental Forestry project discussed under the “related initiatives” section of this report contribute significantly to revealing a market cost for delivering environmental services.

Another initiative, the Ecosystem marketplace, aimed at giving value to ecosystem services has been set up by the Katoomba Group. The web site attempts to provide accurate information on market values of specific ecosystem services. In this manner it aims to strengthen the market and ultimately the monetary value of these products. For more information see: www.ecosystemmarketplace.com

Governments need to clearly state which environmental benefits they are prepared to pay for and initiate structured processes of price discovery (e.g. tendering). This would encourage businesses to actively pursue environmental benefit contracts. With experience governments would become smarter purchasers of these services, and help the private sector to make better investment decisions on the type and locations of plantations, or other changes in land use, such as sponsoring natural regeneration.

4.10 Conclusion

There is vast potential for forestry to make substantial contributions to NRM and the provision of ecosystem services in Australia. For these opportunities to be realised it will require not only new knowledge but new ways of applying knowledge. That will involve institutional, technical and financial innovation.

5. Experience in the Goulburn Broken

This section includes two parts – firstly a brief history of reforestation initiatives used for NRM outcomes followed by the recent experience in the Goulburn Broken.

5.1 A brief history of reforestation for salinity control

In Australia in 2005 it is now generally accepted that significant reforestation is necessary for salinity mitigation; for protection of water resources and catchment health; and for enhancement of biodiversity in many agricultural regions in the South Eastern and South Western parts of the continent. In the last 30 years this has gone from being a fringe idea to part of the mainstream agenda.

Over these three decades there has been steadily increasing interest in large scale reforestation capable of producing forestry products and delivering environmental goods and services such as salinity mitigation and improved water quality (Oates 1983; Schofield et al. 1989; Reid and Wilson 1985; Alexandra 1989, 1991 and 1992; Prinsley 1991; PFC 2003).

5.1.1 SALT – Salting Action Liaison Team

In 1978 when Terry White, Brian Dowie, Alison Teese and Harold Beer formed the Salting Action Liaison Team (SALT) in Maryborough in Central Victoria, the idea of reforestation to achieve economic, social and environmental goals was a genuinely novel idea. This historical perspective provides a context in which to understand the possibilities for landscape change, and helps to clarify the need for projects such as those now occurring in Goulburn Broken project.

In the mid 1970s Terry White was alerted to the threat of salinity by Ernest “watershed” Jackson, while working as a community liaison officer for the Christian Community College in Maryborough. The job’s aim was to identify social and educational needs and appropriate responses. Ernest Jackson read an article in *The Age* about the College’s employment concerns and wrote to Terry suggesting that they should address salinity, advising him to read, as a starting point, the Hansard report of the Environment and Natural Resource Committee (ERNC) of the Victorian Parliament. Once alerted to the nature and the scale of the salinity problem and the need for action, Terry conceived of the idea of a major reforestation employment program inspired by the Roosevelt new deal Civilian Conservation Corps. His efforts led to the formation of SALT.

SALT’s stated aim was to bring “attention to salinity as a regional problem, and to explore ways for the community and government to come together in developing methods to control dryland salting.... to develop strategies for wise land use and to explore ways to extend the range of skills and job opportunities available in rural communities” (Oates 1983).

With explicit references to wise land use and job opportunities, SALT was looking to integrate social, environmental and economic goals. Today this might be summed up in bland bureaucratic language as “working to improve the triple bottom line” or “forming NRM partnerships to improve social, environmental and economic outcomes”, but at the time it was a truly innovative initiative that struggled for years, but eventually succeeded in getting Victorian Government recognition and financial support.

SALT successfully argued in “A Revegetation Strategy for the Loddon Campaspe” (Oates 1983) for a major regional reforestation initiative which included R&D, extension, demonstration, employment programs etc which engaged farmers, local and state government agencies and communities. The resulting regional revegetation program – Project Branchout – can be seen as a precursor to a lot of what has happened with rural revegetation since.

Approximately 20 years later, a series of salinity audits have revealed the scale of the problem (MDBC 2000 and NLWRA 2001). Salinity is definitely recognised as a regional problem by all levels of Australian Government with some 20 regions nominated as priorities under the National Action Plan for Salinity and Water Quality. Furthermore, support for community government partnerships has revolutionised land conservation policy and programs in Australia. Governments, community and industry have formed powerful coalitions aiming to integrate production and conservation goals (Campbell 1994; Marriot et al. 1999; Toyne 1992).

5.2 Exploring Landscape Change – the 2002 project

The Goulburn Broken Catchment requires between 100,000 to 300,000 hectares of the 850,000 hectares of cleared land to be revegetated in order to maintain acceptable salinity levels in the Goulburn River (M Cotter DSE per com). A study undertaken for the Goulburn Broken CMA investigated opportunities for accelerating landscape change in the Goulburn Broken Catchment via policy reform and private sector investment (Alexandra & Associates, 2002).

The GBCMA Landscape Change Project identified significant interest from both the private and public sectors in advancing arrangements for joint investment, yet considerable uncertainty as to how to fairly distribute risks, costs and benefits. This led to the identification of the need for further inquiry into Public Private Partnership arrangements and the successful bid to JVAP to initiate this current project.

The GBCMA Landscape Change Project explored land use change options, drivers, policy responses and investment opportunities (Alexandra & Associates, 2002). It focussed on a range of reforestation initiatives that addressed ecosystem services – salinity mitigation, catchment health, biodiversity conservation and carbon sequestration – as well as the production of forestry commodities such as timber, fibre and biofuels.

The GBCMA Landscape Change Project also scoped opportunities for establishing an investment partnership between superannuation funds, landholders, the GBCMA and the Victorian Government, as a way to finance the establishment and management of a notional 100,000 hectares of new forests (based on plantations and natural regeneration in the 500 to 800 mm average rainfall zones), over a 10 year period.

It was proposed that land use change and progress towards revegetation targets could be accelerated by implementing a major scheme based on, amongst other things, the following arrangements:

- Large scale financing of the scheme should be coupled with competitive tendering, project cost sharing and specific property agreements to deliver specified results at a particular location.
- Clear identification and publication by the CMA of their priority areas for revegetation or other land use change activities;
- Use of public sector NRM funds to leverage large scale private sector investments;
- The offering of long term contracts to private sector environmental service providers;
- Contribution of land and participation by land owners via a range of flexible mechanisms used to encourage uptake including lease, annuity and use of Victoria's forest rights legislation.
- Competitive contracts allocated to landholders and/or forestry companies to undertake cost-effective and innovative reforestation in those parts of the catchments that were identified as priority areas for generating catchment health outcomes; and
- Contract payments for public good outcomes – environmental services – and based on measurable performance.

5.3 Financing landscape change

As part of the 2002 study, a preliminary estimate of the total likely investment required was undertaken based on assumptions regarding growth rates of plantations species, opportunity cost of land and costs of establishment, depending on the type of forest/plantation deemed desirable on a range of sites (Alexandra & Associates, 2002). These variables, along with future values for carbon, timber and catchment health improvements were used to generate 24 different scenarios. Using the “reforestation calculator” it was determined that, to achieve 100,000 hectares of reforestation, something in the order of \$400 - \$600 million (2002 dollars) of total capital investment is required over a decade. Depending on the assumptions used, most scenarios generated a positive rate of return within 30 years using a discount rate of 6% (Alexandra & Associates, 2002).

The large scale, integrated reforestation proposed was based on the concept that private sector investments in forestry production and carbon sequestration could be coupled with government funding of public-good outcomes like salinity, habitat and water quality improvements. Coordination of various streams of existing Government investment (NAP, NHT, Greenhouse etc) was proposed as a means of establishing a pool of funds that could be used to leverage significant private investment. (For further information see for example Allen Consulting 2001)

The project found that in order to successfully combine public and private investments for catchment repair, a public policy framework is required to broker agreements that are fair and satisfactory to both public and private investors, complemented by processes that support negotiated agreements between catchment managers, landowners and reforestation companies/contractors. Furthermore, public sector agencies are in need of reforms which will allow public funds to be used as strategic investments capable of leveraging private sector funds (Allen 2001), rather than attempting to “buy” outcomes directly through NRM projects.

An investment model is needed which, if successful, would leverage public expenditure on rural environmental repair with substantial private investment (Alexandra & Associates 2002). In principle it is simple to assume that Catchment Management Authorities or other government agencies will be investing in positive environmental or catchment outcomes on behalf of the regional and national community in a cost effective and transparent fashion. Furthermore it is necessary to clearly separate the providers of capital (public or private investors) and the supplier of the goods or services. Investors may include: water authorities; investors in future forest products; carbon credit “speculators” and biomass fuel companies.

<u>Products/benefits</u>	<u>Potential Investors</u>
Biodiversity	Government
Water quality	Government
Reduced salt	Government
Future wood/firewood	Forest investors, processors
Carbon	carbon investors - buyers
Biomass energy	Energy companies

Government has a clear leadership role to play in that it has the capacity to generate private sector interest on the scale required. While in the longer term, government is likely to become a less substantial player, operating more by setting the “rules of the game”, than by being the purchasers of services or the facilitator of projects; initially it has a clear and definable role in establishing market confidence in investments which address issues of national significance.

The recent interest of the federal government in streamlining the PPP process (Morris 2005) offers significant opportunities to establish such an investment structure specifically for natural resource infrastructure.

The federal government should consider reforestation and other environmental initiatives in its current review of PPP investment structures and tax arrangements.

5.4 Future forestry scenario

The story below depicts a possible future scenario for the forestry and NRM sectors in Australia (Box 1). It is perhaps an optimistic proposal in the hope that it provides a vision of how things may be and stimulates positive action in the present NRM scenario.

Box 1 Future forestry time line – a scenario

2002 The Landscape Change project in the Goulburn-Broken offers promising opportunities and triggers more research into ways of financing broad scale land use change on private land. A number of projects investigate ways of valuing the services of sustainable forestry that have not been recognised by traditional markets but which provide real value to the community at large.

2006 An ad hoc working committee is formed consisting of senior executives from government, private investment organisations, and land and water managers. Investors show interest in sustainable forestry initiatives, and in a working sense it is possible to marry the desires of both private and public sectors. Negotiations occur against an exciting background of global activity in carbon trading to reduce greenhouse gases, significantly increasing the financial opportunities for large-scale forestry projects. It becomes apparent that an entrepreneurial body is necessary to broker deals between private investors and organisations such as CMAs in order to channel investment, and ensure that environmental problems are addressed to fulfil the duties of CMAs.

2010 Amidst a flurry of activity from the private sector increasing areas of land in the medium rainfall band is being reforested. CMAs are busy keeping up, attempting to focus investment where the health of the catchment most needs it. Markets for ecosystem services have become more developed, and the necessary measurements and knowledge of ecosystem processes are more refined. CMAs use this information to reward projects that contribute significantly to landscape health. As a result reforestation in many medium and low rainfall areas is seen as a valid land use and an attractive investment.

2015 Rural economies have changed quite dramatically in the past ten years, now encompassing a much broader range of activities. Many regions have diverse rural industries incorporating forestry, horticulture, and animal husbandry. These are operated by new “lateral” business that work across the landscape by structuring their businesses in ways to allow for efficient operations on many properties: new businesses that are less constrained by tenure. Intensive agriculture is focused in areas that support it, while much forestry and ecosystem service arrangements are more dominant in the less productive parts of the landscape. Changes in rural populations are meaning that more urban people own rural land either individually or in collectives, but engage the new businesses with their professional managers to manage it – diversification of income streams is seen as desirable.

