Northern Victorian Irrigators (NVI)
NVI became an incorporated body in 2004 and by 2005 had 1200 members in the Murray and Goulburn Valley districts of Northern Victoria. Irrigators dependent on Murray, Campaspe and Broken rivers are also part of the body. At the time irrigators were facing two serious threats to their businesses; rapidly rising water prices and reduced availability of water. Together with these threats was an emerging public perception that irrigated agriculture was antagonistic to environmental well being.

Farm Management Decisions
Most NVI members have farms developed to maximise use of renewable resources within the constraints of what is economically feasible. Milk production primarily dependent on irrigated pasture had been encouraged in the region for decades. A period of significant farm development was made possible with the adoption of laser controlled land forming in the mid 1970's and improved on-farm structures for water control. This led to greater areas of irrigated pasture per labour unit. By the 1980's it seemed that the farms best adapted to facing the challenges of the cost-price squeeze were using water allocations of 180 to 200%. Such water use seemed to be good farm management and was encouraged by Department of Agriculture Agnotes and extension staff, Rural Water Corporation extension messages and the major extension program "Water-on Water-off" promoted by Target 10 in the early 1990's.

By the mid 1990's the water cap defined the limits to water for irrigation. But the level of irrigation development up to that point was able to continue until the drought of 2002/2003. In fact until this drought an irrigator could access a water allocation of greater than 180% in 21 of the previous 25 years.

In 2004 the possibility of an average allocation of 130% of water right was emerging in the Green Paper discussions. This was put aside in favour of the 80:20 deal whereby irrigators would give 20% of their sales water to the environment and a low security water share would be given for a portion of the sales pool.

NVI was concerned about the actual size of the future sales pool. Initially proponents of the 80:20 deal indicated the sales pool would be unchanged. Then it emerged that maximum water allocations would be 160% (with further deductions for the 20% to environment). By late 2005 DSE papers presented at Water Reform Consultative Committee meetings indicated 140% as the likely maximum water allocation. Quite separately Victoria had agreed to the Murray Darling Basin Business Plan released in April 2005 and this shows cap factors (allocations) of 118% and 130% in the future respectively for Murray and Goulburn Valley irrigators.

These developments verified the initial concerns of NVI members that pasture-based production systems which had evolved over the previous three decades would be seriously jeopardised by the emerging scenario for water availability.

The DPI project at Kyabram "Future Dairyfarming Systems in Irrigation Regions" has been able to quantify the impacts of water price and availability for some types of dairy farms. The greatest determinant of farm profitability appears to be the quantity of pasture harvested by cows. Farms with regional average performance (9.5 tonne DM/ha) for 'pasture eaten' will have real difficulty in being profitable as water price approaches $50/Ml and water allocations fall below 160%. The viability criteria for a successful farming operation as these challenges impact on irrigation farms requires urgent attention.

In this discussion the difficulty of using a physical water-use efficiency also emerges. A simplistic view could be that the first megalitre applied to a pasture produces a greater response than subsequent megalitres. However such a view would have little relationship with a profitable and sustainable farming system. Profitable systems need high yields of 'pasture eaten'. This demands very little moisture stress to pasture (therefore 10 Ml/ha/yr of irrigation water used) combined with the right species, drainage, fertiliser and skilled grazing management. Comparisons of water use per ha or per t of material grown are sensible only after adjustment for other determinants of plant growth and measurement of quality (metabolisable energy and protein).

Abundant data is available to describe perennial pasture, annual pasture and irrigated summer and winter crops performance under different water regimes in Department of Agriculture publications and from on-farm data.

One of the more extreme management strategies is to remove livestock from paddocks and feed them rations produced from crops grown and mechanically harvested as either green chop or for silage. Such a strategy is promoted by the advocates of water efficiency.

Table 1 describes this approach with double cropping under a pivot irrigator. This yields some 28t DM annually as forage using 9 Ml irrigation water as compared to a well managed perennial pasture providing 12 t DM eaten using 10 Ml of irrigation water.

An observer whose only concern was water efficiency would be quick to show that the forage cropping system produced more than twice as much per megalitre of water used. Even if the cropping system used flood irrigation it would still produce twice the forage grazed in the perennial pasture example.

The critical issue is cost. By the time the forage crops are fed out to animals the feed cost is twice that of grazed pasture.

Moreover the cropping/forage system requires exacting management, carries much greater risk and is dependent on much greater capital investment.

At current milk prices the cropping/forage system could only be considered on very large farms (say greater than 600 milkers) producing a significant part of the annual milk flow in late autumn and winter for a milk processor that paid a high premium for out-of-season milk. It is doubtful if 85% of farms could justify the capital cost of such a system.

The example in Table 1 also shows the high cost of using a sprinkler irrigator compared to flood irrigation. Expenditure of $450 p.a. in operating costs per hectare may give a saving of 10% on irrigation water used, and in so doing also incur an extra capital cost of $3750/ha.

Table 1 : Comparison of annual forage costs with conventional perennial pasture and double cropping maize then clover grass.