2020 The landscape is now remarkably different from the beginning of the century. Many farmers earn a substantial part of their living by being land managers more generally, and maintaining essential ecosystem services for the community. Their stewardship is rewarded by companies and governments who under international law must offset any negative environmental impacts by investing in beneficial environmental activities. Australia remains a major exporter of agricultural goods mainly due to increased productivity from more healthy farming land.

2025 Land owners now have a suite of buyers for environmental services offered by forestry projects on their land including basically every company that has a tangible impact on the environment. Sustainable land management is now firmly enshrined in good economic management principles. Perhaps most importantly government policies now aim to accelerate the achievement of sustainability outcomes in all sectors.

5.5 Trialling landscape change

Since the 2002 work there have been two initiatives that aim to trial landscape change process in the GBCMA region. These are the bush returns project – a system where landholders tender to promote natural regeneration and the Commercial Environmental Forestry (CEF) project in the SW Goulburn which aims to develop and test an investment model capable of leveraging public environmental funding and private sector forestry investment. Both projects are described briefly below.

5.5.1 The Bush Returns project

This project offers money to landholders to implement management actions that contribute to revegetation across the catchment in order to address serious salinity problems, but also broader NRM goals. It aims to facilitate broad scale land use change by providing financial incentives to landholders to regenerate bushland. The first phase of the project was run in 2004 in the central area of the catchment around the Euroa area. This year the project will be accessible to landholders over the entire catchment with \$600,000 available for successful contracts.

Interested landholders are visited by the CMA for initial site assessment and together a management plan is developed. This forms the basis of a written tender which must be submitted by the landholder. The CMA assesses the bids received against criteria for significance of bushland and value for money. Successful bidders are invited to enter into a legally binding contract with the CMA for a period of 5 or 10 years, on in perpetuity with Trust for Nature. Yearly payments are provided to landholders, dependant on performance to the agreed goals.

This process appears to offer a cost effective method of achieving multiple NRM goals. As this is the first time such a project has been trialled in the area here will naturally be some teething problems. The CMA is attempting to identify and work with landholders through these problems. For instance most landholders will not have any experience in submitting tenders for management actions, and may be unsure as to how much to quote for the services. The CMA proposes to go over the tenders with unsuccessful landholders to clarify the reasons for the chosen tenders.

5.5.2 The Commercial Environmental Forestry project

The Commercial Environmental Forestry (CEF) project is trialling new investment models for forestry that aims to mitigate salinity and provide commercial returns. The project is funded by the Natural Heritage Trust (NHT) and has identified the southwest area of the Goulburn Broken Catchment to develop a pilot for targeted plantations. The pilot project aims to develop and test a model for public/ private investment in commercial forestry that achieves targeted environmental outcomes. Parties participating in the first phase of the project were the Goulburn Broken Catchment Management Authority (GBCMA), landholders in the Broadford area of the southwest Goulburn Broken and six forestry companies.

At the time of writing (autumn 2005) the project has not proceeded to plantation development in the first phase as the six interested forestry companies pulled out due to a number of reasons. It became clear that an ineffective tendering and contracting process was a major inhibiting factor. The lessons from this phase are expected to be applied to a new round of trials.

Important outcomes of the project include:

- The scale of forestry plantings is likely to be close to 20ha, and will be scattered across the trial area rather than concentrated in one area. This is due to the interest of landholders in the project, and the amount of suitable land for planting that was identified. While this suits the “Landscape mosaic” approach to revegetation favoured by the GBCMA, it reduces the commercial attractiveness to forestry companies.
- The most obvious issue with the trial was the complexity of the contractual arrangements. For instance there were four separate agreements required between the landholders, the CMA and forestry companies. As this is the first attempt at such a project it should be expected that contractual and administrative matters would prove a problem.
- An important issue is whether the amount willing to be paid by the public agency will be enough to make the planting commercially attractive to a forestry company. CSIRO attempted to establish a predicted IRR of the chosen sites with the idea that the difference between the forestry company’s threshold IRR would be paid by the CMA. It became apparent however that CSIRO was unable to offer financial advice and a commercial tender approach would be more appropriate to allow the forestry companies to reveal their willingness to invest.

One of the major issues identified by the project is the inability to accurately value ecosystem services. The trial attempted to resolve this by predicting the changes in the environmental services associated with afforestation of a given site and used a competitive bidding system to gain information on the cost of purchasing these environmental services. The project also attempts to develop tools to measure the environmental impacts of afforestation projects. Rather than an attempt to put a price on environmental services this process allows for cost-effective comparison between options such as revegetation.

The project assumes that forestry companies are seeking to expand into lower rainfall areas and are prepared to shoulder some of the risks associated with this (i.e. less predictable growth rates). In this context the role of the government is to help lessen these risks by paying for ecosystem services, rather than providing the driving force.

The project has highlighted three major practical issues which are also addressed throughout this paper. These include:

1. **Capacity to negotiate** – The GB CMA and other CMAs have limited experience in commercial negotiations of this kind. The process could stall between State and CMA negotiations unless roles and responsibilities are clarified.
2. **Capacity to pay** – The amount the CMA is willing to pay must be enough to make the concept commercially viable for forestry companies. Project funding will most likely need to be underwritten by the State, as the CMAs cannot guarantee funding over the life of an environmental forestry project, e.g. 30 years.
3. **Inter-government support** – Bi-partisan political support and innovative policy frameworks will increase opportunities for the concept. Institutional arrangements need to be sorted out differentiating the roles of project managers, investors etc.

The project results are promising given that the experimental nature of the trial provided no certainties. The project is now gearing up for a second round of pilot studies equipped with the knowledge from the first phase. The issues constraining joint investment in afforestation identified in the review of the first stage of the CEF project demonstrate the need for the PPP model to have strong institutional support.

A more detailed description of the CEF project is provided in Appendix 1.

5.5.3 Tenure and ownership patterns

Reforestation and natural regeneration of degraded agricultural land can generate a variety of social, economic and environmental benefits, however many of these are long term, and there is a strong perception that they compete with established land use industries.

There are several factors which affect the success of any land use change initiative. Types and spatial patterns of land tenure, for example, have an impact on what can be achieved. Much of the cleared land requiring reforestation is privately owned. This poses a greater problem for governments and land managers than there would be if the issues were predominantly based on public land. Many landowners feel quite legitimately that they must focus primarily on their business enterprises that generate cash flows. However, as there is an active market for land, ownership patterns are changing and will continue to do so. For many owners, full or part reforestation may be an attractive option.

The increasing tendency for urban people to purchase rural land indicates that it is seen as a potentially attractive investment or lifestyle asset. Furthermore, it is desirable to start conceiving of land-using businesses as operating independently from land ownership, and therefore local or regional afforestation businesses may operate over many titles.

5.6 Conclusion

This chapter demonstrates that CMAs have been actively exploring effective mechanisms to accelerate landscape change. However it is also apparent that there are substantial constraints limiting the scale and effectiveness of these endeavours. Furthermore CMAs have limited experience with large scale commercial contracts. It may be better to establish suitable arrangements for financing or negotiation at the State scale.

CMA's have limited experience in commercial negotiations on the scale of envisaged forestry or land use change contracts, thus investors may be wary. Roles and responsibilities within government need to be clarified to alleviate this problem, and it is foreseeable that State Treasury may be the best placed agency to undertake financial negotiations with support from forestry and NRM agencies.

6. Investment issues and opportunities

Reforestation investments have been hampered by the delay in cash flow. Most reforestation investment by the private sector has been short-term plantations for pulp and paper. The longer rotation, higher value species are often beyond the time scales of traditional investors.... Short rotation pulpwood forests create limited increases in carbon pools in the landscape. Shifting to longer rotation plantations for saw logs or veneer timbers can increase the carbon stock density significantly. Even more significant is a move towards new forests that will be managed under selection harvesting or conservation management regimes. From an investor perspective, the silvicultural regime that optimizes the flow of benefits from the forest and creates value through asset value appreciation will be preferred. (Brand 2001 p.5.)

6.1 Introduction

In this section we broadly outline some of the investment issues and opportunities. The nature of investment in forestry is changing. This section describes a range of initiatives that the timber industry, governments and investor and investment managers have been developing that collectively could contribute to more formalised public private partnerships.

Some of these trends and initiatives include:

- investment and interest in plantation forestry has been increasing
- the Victorian timber industry is keen to see greater production of sawlogs from plantations and is proposing innovative arrangements to fund this;
- The VCMC has been exploring ways of achieving land stewardship
- The PFC and the Victorian government have committed to a Private Forestry Strategy which includes a focus on joint production (environmental) forestry
- Corporate forestry companies have been actively exploring ecosystem service markets including carbon markets
- Some plantation forestry investment projects have adopted a strong and explicit commitment to environmental best practice
- The Victorian Government has been providing incentives for carbon sequestration
- The Australian States are proposing the creation of a carbon market
- Super funds such as Vicsuper have played an active role in exploring how they can invest in environment repair projects as part of their wider focus on sustainability

6.2 Plantation investment

There has been considerable growth in plantation forestry investment in Australia in the last decade. Much of this has been through ASX listed companies, such as Gunns, Great Southern Plantations and Integrated Tree Cropping, which offer managed investment schemes to investors. In addition there are MIS offered by non listed companies.

There are a wide range of considerations that determine the attractiveness of a project to investors (Table 3).

Table 3 What investors look for in forestry projects (adapted in part from Sammon & Thomson 2003, p.9.)

<u>Issues</u>	<u>Information required</u>
a. The nature of the project	Project details
b. Project management team	Quality and track record
c. Competitive returns	Relative to other
d. Positive industry outlook	View of the sector
e. Secure markets	Access and type of market arrangements
f. Adequate risk management of the project	Identification and management of a range of risks
g. Tax considerations	Nature of tax costs and benefits
h. Environmental outcomes	Environment costs and benefits

Using standard market theory, we can confidently assume that there is not any shortage of investment capital available, but rather the challenge is to increase the attractiveness of multi-purpose forests. Investigations into socially responsible investment (SRI) have shown that SRI funds managers would invest in forestry (like many investors) if a commercial rate of return could be generated. SRI investors also preferred arrangements that clarified environmental gains, operated under accreditation systems linked to EMS, reduced transaction costs and established conditions where there was a “more liquid market” (Buffier & Allen 2002).

There is substantial and growing interest in multi-purpose forestry, landscape change and ecosystem services amongst the capital markets and the “investment community”. Multi-purpose forestry may represent a significant investment opportunity for patient capital, particularly that which wants to be badged as “sustainability investment”. Significant investment in multi-purpose forestry could be achieved by “marrying” private and public sector investment and capacity through well-designed PPPs.

Typically many forestry projects generate below average returns and thus some form of financial incentive is necessary to encourage investment. Taxation as an incentive measure is relatively blunt and more complex mechanisms such as described in this paper are necessary if forestry is to be encouraged into specific areas; however the underlying constraint to investment is that:

...landscape change projects can only become a viable investment opportunity when they offer comparable returns with traditional investment opportunities. As these projects typically generate below-market returns, they need to have significant tax advantages to provide incentives for private investors. When all the necessary institutions and legal frameworks are in place, there are opportunities for intermediaries to bring together private investors and natural resource managers to produce beneficial outcomes for all stakeholders.” (Sammon & Thomson 2003, p.17.)

6.3 Attracting investors to multi-purpose forestry

Much investment in forestry has been in plantations for pulp that provide quicker turn around of cash flow and minimise the risk and uncertainty inherent in forestry investment (Brand 2001). However fast growing species generally have limited carbon stock density and assuming a growing carbon market, there is the potential to encourage longer-term investment in slower growing species.

Brand (2001, p.4) noted that, “most institutional investors in forestry are willing to accept an investment term of a decade or more. In that period there is generally a cash flow from the forests under management and, with good management, an appreciation in the value of the forest and underlying land resources”. He also stated that “risk and uncertainty are major factors in all forestry investments. Investors look for shorter term, locked-in cash flows, where uncertainty can

be avoided....rather than longer term investment in sustainable resource management” (Brand, 2001 p.3).

Payments for carbon sequestered by plantations have the potential to change the commercial dynamics of reforestation. It may make forestry more attractive as an investment, giving it an advantage over competing land uses, particularly in marginal agricultural areas.

There is a need to link together the forecasting of carbon stocks and timber revenue to gain an overall picture of cash flow, internal rates of return and asset values over time, based on assessing different scenarios of changing global circumstances. Government should provide information to support this kind of analysis, while the private sector continues to conduct its own analysis or risks and opportunities.

Until now, there have been limited secondary markets for immature plantations; therefore many Australian investment funds have not considered plantation investment due to the need to regularly revalue their assets. Instead they invested via listed forestry companies. Research now shows that some institutional investors are interested in investing in environmental repair projects if these could be packaged to form an investment class akin to infrastructure in terms of liquidity, risks and returns. To achieve this for the types of reforestation described in this project, would require the government to structure the arrangements so that they either assume some of the risk or supports suitable rates of generate return based on the projects environmental performance.

Superannuation funds especially represent an example of a type of investor that is interested in long term, secure projects, and are capable of providing the patient capital necessary. They show considerable interest in forestry projects and point out that they already invest in infrastructure projects and so reforestation could be seen as a sort of natural infrastructure (Bob Welsh pers. comm). Companies are also increasingly assessing the ecological sustainability and social soundness of investment projects not only the economic benefits (VicSuper 2004). Reforestation projects present these companies with a means to publicly show their commitment to sustainability. While investment in PPPs may eventually need to be listed for disclosure reasons, at present it is viable to investigate a range of financing options (Bob Welsh pers. comm.).

The management of the carbon pool offers alternative income to the investor and may alter the approaches taken by the plantation managers. For instance a comparison between the carbon market and wood prices may end up dictating whether or not a stand of forest is cut for timber or left in the ground to accumulate carbon Brand (2001) notes that *“individual stands will need to be integrated into overall carbon pools to achieve a forest management system that can optimize financial returns over time. ... in periods of high carbon prices and low timber prices, timber harvesting can be deferred and additional carbon benefits extracted. In periods where carbon prices are low and timber prices high, it would make commercial sense to increase harvesting ...to optimize the return to investors”* (Brand 2001 p.10).

Both governments and private sector investors have an interest in the future value of carbon accumulated through reforestation activities. These will need to be taken into account in calculating costs and revenues of projects.

To stimulate reforestation activity on a scale sufficient to have a measurable impact Governments can help create a favourable investment environment by:

- specifying exactly what environmental services will be paid for, and initiate competitive ways to discover their value (e.g. tendering etc) to become smarter purchasers of NRM repair services
- establishing bi-partisan political support for long-term projects focussed on multiple outcomes (This will help overcome the problems that can arise during negotiations with different levels of government.)
- clarifying the roles of Government agencies
- modelling the likely scale and impacts of reforestation on a region by region basis in terms of environment, employment and economic activity e.g.: impacts on landscapes, water, future timber industry, etc
- undertaking **analysis** which supports informed investment in emerging ecosystem services markets, and explores the willingness of the market to participate.

6.4 Victorian Government initiatives

Government programs and policies impact on the attractiveness of investment in number of ways, including by direct support e.g. grants and/or by signally to the market there is a need, opportunity or policy support for various kinds of activity.

The Victorian Government has a range of initiatives relevant to the focus of this project, in addition to NRM program referred to earlier. These include:

- Plantations for Greenhouse (P4G) as a part of the greenhouse Strategy
- The Land Stewardship project of the VCMC
- The Victorian Plantation Investment strategy

6.4.1 Plantations for Greenhouse (P4G)

Through the Victorian Greenhouse Strategy, the state government plans to encourage investment in carbon sinks via the establishment of sustainable forestry plantations. The project encourages plantations located in areas that maximise environmental benefits such as salinity mitigation and catchment health. These priority areas are identified by CMAs and attract high public cost share (up to \$500-700 per hectare). The project aims to stimulate cooperative partnerships between landholders, investors and the State Government to reduce the effects of greenhouse gases. The program aims to provide:

- \$1.9 million greenhouse funding over the next 3 years funding support for 1500 hectares of new carbon sink/sawlog plantations
- Up to \$700/ha public cost share
- 20% Carbon rights retained by the State Government
- All timber products owned by landowners
- Incentive for plantations located in priority zones for environmental benefits
- Removes over 800,000 tonnes carbon dioxide from the atmosphere
- Provides \$15 million income boost for rural Victoria on harvest

The P4G program encourages private investment in agroforestry and is a useful example of shared public and private investment. It demonstrates that the government are prepared to fund NRM projects of this sort, however it does not take the form of the partnerships envisaged in this PPP project, nor does it address the same scale of landscape. For more information see:

www.dpi.vic.gov.au/dpi/nrenfa.nsf

6.4.2 Land Stewardship

The VCMC has a research project known as the 'Land Stewardship' project, which covers a range of relevant issues including EMS, legislation etc. The project has been investigating options for

accelerating land use change, through exploring ecosystem markets, land retirement and may sponsor “alternative” land uses in drinking water catchments etc. For more information see: www.vcmc.vic.gov.au

In discussion on the Land Stewardship project the steering committee noted that innovation in methods and models of revegetation are required. To achieve the land stewardship goals there is a need to explore innovative forestry models, and not to be locked into the intensive silviculture models developed and adopted in higher rainfall regions like Gippsland and SW Victoria. Opportunities for innovation in operations, including direct seeding and natural regeneration, need further consideration. It was agreed that new operational strategies are needed to lower the costs of establishing plantations in medium and lower rainfall areas.

6.4.3 Plantation Investment Strategy

The Department of Primary Industry’s (DPI) program over four years aims to increase production of hard wood sawlog timber while maximising environmental services value. The program aims to enhance opportunities for emerging carbon and salinity trading markets by investigating the opportunities for plantations on private and public land. The situation of plantations so as to achieve the most positive outcomes for salinity and environmental problems is difficult and requires detailed planning. While the use of tendering process does not necessarily address this factor it is useful for resource allocation and price discovery. Land values also make forestry not viable in some areas. An approach that addresses this is to establish “Amenity Forestry” a form of forestry that is akin to “hobby farming”. It should be noted, and will hopefully become an outcome of this project, that Government needs to value environmental services effectively. For further information see: www.dpi.vic.gov.au

The Private Forestry Council (PFC) is keen to increase Joint Production Forestry (JPF) and use “more efficient NRM” as their marketing approach. The concept of JPF is more efficient than grants. However there is a need to establish an institutional framework capable of delivering a paradigm shift to achieve the necessary scale of change in the available time.

Other DPI initiatives aimed at increasing farm forestry are the Box Ironbark Firewood & Sawlog Farming Project and the West RFA sawlog farming project. Landholders can receive between \$300 to \$700 per hectare cost sharing with the government. Like the P4G initiative the government retains 20% of the carbon credits in return for technical knowledge and cost sharing. The projects also encourage investors without access to land to be involved. More information is available on the DPI website: www.dpi.vic.gov.au

6.5 Community and industry initiatives

In addition to the Government initiatives listed above the project looked into a number of community and business initiatives that demonstrate innovation in revegetation and forestry. These include:

6.5.1 Community initiatives

There are several past and present community and business initiatives that involve revegetation. For instance a current Landcare initiative, the “e-tree” project raised \$140,000 between April and mid-June by encouraging Computershare investors to be emailed information rather than receiving hard copies through the post. The project receives \$2 for every registration.

One corporate member of the “e-tree” project, BHP Billiton, also operates a number of wetlands programs throughout the country. The program aims to use cost effective revegetation techniques such as direct seeding of mixed species in order to produce an understorey as an effective form of ecosystem repair. There is a definite need to develop cheap options for revegetation which projects such as this highlight. Further to this, direct seeding has large possibilities as a revegetation technique within the box ironbark belt as it will generally not negatively impact on water use.

Projects such as these, point out that the community is already proactive about revegetation and that private investment for landscape change is coming in on top of this. The fact is that many different kinds of innovation are occurring throughout the country. What is needed is an institutional framework that supports these initiatives and directs the revegetation work to where it will be most effective. Government needs to be clear of its aims rather than paying for a particular forestry/plantation model and should be stimulating and supporting innovative approaches.

For examples of community and business initiatives see: www.ETree.com.au, www.landcareaustralia.com.au, or www.reviveourwetlands.net

6.5.2 VAFI: Expanding Victoria's Hardwood Sawlog Forest Estate

VAFI has expressed interest in the PPP project as it seeks to encourage debate around different investment structures for plantation development. While the use of innovative business models and tendering, such as Carbon Tender and Bush Tender will engage investors, their focus remains mainly on timber production. VAFI is interested in how tax dollars could be used to subsidise sawlog production instead of only woodchips, however it accepts that credible returns must be maintained if private investors are to be attracted. VAFI points out that there would be little interest in investing in long term plantation sawlog production if there were doubt about the security of the market (e.g. doubts that saw-millers would still exist in 20 years). VAFI argues that long term security of supply to mills and industry is therefore needed to remove uncertainty. Licences could be thought of as long term supply contracts. VAFI has proposed a levy as a way of capturing the value of resource security and having it invested in sawlog plantations. It should also be noted that VAFI expresses the view that plantation timber should be used complementary to native forests rather than as an alternative.

Box 2 gives a summary of the Victorian Association of Forest Industries Concept Paper, *Expanding Victoria's Hardwood Sawlog Forest Estate*, June 2004.

Box 2 Expanding Victoria's Hardwood Sawlog Forest Estate - Victorian Association of Forest Industries Concept Paper June 2004.

Industry is supportive of the creation of a forestry investment program to drive the development of hardwood sawlog plantations in Victoria. Government support exists for plantation development and the environmental benefits associated with plantations. Positive interest exists from retail and institutional investors.

The magnitude of the hardwood plantation viability gap varies in accordance with the costs of acquiring suitable land, the species that can be grown, and their growth and productivity.

Emerging research suggests yields can be improved significantly and rotation periods reduced through genetic improvements and better silvicultural management. A conservative approach is, at this stage, more appropriate for establishing a large plantation estate distributed across a wide range of site qualities, comprised of a range of species of varying growth potential and capable of producing a diversity of sawn wood characteristics. Further confirmation of yields and returns is desirable to confirm the findings of research into plantation management and processing improvements. Such research would support recommending substantial investments into plantations for sawlogs.

VAFI estimated returns by combining growth rates with estimated average land acquisition costs, assumed establishment and management costs and estimated future yields to determine the funding needed during the initial establishment phase to ensure commercial viability of plantation developments. (The VAFI model assumed an 8% IRR.)

While the largest viability gap (in \$ per hectare) occurs in the high land cost, high rainfall zones, significantly higher yields obtained from high rainfall zones produce the smallest viability gap in terms of sawlog production. Conversely, the viability gap (in \$ per cu.m sawlog) is highest for plantations established in low rainfall zones.