Perennial pasture	$/ha
Seed 20Kg @$&	140
Sow	60
Water 10Ml @$40	400
Fert: .5 t super	150
.2 t urea	120
	$ 870

Yield 12 t DM eaten/yr

Cost $72.50/t DM eaten

Double cropping	$/ha
Maize(Nov.-March)	
Seed	250
Fert: DAP	200
Urea	250
Sow	250
Spray	100
Water 7Ml@ $40	280
Irrigator fuel	350
Harvest @ $50/t DM	1000
	$2680

Yield: 20t DM/ha

Cost $134/t DM harvested

Clover/grass(April-October)	
Seed	60
Sow	60
Spray	50
Fert.: .2 super	100
Water 2Ml	80
Irrigator fuel	100
Harvest@ $50/t DM	400
	$ 850

Yield 8 t DM/ha

Cost $106/t DM harvested

Total both crops:

Variable input costs $3530

Yield 28 t DM/ha

Cost $126/t DM harvested

Notes on Table 1

(a) Capital costs, land $4000/ha, water $1000/Ml, sprinkler irrigator $3750/ha are not included above
(b) Labour costs omitted
(c) If pivot irrigator not used in double cropping program, there is annual saving of $450 in irrigator fuel and use of a further 2.5 Ml of irrigation water
(d) Double crop system would have the added cost of feeding fodder to stock of at least $25/t DM

The big savings in water use for profitable production systems were made over the past 25 years with adoption of farm plans, laster grading, good channels with effective water control, and structures plus drainage water reuse systems.

The foregoing material has been presented to show one example of how farm management decisions are related to water and most importantly to profitability.

Clearly if the pasture and cropping system comparison was applied to dairyfarming, water savings of about 50% could be achieved if cows were fed harvested forage from a double cropped system. But these water savings would be achieved only if year round farm milk prices were 30 to 50% greater (dependent on scale), if herds of less than about 500 cows were eliminated (capital costs too great), if a far greater dependence on fossil fuel was accepted and if the dairy industry was not dependent on having to be world competitive as it exports some 70% of production.

Cropping, meat production, and horticulture examples also could have been developed. The magnitude of water savings per hectare and per unit of production may have varied, but all would have been dependent on satisfactory returns to justify adoption of more sophisticated production systems.

The members of NVI primary concern is that their businesses remain profitable today and that methods are apparent for staying profitable in the future.

Uptake of Irrigation Technology
Rapid uptake of relevant new irrigation technologies is an obvious characteristic of irrigation farming and can be seen on almost all horticulture, dairying and irrigated cropping farms. Until the recent drought Murray and Goulburn Valley farmers had spent at least $10,000 per year over the preceding 15 years on typical 80 ha farms. But the proviso of relevance means economic decisions associated with labour saving and improved productivity must underpin these investments. Many techniques have not had widespread adoption because they are either unprofitable, require more development or do not fit into current systems. As usual early adopters will try these techniques. This trial and adaptation phase would benefit from encouragement and assistance in evaluation.

More recent accurate data describing investment in on-farm infrastructure does not appear to be available. But the trend is obvious with a slowing of investment in improving irrigation practices. The cause of this trend can be hypothesised only. The large amount of work done in recent decades may be part of the cause.

The more likely factors to reduce recent investment are associated with irrigation farms having had their confidence destroyed by the interaction of low commodity prices, the worst drought in 100 years, the average age of farmers moving well into their fifties, together with the usual rejection of the farm as an employment opportunity by younger family members. These factors, together with the media and government “spin” leaving no doubt in the community’s mind that irrigation has been the destroyer of our environment, are succeeding in reducing farmers’ faith in their future.

Clearly there must be a change in the perception of irrigated agriculture, especially by city based people. Not only must the place of irrigation farming in providing a major portion of the nation’s food chain be recognised, but also its role in generating renewable commodities and the basis of manufactured products for export. Within this picture the true situation of irrigation farmers being environmental managers deserves recognition. Society's attitude will need a profound change to recognise that food production at internationally competitive prices is a renewable industry that is dependent on water.

The environmental care associated with irrigated agriculture will need farmers with restored pride and community acknowledgement of their competent custodianship of resources. Without this care of the long term owner-operator there will be a trend to corporate holdings with their primary interest in profit and with their employees focused on what they produce rather than a concurrent interest about "their" farm.

Water Harvesting,Storage and Distribution Inpact on Farm Water Use Decisions
Initially the relationships between on-farm decisions and these off-farm water infrastructure issues may not seem apparent. But when considered into the future some major relationships with on-farm decisions emerge.

The fundamentals of water price and water availability are dependent on infrastructure performance.

The efficiency of water distribution is being influenced by major weed (particularly arrowhead) infestation in channels that were not apparent 20 years ago. Control methods remain largely ineffectual, expensive and constrained by increasing restrictions on herbicides and their methods of application. Meanwhile the channel system is facing serious reduction in delivery capability which in turn restricts both timely application of water at high flow rates associated with efficient water use. The poor performance of many of the channel systems now jeopardises the potential performance of on-farm irrigation developments. The continued spread of aquatic weed plus greater density of weed infestations also threaten channel integrity. A long term solution to this problem requires funding beyond what can be generated from irrigators. When an answer with a low recurrent cost is found it may be possible to implement techniques that actually create water savings.