The bulk of the investment funds required to implement a major sawlog plantation program will need to be sought from retail and/or institutional investors, through processes such as regular public offers, providing opportunities for investment in specific plantation projects. A combination of funding from industry and government is also proposed to finance the viability gap in each project. The flow of funds provided would correspond to ongoing government and industry commitments to the plantation program.

VAFI proposed a system where by existing native forest hardwood licensees would pay an annual premium (levy) on sawlog royalties of, say, \$3 per cubic metre of licensed sawlog production into a plantation investment fund. In return, VAFI wants the Government to provide licensees with access to existing native forest with secure long-term sawlog licences of 20-plus year's plus duration equivalent in volume to the plantation sawlog production established through the investment fund. For example, to secure 100,000 cubic metres sawlog on long-term licences, industry would commit \$300,000 in annual premiums toward plantation development for the duration of the long-term licence. These premiums, added to investor and government funding, would support the development of sufficient plantation area providing a sustainable plantation sawlog yield of 100,000 cubic metres. And the long-term licence commitment provided by Government to harvesting of State forest resources will support the continuity of a productive and innovative sawmilling industry through to the period when plantation harvesting can commence.

As the level of industry funding proposed is unable to bridge the estimated viability gap for commercial sawlog plantations, government funding programs to support industry development and provide environmental services would also contribute towards sawlog plantation establishment, eliminating or significantly reducing the viability gap.

Both State and Federal Governments would continue to contribute towards the establishment and management of plantations in recognition of their long-term environmental benefits. Higher levels of funding would be provided to establish plantations in those areas requiring priority levels of environmental services relating to salinity, erosion and biodiversity.

Funding could be allocated through a tendering process as occurs with the Bush Tender and Carbon Tender programs, or other suitable market mechanisms. This would ensure that the sites selected for plantation development maximized the potential for both timber production and environmental benefits. Alternatively, government payments could be based on set rates for the anticipated environmental benefits generated by each proposed plantation development (gap payments).

Table 4 VAFI estimates of industry and government contributions needed to establish plantations providing 100,000 cu.m/yr sawlog yields

Rainfall zone	Rotation period	Plantation area established per year (1)	Viability gap (2)	Contributions required toward viability gap			
				Licensee Premiums		Environmental Services	
	years	ha	\$/ha	\$/ha (3)	\$/yr	\$/ha (4)	\$/yr
Leased Land							
low	50	1666	\$ 2,193	\$ 180	\$ 300,000	\$ 2,013	\$3.65M
moderate	30	741	\$ 2,575	\$ 405	\$ 300,000	\$ 2,170	\$1.61M
high	25	488	\$ 1,745	\$ 615	\$ 300,000	\$ 1,130	\$0.55M
Purchased Land							
low	50	1666	\$ 3,372	\$ 180	\$ 300,000	\$ 3,192	\$5.32M
moderate	30	741	\$ 4,256	\$ 405	\$ 300,000	\$ 3,851	\$2.85M
high	25	488	\$ 4,413	\$ 615	\$ 300,000	\$ 3,798	\$2.15M

Notes:

1. Area required to support sustainable plantation sawlog yield of 100,000 cubic metres (from Table 1).
2. Sawlog yield (from Table 1) multiplied by licensee contribution of \$3/cu.m.
3. Viability gap less licensee contribution.

The concept as outlined proposes that licenses over native forest sawlog resources be secured against an equivalent volume of plantation sawlog resource. If licenses could be secured against a lesser volume of plantation sawlog, licensee contributions would make up a larger proportion of the viability gap. For example, providing 50,000 cubic metres of plantation sawlog to secure 100,000 cubic metres of native forest sawlog would effectively double the impact of the licensee contributions per hectare. This would, in turn, reduce the required government contribution.

Current investor interest in plantation projects is primarily tax-driven, with 100% deductibility of establishment costs, management fees and interest expenses on investment loans. These tax advantages, together with the life span of 10-12 years for short-rotation pulp plantation investments provide the strongest interest for retail investors.

Because institutional investors are not generally able to access the tax advantages available to retail investors they will be more concerned with long-term yields and the capability of investors to exit the investment, usually within time horizons of 3-5 years. These issues are subject to actuarial scrutiny and must be carefully considered in developing any offers. Again, the long life span and lack of cash flows over the rotation period reduce the attractiveness of these projects. Superannuation funds may, however view the long-term secure nature of a sawlog forestry investment as a positive.

One option to improve a project's attractiveness to both retail and institutional investor groups could involve the marketing of sawlog plantation projects to both retail and institutional investors at different stages over a project's life. For example, the offer could be constructed to provide for an initial term of the investment to conclude at a specified period (minimum of 5 years) or, say, the completion of first thinning. The offer would initially be targeted at retail investors.

At the conclusion of this initial term, the Responsible Entity for the project would purchase and on-sell interests in the standing plantation to institutional investors at an agreed bond yield. This arrangement would have been previously disclosed in the initial offering. Prior agreements and/or options would also need to be set in place with specific institutional investors to purchase an interest in the project at a particular time.

For further information see: www.vafi.org.au

6.5.3 Discussion on the VAFI proposal

Forestry industries have been trying to gain support for greater resource security for a long time, however, this may be the first time they have attempted to get support by proposing a long term levy to create a fund for plantation development.

As the organisation representing the companies that are likely to be the buyers of the future sawlogs VAFI has alternative ways of encouraging investment in sawlog plantations. For example they could offer long term purchase contracts to future sawlog providers.

Also there are some dangers about the “viability gap” approach which looks at generating acceptable returns from known silviculture systems when perhaps what is most critical is having funding, policy and research which supports the adoption of innovative models.

Furthermore the recent introduction a new competitive sawlog pricing system, based on auctioning of parcels of public forest grown sawlogs aims to eliminate arbitrary pricing (Penna 2005) may change the financial viability of the of the kinds of plantations envisaged in the VAFI proposal.

6.5.4 Macquarie Forestry Investment with Greening Australia

Macquarie Bank. Macquarie has formed a partnership with Greening Australia to invest in high Blue gum plantations. The program is designed to take a pro-active approach to conservation management while still producing acceptable returns for investors. The company sees it as good business by tapping into a market need in environmentally conscious investors, while Greening Australia look for ways to sell salinity credits and other environmental services to extend the value of the plantations. As the primary focus for investors remains good returns, the partnership will work as long as its commercial viability is maintained. For further information see:

www.greeningaustralia.org.au or www.macquarie.com.au

6.5.5 Hancock Natural Resource Group

Hancock Natural Resource Group (HNRG) is an investment organisation that focuses on returns from forestry for its investors. Its timber division is the largest manager of timberland investments in the world, and in 2003 managed more than US \$2.8 billion in timberland assets (HTRG 2003). David Brand of HNRG notes that within Australia institutional investment is necessary because traditional timberlands have limited liquidity. Institutional investment has been unattractive in the past due to a number of reasons, however is important because governments are often unwilling to invest in reforestation.

Australia’s carbon market is likely to strengthen with time. Conservation planting would also become more and more attractive as carbon prices increased, which would assist environmental policy decisions. As a further attraction to the industry it is likely that wood could become a material of choice in a carbon constrained future, as it has lower embodied energy when compared to aluminium , concrete and steel. For further information contact: dbrand@hnrp.com.au

6.5.6 Conclusion

It’s clear from the initiatives and proposals summarised in this section that there is a wide range of policy initiatives and programmes focusing on forestry development that includes both commercial and environmental objectives. This project was not intended as a comprehensive review of forestry incentives but due to the case study approach we have profiled those initiatives encountered in Victoria. However it is reasonable to assume that comparable programmes exist in other states or through the NRM regions.

Governments already spend substantial amounts of money on NRM, mainly through large numbers of relatively small grants (e.g. NHT/NAP etc). In order to achieve NRM outcomes cost effectively, strategic projects should be funded which build capacity to leverage private investment through large scale investment projects engaging the capital markets, landholders, timber companies and CMAs.

The government incentives illustrate a willingness to facilitate or encourage certain types of forestry that meet the objectives of specific programmes. The private sector initiatives illustrate an increasing willingness to take on environmental responsibility as a way of differentiating forestry investments. The VAFI proposal demonstrates that the forest industries are seriously exploring ways of attracting increased investment into sawlog production.

PPPs or similar arrangements offer a framework for coordinating these interests and capabilities on larger scales.

7. Public Private Partnerships – a review

Leveraging private investments represents a major opportunity to generate the scale of activity required to improve catchment health and to sponsor employment, innovation and industry development. -Alexandra & Associates 2002, p.40.

7.1 Introduction and summary

There are important lessons to be gained from the experience of PPP in other sectors and nations that could be usefully applied to developing frameworks, processes and structures for multi-purpose reforestation investment arrangements in Australia. In particular these lessons can assist with answering the following important questions:

- What policies and institutions will support the establishment of viable and functioning markets?
- How will/can these markets be financed from both public and private spheres?
- How can reforestation on the scale required to address land and water degradation be facilitated and financed?
- What principles and negotiation arrangements are required for ensuring fair splits between public and private investments?
- How should respective shares in risks be determined?
- What arrangements will engender sufficient confidence of landholders and investors in long term environmental services contracts?

In reviewing the literature on the international experience in establishing Public Private Partnerships (PPPs) and recent literature on reforestation in Australia we asked:

- What are the implications of the international experience of PPPs for reforestation in Australia?
- What is the potential of PPP arrangements for multi-purpose reforestation in Australia?
- What examples, structures and principles are appropriate to reforestation?

Our review of the literature found that:

- There is a great deal of flexibility in how PPPs can be structured to accommodate the specific needs of projects (based on primarily on planning and negotiation);
- PPPs have been used in dozens of countries for a diverse range of projects including public housing, telecommunications, transport and water infrastructure etc;
- While PPPs can be structured in a wide variety of ways to achieve desired outcomes we found no examples of PPPs used for financing reforestation or other broad scale environmental restoration;
- There is generally a common-sense set of underlying principles that are used to inform PPP negotiations, but there are widely differing approaches adopted by Governments and multi lateral bodies in terms of the degrees of centralized control;
- A main difference in approaches is the amount of private control and risk sharing arrangements used in the projects; and
- That allocation and sharing of risks is a major focus of PPP planning and negotiation.

Based on the analysis of the literature we concluded that:

- PPPs offer scope for negotiating private and public investments in reforestation where there are public and private outcomes to be generated;
- There are no apparent reasons why they could not be used in Australia (or elsewhere) for reforestation; and
- Guidelines should be based on clear principles which permit flexibility in order to adapt to the various conditions of specific projects.

While PPPs have been used to fund many initiatives around the world, there are no examples supporting the kind of broad scale environmental repair proposed in this report.

7.2 Planning Processes for Developing PPPs

7.2.1 The Irish guidelines

Critical to executing a Public Private Partnership project is the assessment to ensure value for money for the public sector. This should not be seen as a single step but one that is carried through the life of the project (DELG undated). The first step is to provide the policy framework within which guidelines can be prepared. Guidance, on a sectoral basis, will be needed to inform both public and private sector interests. The next step is to create a series of standard contracts, briefs and other documentation to sustain the process. Finally, it will be necessary to ensure that projects are adequately resourced and staff properly trained (DELG undated). These tasks might be facilitated by creating a single statutory body that has the authority and specialist skills to undertake these tasks and to develop the experience, capacity and expertise to do them well, as discussed further in the paper.

There are a wide range of processes that impinge on the way in which projects are progressed using the Public Private Partnership approach. According to DELP these can be broken down into:

Project and Contract Management

An increased emphasis on project and contract management is required due to the fact that Public Private Partnership contracts are more complex and operate for longer periods than traditional contracts. For these reasons, it is essential that systems are put in place to ensure that projects are properly managed and contracts enforced. The DELG report sets out a procedure for the management of projects involving the appointment of public sector project and contract managers, the setting up of Steering Groups to run projects, the appointment of client advisers, the development of even closer links between the local and national authorities and their advisers and further development of existing project management techniques. Identification of a separate function of contract management reflects the fact that long-term operational contracts (20 to 25 years) are a common feature of the Public Private Partnership approach and present new managerial requirements for public authorities.

Procurement Options

The procedure to be used needs to be considered on a case by case basis and it should also be recognised that as the market matures the approach may change. It is strongly recommended that, even where the negotiated procedure is used, the Contracting Authorities puts as much detail into the tender documentation as possible rather than leaving matters open for negotiation.

Stakeholder Consultation

In general, stakeholder consultation should be:

- Extensive and involve all parties;
- Open and transparent, providing as much information as possible;
- Conducted at the earliest possible stage; and
- Comprehensive, covering all aspects of the project that are of interest to the stakeholders and not just statutory rights.

Participation and early involvement

For a Public Private Partnership programme to move forward smoothly and effectively it is essential that the private sector is fully informed about, and where possible involved in, the development of investment programs and project proposals (DELG undated). Early involvement of private sector interests in the development of project proposals is to be welcomed. The earlier in the design process that private companies become involved the greater the scope for use of new technologies and of developing innovative methods for delivering solutions. Mechanisms to encourage early involvement and engagement by private companies in the Public Private Partnership process should be set up involving improved information systems and market soundings.

Payment Mechanisms

One of the primary methods of allocating risk between the public sector and the private sector in a Public Private Partnership project is the payment mechanism. A well-structured payment mechanism will give the Contractor an incentive to meet or exceed the performance standards specified and will give the Contracting Authority specific remedies in the event that the Contractor fails to meet its obligations. A well-structured payment mechanism should also be acceptable to financiers on reasonable commercial terms and be easy to monitor. A variety of different elements can be used in isolation or in combination within the payment mechanism for a Public Private Partnership project and in general these elements include user charges, usage payments, availability payments and service related performance payments. (DELG undated)

Negotiations

Caplan et al. (2001) stress the importance of ensuring that impartial and accountable grievance mechanisms are available to all key stakeholder groups through the regulatory framework. They note that insufficient finance, time and dialogue is often given to analysis of the economic and social obstacles to project development and understanding the realistic options for applying regulatory frameworks. The advantage of a well-designed PPP arrangement is that these problems can be minimised through increased dialogue between stakeholders.

Good will in partnerships

A well-crafted agreement uses checks and balances to create co-dependence and transparency, while enabling all the parties involved to achieve their goals. Without the participation of any one of these actors it would not be possible to develop these projects on a partnership basis. This reality forces all of the participants to be receptive to the needs of fellow partners and to work together towards a joint solution and to work through new issues as they arise. (European Commission Directorate General 2003, p.34)

Legitimacy

Partnership is achieved by providing credibility for the private partner risking its money and legitimacy for the government sponsoring the project. Legitimacy is achieved by ensuring that partnership projects meet the needs of the paying public..... It is also achieved by rewarding for the successful negotiation of risk and providing the private partner with a reasonable return on its investment. However, if the rewards are too high then that legitimacy is undermined. Legitimacy is also undermined when investors are more interested in the profits derived from lucrative construction contracts rather than the successful operation of a concession itself once it is built. (European Commission Directorate General, 2003, p.35)

Statutory Process Risk

Another significant issue that must be addressed at an early stage in the development of a Public Private Partnership project is the extent to which statutory process risk will be allocated to the private sector. Where the public sector retains statutory process risk, the key requirement is for the retention of maximum flexibility for design innovation by avoiding unnecessary project detail. Where statutory process risk is transferred, it is necessary for the client to incorporate within the Output Specification as much background information on the planning and environmental context of the project as possible. This should ensure that the Contractor could efficiently implement the necessary procedures (DELG undated). Statutory risk can result form a wide range of legislative and regulative mechanism which must be addressed competently in the planning and implementation process. A range of these are listed below.

Other regulatory and legislative issues

A comprehensive range of regulatory and legislative issues need to addressed in negotiating successful PPPs. According to the EU guidelines (European Commission Directorate General

2003, p.38) regulatory and legislative issues that need to be investigated when developing a PPP include:

- Legal capacity of parties and legal requirement of the State to provide services;
- General legislation allowing or restricting private sector involvement particularly by foreign companies;
- Existence and legal basis of cost recovery mechanisms;
- Ability to provide guarantees;
- Property issues of land and infrastructure;
- EIA requirements;
- Land acquisition;
- Planning permission requirements;
- Licenses;
- Need for project specific statutory requirements;
- Potential conflict with Government Directives/policies;
- Administrative coordination;
- Dispute settlement provisions;
- Forms of possible state financial support;
- Competition and antitrust regulations;
- Potential impact of employment and social security laws;
- Public sector borrowing restrictions;
- Tax and accounting liabilities;
- Adequacy of selection and procurement procedures;
- Legislation governing project agreements and operational issues;
- Property law;
- Intellectual property law;
- Transfer of know-how and technologies; and
- Adequacy of oversight and monitoring provisions and authority to regulate services.

7.3 PPPs abroad

7.3.1 UK – Partnerships UK

Partnerships UK was established by the British Government as a joint venture between the Treasury and the private sector to develop the potential of public private partnerships (PPPs) across all sectors. Partnerships UK is the successor to the projects arm of the Treasury Taskforce and supports significant PPPs (including Wider Markets and PSRE sponsored PPPs) by assisting with business cases, identifying and negotiating with suitable partners and generally providing experienced commercial management support to the public sector. PPPs are seen by the Government to have a key role to play in enabling the public sector to make most efficient use of its assets (including Intellectual Property) and to derive best value for money from its engagement with the private sector (Hayward 2000).

Victoria has established a body responsible for the development of PPPs – Partnerships Victoria – based upon the British model. This organisation is described more fully in section 7.4.

7.3.2 Ireland

The facilitation of PPPs in Ireland is part of the National Development Plan (NDP) 2000-2006. Key drivers for the adoption of the Public Private Partnership approach in Ireland include the significant growth of the economy, the likely reductions in the levels of European funding available, the higher performance standards set by recent European legislation and the increasing pace of global competition (DELG undated). A Policy Framework has been developed which comprises an Overview Paper and fifteen Guidance Notes. The Policy Framework provides general contextual information on public private partnerships and specific procedural guidance in relation to the delivery of infrastructure projects using the Public Private Partnership approach. The use of PPPs in Ireland has been primarily for use in the roads, water and waste sectors.

The Guidance Notes focus upon PPP arrangements being delivered through specific contracts awarded through competition, rather than by means of joint venture arrangements between the public and private sector. As the market grows and matures different forms of Public Private Partnership, including joint ventures, are likely to be utilised having allowed time for the development of the necessary legislative framework.

This document identifies that the following legal issues need to be addressed:

- The legal basis for a local authority participating in a joint venture company with the private sector;
- Landlord and tenant issues regarding long term operational contracts; and
- The delegation of certain local authority powers to private service providers.

The Department of Finance, in line with the position taken in other countries, has indicated that it will not provide financial guarantees for Public Private Partnership contracts entered into by local authorities. The financial markets, on the other hand, require reassurance to accept financial commitments from entities other than the State, especially where such entities have limited income generation powers. It is in the interest of Central Authorities to ensure, insofar as is possible, that private funders have confidence in the competence and capacity of sub-sovereign bodies to engage fully in the PPP process. This issue is one of risk assessment and the cost associated with managing such risk.

Where sub-sovereign entities are entering into Public Private Partnership contracts, and financial assurances are being sought by the private sector, it is recommended that the Government should consider the level of assurance that it can give appropriate to the particular case.

The Irish experience has relevance to Australia in that it may be a CMA – sub-sovereign body with limited income powers - wishing to enter into a PPP.

7.3.3 USA

Each state within the US retains a great level of autonomy, particularly in government procurement and contractual practices. The result is a wide range of approaches to PPPs, with little or no guidance from the federal government. Accordingly, there is no equivalent of a Minister of Private Finance Initiatives at the US federal level.

American tax policy also generally favours the public sector for the financing of services and facilities. Local governments and states can issue bonds that are exempt from both federal and state taxes, and therefore can be offered at lower interest rates than generally available to the private sector. Even with all of these countering forces, PPPs have a growing place in meeting the needs of the general public.

Various forms of PPPs have been used throughout the entire history of the USA. The Transcontinental Railroad, built in the 1860s, is a classic example. Federal government owned lands served as part of the assets upon which private company stocks were issued for the funding of the railroad. As tracks were completed, the government deeded adjacent five square mile parcels of land to the private developers. These parcels were in turn developed by the privately owned railroads as farmland and towns, to provide the customer base for the railroad. An underutilized federal asset (the land) became the key to the private sector's ability to finance a major public works project.

Budget issues in the US

The current situation with governmental budgets is another major driving force. While far from unique to the United States, there is now an acute public sensitivity about the limitations of government financial resources. Massive surpluses of a few years ago at the state and federal level

have disappeared, while there is a growing awareness that many of the long term needs for infrastructure maintenance and development have been ignored for too long. As public demands for services and facilities continue to grow, and the treasuries at all levels of government are sorely tested, partnerships are often the most viable answer.

The most dominant area, both in number of projects and total dollar volume of business, is in water and wastewater facilities. In some locations, the private sector provides just the operations and maintenance of publicly owned facilities. Where new technologies and/or major capital requirements are involved, private companies can provide the full range of design-build-operation options. (Norment, 2002)

7.4 PPPs in Victoria

Partnerships Victoria was created by the Victorian government to create “partnerships between the Government and private businesses in which improved value for money is achieved by utilising the innovation capabilities and skills of both to deliver performance improvements and efficiency savings” (www.partnerships.vic.gov.au). It is based strongly upon the Partnerships UK (see section above) and focuses on the delivery of public infrastructure and ancillary services.

Partnerships Victoria has a well-developed website with an extensive amount of downloadable policy documentation and guidelines. These concepts could easily be applied to reforestation PPPs. To date this body, has focussed on built rather than natural infrastructure.

Lack of professional, governmental and institutional experience is an impediment to the potential for large-scale partnerships focused on revegetation.

7.4.1 Victoria's PPP Policy

box 3 summarises Victoria's approach to PPP's. It is based on extracts of the extensive documentation available from www.partnerships.vic.gov.au

BOX 3 – PPP Policy – Partnerships Victoria, 2000

SCOPE AND APPLICATION

The policy applies to the provision of public infrastructure and any related ancillary services which involve private investment or financing. The term 'infrastructure' can extend beyond physical assets to encompass major information technology procurements. In this context, 'related ancillary services' may encompass accommodation services arising out of the infrastructure, building-related services such as maintenance and some support services.

The *Partnerships Victoria* policy does not apply to the general procurement of services by the Government where public infrastructure is not being provided (e.g. professional consulting services and printing services).

The policy applies to public infrastructure projects when the present value of payments to be made by the Government (and/or by consumers of a service) will exceed \$10 million during the period of a partnership.