Total Channel Control (TCC) is a technology that could influence distribution efficiency.

The NVI members who have had to work with the system have found serious weaknesses in the operation of TCC, and more importantly the operating cost of the system when costed against the water supplied will make farms in total channel control areas quite uncompetitive. Despite the expenditure of many millions of dollars on TCC in a small part of the channel system significant savings in water have not been demonstrated.

NVI members understand that Goulburn Murray Water is developing a pricing policy that will reflect the level of service for distribution of water to farms. Details are unavailable. But if a farm system such as sprinkler irrigation, which requires more frequent small applications of water, are penalised with a higher charge for their water potential on farm efficiencies may be discouraged.

The volume of water delivered by the distribution system will influence the unit costs. Two factors are reducing this volume; the markedly reduced availability of sales water, and in some areas the permanent sale of water entitlement out of the area. Eventually such changes could cause the cost of water to be too great for continued irrigation on remaining farms in a distribution system.

The efficiency of water storage, from an on-farm perspective, is also being threatened. The original purposes of storages as reserves of irrigation water and devices for flood mitigation now have other community demands and expectations. Recreational users and the true share of environmental water costs are increasingly being cross subsidised by irrigators.

Water Related Externalities

One of the major concerns of NVI has been the lack of socio-economic studies to predict the influence of water reforms, not only on irrigated agriculture, but also on districts and regions serviced by irrigation.

The transfer of 1 Gl of water to the environment or the transfer of this water out of the region usually equates to about one million dollars worth of on-farm income and perhaps three times this much within the region when farm produce is processed locally.

NVI fully understands the necessity of water trading but is adament that the playing field must be level. Current distortions, such as tax relief for purchase of water in some large developments, discriminates against existing irrigators with traditional enterprises.

Furthermore these trades, such as the muted 200 Gl extra flow for development below Swan Hill, do not appear to consider several issues. Among these are water transmission and evaporation losses, environmental impacts to new developments, environmental consequences of removing water from existing areas, security of supply to existing downstream users and the future viability of well established industries that have water sold out of their region. It is also more efficient to irrigate in say a 500 mm rainfall region than in a 250 mm region because overall much more is produced. Should another 150 Gl of water be sold out of the Goulburn Valley for use in new developments around Sunraysia we believe there will be serious consequences.

Recent environmental flows exceeding 520 Gl into the Barmah Millewa forest require more objective analysis. Flows into this forest have been happening for years and the general benefits are acknowledged. Our comment asks that our full community becomes knowingly involved in making value judgements. For instance, 500 Gl represents $500 million in on-farm income plus the flow on benefits for farm services and processing of farm output. These opportunities need to be balanced against alternate ways of using the water in the forest that quantify the benefits.

Until the benefits of environmental flows is known, together with the best way of managing environmental outcomes, suspicion and conjecture will exist, especially in irrigation regions.

Market Mechanisms

Water markets provide signals as to the value of water. In Northern Victoria water markets have provided an important mechanism for irrigators to assist farm management in normal times, and when drought would have otherwise had serious impacts on many enterprises. However NVI recognises that water markets do not indicate the true value of water to all irrigators.

The NVI disagrees with the view of the Goulburn Murray Water Chairman expressed in a paper at the 10th National Water Conference in 2005. He stated "..any discussion of water being unsustainable, by virtue of rising prices is tautologically impossible since the price only rises to the marginal use and so either it is bought because someone thinks it is possible to make a profit at that price or the price falls to where sustainable use kicks in".

We see the temporary trade water market as a place where for most of the irrigation season individual farmers can buy their deficiency in water. But there are many different types of irrigated enterprises both within and between commodities. A tomato grower could justify securing temporary water for 150 per Ml early in the season but this actual type of bid is out of the question for a dairyfarmer. With milk requiring approximately 1000 litre of irrigation water per litre of milk produced, water at $150/Ml represents a cost of 15 cents per litre of milk. When milk has an on-farm value of 25 to 30 cents/litre the majority of irrigators (dairyfarmers) could not operate at this price.

But there are occasions when dairyfarmers have paid $300 per Ml for temporary water. This represents a water cost greater than the value of milk produced from it. Such purchases were made in the drought, not for reasons of economic production on the day, but so milking herds could be retained for next season and so perennial pastures were not lost.

For much of the irrigation season the water market tends to be driven by the irrigators in need and prepared to pay more than they normally would for water. At the end of the season vendors are prepared to sell at values less than the water cost them simply to realise some money for an unused farm resource.

(Submission by Northern Victoria Irrigators Inc.
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Submission to Australian Government Productivity Commission regarding

Rural Water Use and the Environment : The Role of Market Mechanisms

By Northern Victorian Irrigators Inc.

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