The policy applies to all such projects entered into by Government departments, unless a specific Government decision advises that other provisions will apply. Application of the policy to the provision of infrastructure by a Government Business Enterprise shall be determined, on a project by project basis, following consideration by the responsible Minister of the business plan of the Government Business Enterprise.

NATURE OF PARTNERSHIP PROJECTS (Partnerships Victoria, 2000, pg 5)

Partnership projects bring public and private parties together for long-term mutual benefit. Partnerships focus on ensuring improved services to the community through the provision of better infrastructure.

Partnerships entered into under the *Partnerships Victoria* policy can take a wide variety of forms. However, there is no single preferred form. These projects generally have a number of common features:

- Outputs clearly specified including measurable performance standards;
- The Government making payments only upon delivery of the specified services, to the required standards;
- A relatively long-term commitment, with the term depending upon the nature of the project;
- One or more private parties, fully accountable to the Government for the delivery of the specified services;
- Risk allocation between the parties being clear and enforceable, with consequential financial outcomes;
- Clear articulation of the Government's responsibilities, with respect to the monitoring of outcomes; and
- Inclusion of mechanisms for delivering ongoing value for money throughout the life of the project.

These features could be consolidated into the list of characteristics below I think

The clear specification of required outputs allows bidders to compete in devising creative means of delivering those outputs, with a view to reducing costs. Thus, the Government will limit detailed specification of inputs, such as the design of infrastructure, or of the means by which outputs are to be generated. Likewise, the Government will be open to solutions by which proponents may derive other additional benefit or revenue from infrastructure, subject to the value for money and public interest tests.

PRACTITIONER'S GUIDE (Partnerships Victoria 2001, p.4)

What is a partnership?

A *Partnerships Victoria* project results in a contract for a private party to deliver public infrastructure-based services. The policy does not cover outsourcing or other service delivery arrangements where no capital investment is required.

A common misconception regarding *Partnerships Victoria* contracts is that they are principally about private sector financing of public infrastructure. *Partnerships Victoria* is better described as being about achieving outputs by creating a business opportunity for the private sector, while providing value for money to government, in the public interest.

Projects with the following key characteristics are likely *Partnerships Victoria* candidates:

- **Scale.** *Partnerships Victoria* projects have a contract value equal to at least \$10 million (in net present cost terms);
- **Measurable service outputs.** Government requirements can be expressed and measured in output terms. Payment mechanisms are generally structured around these output specifications to provide incentives for achieving key performance indicators;
- **Non-core services.** Contracts are likely to include a requirement for a range of services to be delivered, including accommodation availability, information technology outputs and many other services. However, *Partnerships Victoria* contracts do not include delivery of core government services — those services where it is in the public interest that government retains direct control (for example, police, public system teaching and judiciary);
- **Risk transfer.** A *Partnerships Victoria* project needs to be structured to achieve optimal risk allocation. Value for money is a key driver of the policy and if sufficient risk cannot be transferred to private parties, it is likely that a *Partnerships Victoria* approach will not deliver value for money;

- Long term. Contracts tend to be long-term (up to 30 years or more), and reflect an acceptance of whole-of-life cycle costing risk by the private party. Arrangements are governed by a well drafted and binding contract. Hence it is important that the nature of the service is such that government is able to take a long-term view of the service requirements and can identify private parties who demonstrate an ability to deliver and to work effectively with government over an extended period;
- Innovation. The project is sufficiently complex or otherwise allows innovative solutions; and
- Market appetite. The project creates a genuine business opportunity which is likely to attract a sufficient number of private parties and create an effective and competitive bidding process.

The presence of these characteristics will not always mean that *Partnerships Victoria* is a viable option. However, where they are present, *Partnerships Victoria* options will be properly considered. There will be an assessment of the effectiveness of the investigation of *Partnerships Victoria* options during the Budget approval process.

Practical application of the policy

In practice, the decision as to whether or not a service should be delivered as a Partnerships Victoria project depends on three core questions:

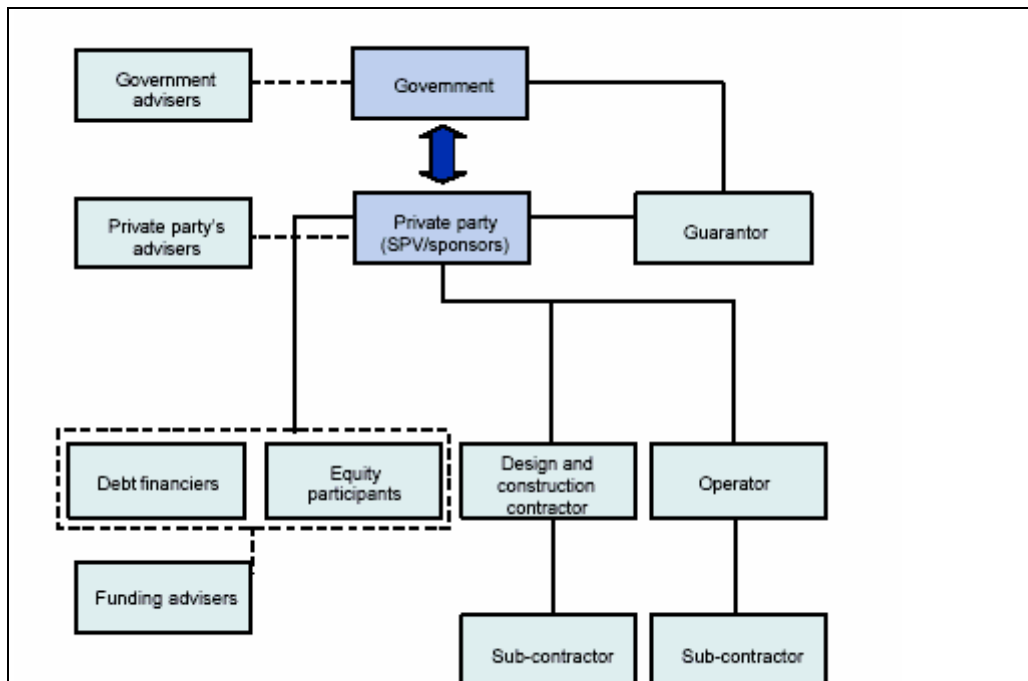
- (i) which (if any) part or parts of the proposed service is a service which government itself should deliver to its citizens? (the core services question);
- (ii) for all other aspects of the service and supporting physical infrastructure, what is the project model that delivers the best value for money? (the value for money question); and
- (iii) do the outcomes of the value for money question satisfy the public interest criteria articulated in the policy? If not, can the public interest criteria be satisfied by either building safeguards into the contract or through regulatory measures (and at what cost), or should the project be reconceived to 'reserve' further areas of service for provision directly by government? (the public interest question).

Value for money is maximised by allocating risk optimally. In very general terms, this means allocating each risk to the party best able to manage that risk. In theory, this reduces individual risk premiums and the overall cost of the project, because the party in the best position to manage a particular risk should be able to do so at the lowest price. (Pg 5)

In practice, the risk allocation in Partnerships Victoria projects is made somewhat more complex by the requirement of value for money. This means that government may agree to assume some risks which the private party is less well placed to manage (and consequently would charge a higher price to assume). (Pg 8)

A consortium of private sector parties is likely to include debt financiers (often in a syndicate arranged through a bank), equity investors/sponsors (who invest in the fortunes of the project and are therefore exposed to both the 'upside' and 'downside' risks), a design and/or construction contractor, and the operators. The following is a configuration of a typical consortium and its relationship with government and government's advisers. (Pg 11)

Figure 2 Typical Private Sector Consortium



There is a strong preference under *Partnerships Victoria* for government to contract with a single party which is fully accountable to government for all contracted services. From a government point of view, risk allocation is most effective if there is a 'whole of cycle' contract with a single private party, to give that party the strongest possible incentive to ensure that the design and construction phase converts into a highly effective operation. However, Figure 4 illustrates the possible complexity of the private party and the differing interests that may underlie its objectives in negotiation. (Pg 12)

Generally speaking, private parties take on risks if they can be appropriately priced, managed and mitigated. As discussed in Chapter 6 (Risk mitigation), this often involves transferring the risk to a third party, by way of sub-contract or insurance. For example, although there is a risk that an innovative design for a project may not be suitable for the designated purpose, that risk may be partly mitigated by appointing an experienced (and insured) designer. The private party then accepts the financial consequences of the risk, provided it can earn a commensurate return for accepting them.

The private party's uneasiness in taking these types of risks becomes more acute when the risk is not within its control. In such cases, it may be possible to change the nature of the risk or the scope of the project so that the private party can better take the risk on. Alternatively, if this cannot be done, it may well be more cost-effective for government to take back the risk and reduce the costs of financing the project.

It is clear from the *Partnerships Victoria* Policy (2000) that the Government's intended focus is infrastructure and infrastructure-related service provision. This should not be seen as an insurmountable obstacle to the consideration of using PPPs for reforestation, so long as the project's role can be defined as restoring or maintaining natural infrastructure (catchments) and/or the delivery of ecosystem services.

7.4.2 Creating specialist authorities to negotiate PPPs

Given the complexity and specialist skills required in dealing with PPPs it makes sense to develop and locate these skills within a dedicated authority. As stated above, drawing on the example of NSW SEDA, the establishment of dedicated authorities is often a useful way to achieve change. This is reinforced by the EU Guidelines, which state:

One of the most effective steps ... governments can take to support successful infrastructure partnerships is the establishment of special-purpose authorities charged with overseeing their implementation (European Commission Directorate General 2003, p.34).

In Victoria, Partnerships Victoria is a dedicated authority overseeing PPPs. It was established to perform a role similar to that of the UK's "Partnerships UK".

This concept presents significant opportunities for funding reforestation in Australia (Victoria), and may require reinvigorating the idea of establishing a "Vegetation Bank" or some kind of a statutory corporation such as the "Victorian Reforestation Corporation" (VRC) or "New Forestry Agency" to fund and broker deals. Such an initiative could be a "project" of the existing specialist Branch of Treasury – Partnerships Victoria, or alternatively a dedicated statutory body could be established to act as an intermediary between public and private interests. The roles and functions are discussed in Box 4.

The costs and benefits of establishing a special purpose statutory authority charged with overseeing implementation of multi-purpose reforestation should be compared with an existing authority such as Sustainability Victoria becoming responsible for brokering deals etc. In the event that there is a responsible authority or special purpose fund, project investment guidelines should be developed which are based on clear principles which permit sufficient flexibility to adapt to a range of circumstances.

BOX 4 – A Victorian Reforestation Corporation

Assuming a dedicated entity such as the "Victorian Reforestation Corporation" (VRC) is created it could have several functions:

- To identify and negotiate with investors;
- To identify and negotiate with landholders;
- To determine cost and risk sharing between public and private stakeholders for each project; and
- To develop contracts for PPP arrangements.

The identification of priority land for reforestation could be undertaken by the CMAs, local or State governments or could be the role of proponents and of the intermediary company. Contractors would carry out the reforestation operations. Contracts would be based on fair estimations of the split between public and private costs and benefits.

Taking into account the EU advice offered above, the development of the role and functions of an intermediary company such as the VRC should be undertaken through negotiation with the relevant stakeholders. Early involvement of stakeholders in the design of the arrangements will maximise the initiative's likelihood of smooth and successful implementation.

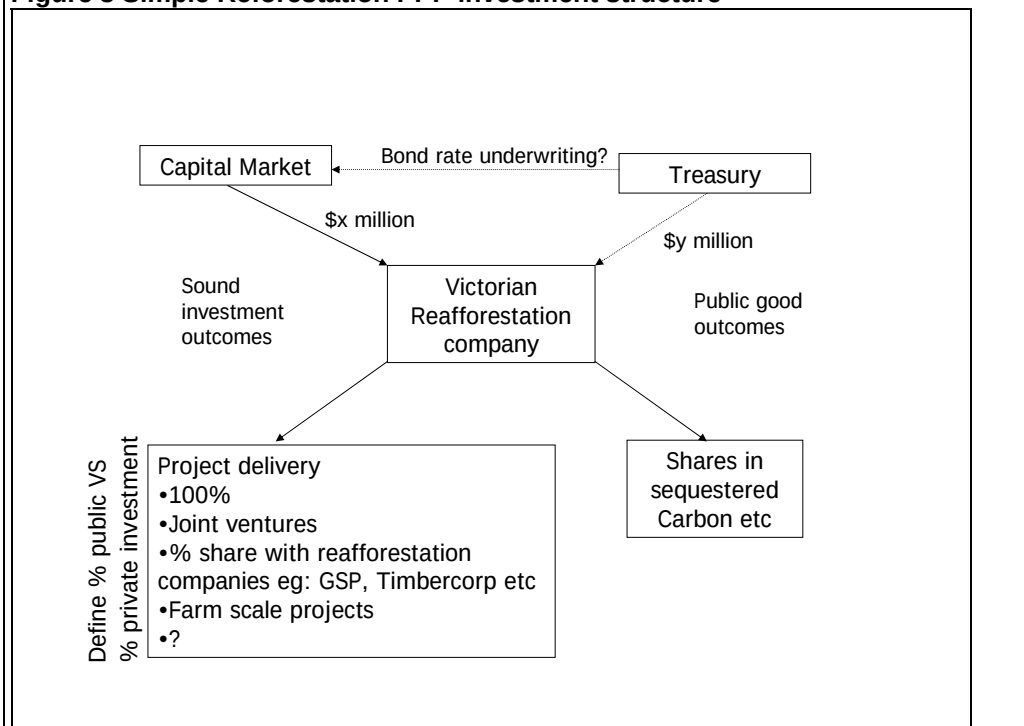
It is not yet determined precisely the roles and functions but a reforestation investment corporation may act in a number of capacities including:

- Acting as a funding pool, coordinating and sourcing funds from new and existing public and private sector investors, actively seeking further funding for expansion of the initiative;
- Acting as a project manager, overseeing the reforestation projects that the PPP makes possible, including the hiring of forestry contractors if necessary, the sale of products and collection and distribution of revenue;
- Identifying priority areas for the initiative in conjunction with CMAs, government agencies etc that are already mapping these;

- It could consolidate and apply knowledge generated from practical experience and R&D undertaken by other bodies;
- It could be responsible for the collection and sale of rights to harvest timber and be responsible for bundling and trading carbon credits;

Figure 3 below, provides an example of a basic investment structure for an intermediary company responsible for driving the reforestation PPP process. Further detail on this concept can be found in Alexandra & Associates (2002).

Figure 3 Simple Reforestation PPP investment structure



7.4.3 Conclusion

PPPs may offer a cost effective method for delivering efficient NRM outcomes in Australia. The established frameworks and guidelines for PPP arrangements appear suitable to incorporate reforestation projects should they be regarded as a form of infrastructure renewal or maintenance. The opportunities for advancing landscape change are encouraging and deserve further policy attention.

Glossary of terms

Afforestation – the conversion of bare or cultivated land into forest.

Ecosystem services – the functions of ecosystems that sustain or fulfil human life. For example water purification, pollination, biological breakdown and recycling of wastes, maintenance and renewal of genetic resources.

Environmental forestry – forestry systems providing economic and environmental benefits.

Landscape change – the deliberate beneficial changes to landscapes.

Multi- purpose forestry – forestry established and managed for multiple purposes, including production of goods such as timber and fibre; and production of ecosystem services such as landscape and catchment benefits; sequestration of carbon; provision of habitat; riparian buffers.

Public Sector Comparator – an analytic tool to guide value for money evaluations and for risk management and contractual negotiations. It seeks to establish a “base case” of what public sector provision of the project might look like and cost (Vic PPP review section 4.8).

Reforestation – conversion of land that was formerly forested into forest.

Revegetation – to vegetate anew.

Tri-sector partnerships – are strategic partnerships involving business, government and civil society that may present a successful new approach for the development of communities around the world. (Caplan et al. 2001, p 11.)

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Appendix 1 Commercial Environmental Forestry – an Overview

(extract from B. Moran, DAFF)

Introduction

The Commercial Environmental Forestry Program (CEFP) aims to develop a forestry investment model to address salinity in priority regions across Australia. The model, if successful will deliver profitable commercial and cost-effective environmental outcomes at a landscape scale.

While targeted forestry has been proposed as a technically effective and socially acceptable option for salinity management in the 500–800 mm mean annual rainfall zone, less than 6 percent of plantations in the Murray Darling Basin are located in this zone where plantations are most likely to deliver environmental benefits (Keenan *et al.* 2004). This weak overlap between plantation location and salinity occurrence is largely determined by the lower growth rates and poor economics of plantations in lower rainfall zones. Unless commercial returns and acceptable levels of commercial risk can be demonstrated, farmers or other investors are unlikely to undertake tree planting at a scale sufficient to address salinity problems.

The CEFP aims to improve the economics of low to medium rainfall forestry by:

- co-ordinating existing research and undertaking new research to improve the feasibility of forestry in the low to medium rainfall zone;
- identifying the overlap of those areas where forestry growth rates are close to commercial and where salinity benefits can be achieved while protecting water resources;
- developing a forestry investment model whereby regional authorities can purchase the predicted environmental services of targeted plantations. If successful these public investments will, by augmenting the traditional income from wood-flows, direct plantations to areas where they will deliver environmental benefits; and
- facilitating an auction process whereby private investors can bid for public co-investment in plantation projects in areas selected by regional authorities.

The CEFP is a three-year program funded primarily by the Natural Heritage Trust and CSIRO. The Program is a collaboration of the Australian Government Department of Agriculture, Fisheries and Forestry (DAFF), CSIRO, the Victorian State Government Department of Primary Industries, Goulburn Broken Catchment Management Authority, the National Association of Forestry Industries and the Murray Darling Basin Commission.

National Action Plan for Salinity and Water Quality (NAP)

The NAP focuses on 21 priority regions where salinity is a major hazard. Action plans to improve regional water-quality, salinity and biodiversity are being developed by local communities in these priority regions. Governments have committed major funds to support accredited action plans as detailed in Regional Catchment Investment Plans (RCIPs).

The CEFP aims to assist regional groups such as Catchment Management Authorities (CMAs) as well as private investors such as landholders and third party fund managers to co-operatively develop woody re-vegetation initiatives for consideration in RCIPs. The inclusion of afforestation projects in RCIPs requires that these projects can be demonstrated to cost-effectively contribute to catchment objectives. A major task in the CEFP, therefore, is the development of a toolbox that will assist catchment managers in assessing re-vegetation proposals. This toolbox will enable CMAs to determine the predicted environmental outcomes and financial costs of proposals, thus allowing a comparison of cost-effectiveness.

Why Forestry?

The mobilisation of salt from cleared agricultural land due to rising water tables poses a major threat to water quality health in the Murray Darling system (Murray-Darling Basin Ministerial Council. 2001). While engineering solutions can be a practical and cost-effective response in irrigation areas where salt loads are concentrated and suitable sites are available, they cannot be applied in upland areas where salt is dispersed and mobilised across the landscape. In these areas afforestation is the only tool currently available that is likely to deliver significant results. In the longer term, land use change to perennial vegetation is a sustainable management option that directly tackles rising water tables, the primary cause of salt mobilisation. This was recognised by the Murray Darling Basin Ministerial Council in their agreed recommendation that 10 ECs of salinity credits be generated from land use change actions in the valleys (Murray Darling Basin Ministerial Council 2002).

Commercial forestry can, by diversifying farm incomes, contribute to the long-term economic sustainability of farm enterprises and thus offset real or perceived opportunity costs associated with land use change. High up-front costs, long rotation lengths and negative cash flow profiles tend, however, to inhibit landowner uptake. Off-farm investment is therefore critical to achieving land use change on a significant scale.

In regard to salinity mitigation, a significant effect is one that leads to a change of 0.1 ECs in average daily salinity at Morgan (Murray-Darling Basin Ministerial Council. 2001). In the south-west Goulburn, thousands of hectares of afforestation would be required to produce such an effect. It is unlikely that such change could be achieved without commercial drivers.

Because farm forestry is a business, landholders and other investors have an interest in managing and maintaining that business in the long term. This interest in commercial objectives will also support the desired NRM outcomes. This may be contrasted with non-commercial re-vegetation activities where on-going involvement may be minimal and the management of risks such as fire and weeds is unlikely to be justified within the farm budget.

Pilot Project

While the Program is of national significance, it is initially focussed on a pilot project in the South West of the Goulburn Broken NAP priority catchment. This pilot is a three-year effort to conduct the research, prove the concept, stimulate some early tree plantings and promote the establishment of targeted afforestation as proposed in the Goulburn Broken Regional Catchment Strategy. If successful the model will then be available for application in other areas and will hopefully lead to the proliferation of CEF type projects across NAP priority catchments.

Preliminary analysis of site conditions was used to select a focus catchment for the development and testing of the investment framework. Primary criteria for the focus area were:

- that it was largely situated in a low-to-medium rainfall zone (400-800 mm/y);
- that reduced stream salinity could be expected rapidly enough to be taken into account in economic analysis (tentatively defined as 15 years);
- and that expected forest production rates would be sufficient to suggest commercial potential.

Additional criteria for accurate biophysical modelling were that the area coincided with one or more well defined catchments, that there was sufficient local knowledge and data on soils, groundwater flow systems, stream flow and water quality to allow model testing. Based on these criteria, State Agencies in Victoria and New South Wales proposed six catchments inside the Murray-Darling Basin for further analysis. For each catchment, the likely changes in catchment stream flow and salinity after 15 years, resulting from the afforestation of cleared agricultural land, were estimated. Total land area with sufficient forest production potential within the catchments was also identified.

The analysis indicated South West Goulburn as the catchment with the best potential for commercial environmental forestry. In this catchment a total of ca. 463 km² (12% of the area) appears to show good potential for a demonstration of Commercial Environmental Forestry.

Targeting

Forest plantations, in the majority of situations, provide a greater abundance of environmental services than do cleared agricultural lands. They can if poorly located, however, significantly reduce streamflow and further exacerbate the problem of over allocation of water resources. Protecting existing water allocations is of particular relevance in the Murray system of which the Goulburn River is a tributary. Targeting plantations to minimise these streamflow impacts is a major CEF program objective. Emerging research suggests that plantation design as well as location may also be important.

Program Outputs

CEF Program outputs include:

1. A Scenario Planning Investment Framework (SPIF) that is a framework that supports decision-making and investment by identifying those areas where trees will grow well while producing environmental benefits, taking into account regional NRM priorities¹⁹. It will also factor in transport distances and processing options. The prototype was reviewed in July 04 and the complete and verified version will be complete by July 06. The SPIF will integrate the commercial and environmental information being developed by the project into a computer based, spatially explicit format accessible to industry and agency professionals.
2. A new model for combining private investment in forestry with public investment in measured environmental services and the supporting institutional arrangements, working relationships and payment mechanisms.
3. An auction system and supporting arrangements to purchase sustainable land management activities.
4. A landscape mosaic design identifying areas suitable and not suitable for CEF considering a range of environmental (biodiversity, salinity, greenhouse), economic and social factors.
5. Products for implementation (establishment of forestry plantations) and extension, including guidelines for low rainfall farm forestry, a farm-planning tool that will consider reforestation within the context of other farm and landscape values and also options for supply of genetically improved germplasm matched to wood products.

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For more information see: www.ffp.csiro.au

¹⁹ In the Goulburn Broken Catchment these regional priorities support the development of a mosaic of land uses across the area.

Appendix 2 Types of PPP arrangements

The following is an extract from Ireland's Department of the Environment and Local Government's Guidance Note on Public Private Partnerships. It is a useful summary of the types of possible PPP arrangements (DELG 2000 pg 7; further information see also <http://www.ppp.gov.ie/faqs/>).

It is worth noting that in the European context PPPs have been used primarily for housing, construction and infrastructure projects, and not specifically to achieve broad-acre environmental outcomes²⁰. The principals are, however, transferable to the use of PPP arrangements for agroforestry and landuse change initiatives in that different functional relationships can be undertaken by the same of different parties. Also degrees of ownership and responsibility can be specified eg the concept of building can be seen as the planting phase, while operations are equivalent, and ownership may reside in a different entity to the builder/planter and/or the land owner, for example a public private joint venture.

Forms of Public Private Partnership

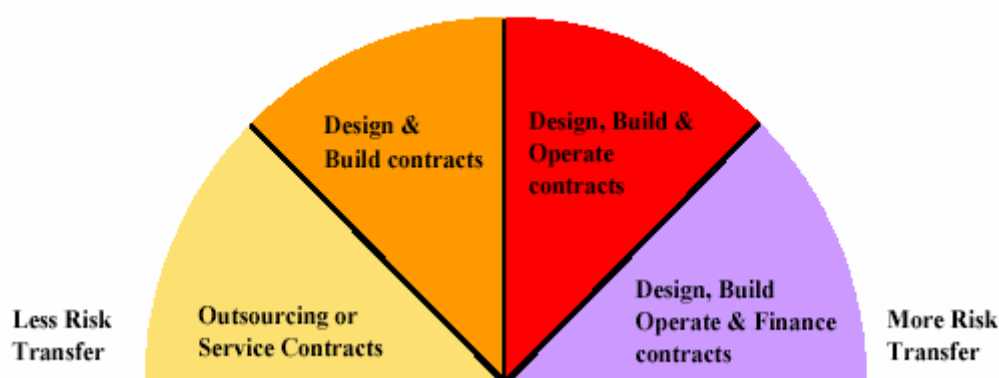
Public Private Partnerships are not well defined within international markets, and in their widest sense Public Private Partnerships embrace a variety of relationships. A simple definition is that they exist wherever the public sector and private sector work closely together with a common purpose. In terms of international experience to date, this commonly breaks down into the following areas:

- Long term contracts to supply services to the public sector;
- Contracts to sell services or assets from the public sector for private sector operation;
- Joint ventures to do either of these activities.

Contractual Forms

A wide range of contractual forms may be adopted by the public sector in establishing partnerships with the private sector, ranging from those where there is a great deal of public sector involvement to those where there is very little involvement. Generally, the spectrum of contractual options ranges from input based service and outsourcing contracts to output based Design, Build, Operate and Finance contracts or Concession contracts. The broad spectrum of contractual options is illustrated in the diagram below and discussed in the paragraphs that follow.

Figure 1: Contractual Forms of Public Private Partnerships



²⁰ In Europe agricultural subsidies are being used to try to maintain the countryside in a state which is considered socially desirable- eg more hedge rows etc

Outsourcing and Service Contracts are contractual relationships between public sector bodies and private sector contractors for the provision of one or more functions or services. Traditional service contracts involve the contracting out of activities such as catering and cleaning to achieve cost savings. More complex outsourcing contracts are associated with complex business functions or processes such as accounting and information systems. Outsourcing is characterised by the transfer of assets (facilities, staff and equipment) and a level of risk to the private sector contractor and in recent years outsourcing contracts have increasingly included the provision of capital assets. In the Irish context, these types of contract would be considered as a form of Public Private Partnership where they have a term of at least five years.

Design and Build contracts are contractual relationships between public sector bodies and private sector contractors for the design and construction of public facilities or infrastructure. The private sector contractor designs and builds the facility to meet the performance requirements specified by the public sector. The work is usually carried out for a fixed price so that the risk of construction cost overruns is transferred to the contractor. In return, the private sector contractor is able to utilise the construction techniques it wishes provided that it meets the specified performance standards. The public sector retains all of the risks associated with financing, operating and owning the facility.

Design, Build and Operate contracts are contractual relationships between public sector bodies and private sector contractors for the design, construction and operation of public facilities or infrastructure. The private sector contractor designs and builds the facility to meet public sector performance requirements (as in a Design and Build contract) and is also then responsible for operating and maintaining the facility for a predefined period, at the end of which it is transferred back to the public sector. The construction of the facility is financed by the public sector and it remains in public ownership throughout the term of the contract.

Design, Build, Operate and Finance contracts are contractual relationships between the public sector and private sector contractors for the design, construction, operation and financing of public facilities or infrastructure. The private sector contractor is responsible for designing, building, operating and financing the facility and recovers its costs solely out of payments from the public sector. At the end of the term of the contract, ownership of the facility commonly transfers to the public sector. This type of Public Private Partnership arrangement is well established in France, Italy, Spain, Portugal and the United Kingdom. **Concession** contracts are similar to Design, Build, Operate and Finance arrangements, except that the private sector contractor recovers its costs either through direct user charges or through a mixture of user charging and public subventions.

A number of other approaches to the allocation of risk between the public sector and the private sector have also emerged in recent years and these approaches have given rise to a wide range of other contractual forms within the Public Private Partnership spectrum. Some of the other contractual forms include:

Build, Operate and Transfer schemes - a private sector contractor builds a facility in accordance with a design prepared by the public sector. The private sector contractor finances the construction of the facility, but the facility is owned by the public sector. The private sector contractor operates the facility for a predetermined period and at the end of that period the facility is handed back to the public sector.

Build, Own, Operate and Transfer schemes - the private sector contractor builds a facility in accordance with a design prepared by the public sector. The private sector contractor finances the construction of the facility and legal ownership of the facility rests with the contractor until the end of the contract term. The private sector contractor is responsible for operating the facility for the contract term and at the end of that period the facility is handed back to the public sector.

Build, Own and Operate schemes - a private sector contractor builds a facility in accordance with a design prepared by the public sector. The private sector contractor finances the construction of the facility and is responsible for the operation of the facility in perpetuity. Ownership of the facility also rests with the private sector contractor in perpetuity.

Joint Ventures

Joint ventures are established where the public sector and private sector wish to share in the risks and rewards associated with a particular commercial enterprise, with each party undertaking the specific roles for which it has particular skill and expertise. The parties share in the risks and rewards of the enterprise either in accordance with their respective shareholdings or through other contractual arrangements.

Across the world, joint ventures between the public sector and the private sector are increasingly being used to help exploit the commercial potential of many public sector assets. Examples include activities such as patenting and the licensing of research and technology developed by public sector bodies.

Joint ventures are also becoming a popular way of advancing economic development and regeneration initiatives. They are increasingly used to help realise the potential in assets (particularly land) and are often related to particular economic or social policy objectives. Public and private sector partners contribute assets or finance and then share in the risks and rewards associated with the project. The public sector partner is likely to control project management and monitoring whilst private sector inputs will include technical and commercial skills and project financing.

Table 1 below sets out the main features, applications, strengths and weaknesses of the various possible PPP arrangements. It is followed by a flow chart depicting various procurement options. Both are sourced from the EU PPP Guidelines.

Table 1: Advantages and Disadvantages of PPP Relationships (source: Table 1: Guidelines for Successful Public – Private Partnerships (EU Guidelines pg 28))

PPP Type	Main Features	Application	Strengths	Weaknesses
Contracting	☐ Contract with Private party to design & build public facility ☐ Facility is financed & owned by public sector ☐ Key driver is the transfer of design and construction risk.	☐ Suited to capital projects with small operating requirement. ☐ Suited to capital projects where the public sector wishes to retain operating responsibility.	☐ Transfer of design and construction risk. ☐ Potential to accelerate construction programme.	☐ Possible conflict between planning and environmental considerations. ☐ May increase operational risk. ☐ Commissioning stage is critical. ☐ Limited incentive for whole life costing approach to design. ☐ Does not attract private finance
BOT	☐ Contract with a private sector contractor to design, build and operate a public facility for a defined period, after which the facility is handed back to the public sector. ☐ The facility is financed by the public sector and remains in public ownership throughout the contract. ☐ Key driver is the transfer of operating risk in addition to design and construction risk.	☐ Suited to projects that involve a significant operating content. ☐ Particularly suited to water and waste projects.	☐ Transfer of design, construction and operating risk ☐ Potential to accelerate construction ☐ Risk transfer provides incentive for adoption of whole life costing approach ☐ Promotes private sector innovation and improved value for money. ☐ Improved quality of operation and maintenance. ☐ Contracts can be holistic ☐ Government able to focus on core public sector responsibilities.	☐ Possible conflict between planning and environmental considerations. ☐ Contracts are more complex and tendering process can take longer ☐ Contract management and performance monitoring systems required. ☐ Cost of re-entering the business if operator proves unsatisfactory. ☐ Does not attract private finance and commits public sector to providing long term finance.
DBFO	☐ Contract with a private party to design, build, operate and finance a facility for defined period, after which the facility reverts to the public sector. ☐ The facility is owned by the private sector for the contract period and it recovers costs through public subvention. ☐ Key driver is the utilisation of private finance and transfer of design, construction & operating	☐ Suited to projects that involve a significant operating content. ☐ Particularly suited to roads, water and waste projects.	As for BOT plus: ☐ Attracts private sector finance; ☐ Attracts debt finance discipline; ☐ Delivers more predictable and consistent cost profile; ☐ Greater potential for accelerated construction programme; and ☐ Increased risk transfer provides greater incentive for	☐ Possible conflict between planning and environmental considerations. ☐ Contracts can be more complex and tendering process can take longer than for BOT. ☐ Contract management and performance monitoring systems required. ☐ Cost of re-entering the business if operator proves unsatisfactory. ☐ Funding guarantees may be

PPP Type	Main Features	Application	Strengths	Weaknesses
	risk. ☐ Variant forms involve different combinations of the principle responsibilities.		private sector contractor to adopt a whole life costing approach to design.	required. ☐ Change management system required.
Concession	☐ As for DBFO except private party recovers costs from user charges. ☐ Key driver is the <i>Polluter Pays Principle</i> and utilising private finance and transferring design, construction and operating risk.	☐ Suited to projects that provide an opportunity for the introduction of user charging. ☐ Particularly suited to roads, water (nondomestic) and waste projects.	As for DBFO plus: ☐ Facilitates implementation of the <i>Polluter Pays Principle</i> ; and ☐ Increases level of demand risk transfer and encourages generation of third party revenue.	As for DBFO plus: ☐ May not be politically acceptable ☐ Requires effective management of alternatives / substitutes, eg alternative transport routes; alternative waste disposal options)

Figure 1: Procurement Options (EU guidelines pg 18)

