

Rivers, rivers, everywhere.

The Ord River Irrigation Area and the economics of developing riparian water resources

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July 2013

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1. SUMMARY

The Wilderness Society has commissioned Economists at Large to conduct a literature review on the economics of developing northern Australia's riparian water resources.

In particular, this report will look at the Ord River Irrigation Area. Located predominantly in the East Kimberley region of Western Australia, although planned land releases will extend the area into the Northern Territory.

Despite the long history of calls to develop a northern 'food bowl' there has been little detailed economic analysis into the benefits and costs of doing so.

Developing northern Australia's riparian water resources has historically required significant amounts of public investment. Future expansion is likely to be no different. Were this not the case, it is likely that the private sector would have already invested.

There is a serious need for extensive economic analysis into the viability of irrigation projects prior to project construction, as well as economic evaluations post completion. This is something that has been noticeably lacking in available literature, although it is by no means a recent phenomenon. The economist Bruce Robinson Davidson wrote extensively on the economics of the Ord River Irrigation Area and found that in most cases, politics trumped economics. Many of the motives discussed by Davidson and his rebuttals to these motives are as relevant today as they were when he wrote them over 40 years ago.

At a state level, Western Australia has a suite of policies, the Strategic Asset Management Framework (SAMF), designed to assist with decisions regarding major infrastructure investment. An inquiry into the Ord-East Kimberley Expansion project found that the SAMF had not been used to assess the project.

The experience of the Ord River Irrigation Area suggests that rather than following an established process for analysis, things are often muddled. Beginning first with a plan for infrastructure based on broad economic assumptions about the region and often failing to adequately assess the economic potential of various crops.

The most recent comprehensive benefit-cost analysis of the Ord River Irrigation Area was released in 1993. This analysis, by consultants Hassall & Associates showed that between 1958 and 1991 the government had invested \$613 million into the scheme to extract benefits of just \$102 million. In other words, for every \$1 invested in the ORIA, the public has received back just 17 cents.

To put this into perspective, had the government invested the amount it spent up until 1972 on public works in an interest-bearing asset earning just 2.5% annually, it would have had over \$600 million in the bank by 1992¹, rather than a \$511 million loss.

¹ Calculated based on \$376.8 million in public capital costs up until 1971/72, compounding at 2.5% annually over 20 years.

Hassall & Associates also forecasted future benefits and costs for the Ord River Irrigation Area out to 2021.

In recent years, an additional \$379.50 million of capital expenditure has been committed to the Ord River Irrigation Area as part of the Ord Final Agreement in 2005 and the Ord Irrigation Expansion Plan in 2009.

An update of the Hassall & Associates analysis could have been undertaken at relatively low-cost to gain a truer picture of the ORIA in 2009 based on empirical data about actual production levels and government expenditure.

Adjusting known costs to 2012 dollars, we can conservatively estimate that around \$1.45 billion has been spent on the Ord River Irrigation Project to date. This does not include any farming related infrastructure investment as part of the Federally funded Ord East Kimberley Development Package. Against these costs, we have known benefits of \$14 million in 1991, adjusted to \$24 million in 2012 dollars. This ignores any profits made between 1991 and 2012 and these would need to be considered to estimate the net costs of the ORIA. Similarly, the current round of investment is presupposed upon future profits being earned by whoever develops the new areas of land available.

More detailed analysis of costs and benefits would have been invaluable to the public debate about the benefits of further investment in the ORIA. The work of Hassall and Associates provides a template against which empirical data could have been entered and it is disappointing that the ex-ante analysis wasn't updated prior to new investment in the Ord.

Over 40 years ago, the economist Bruce Davidson discussed the importance of asking some basic questions about developing northern Australia. These questions remain as valid as ever, especially in light of our analysis of the Ord River Irrigation Area.

Recent years have shown that small volume, high margin fruit, vegetables and niche products may be viable within the ORIA, though the region remains broadly reliant on tacit government support, as shown by recent government investment in the Ord Irrigation Expansion Project.

There is little doubt that the Ord River Irrigation Area has benefited people in the immediate region. Though this simply reflects a shifting of resources and not necessarily an increase in the size of the pie. Analysis of farm returns rather than gross value of production is essential if we are to understand the true viability of agricultural industries.

With renewed calls to develop northern Australia and the release of the socio-economic component of the Flinders and Gilbert Agricultural Resource Assessment due late 2013, we believe these issues are as important to understand as ever.

2. INTRODUCTION

2.1. BACKGROUND

The Wilderness Society has commissioned Economists at Large to conduct a literature review looking into the economics of developing northern Australia's riparian water resources.

In particular, this report will look at the Ord River Irrigation Area. Located predominantly in the East Kimberley region of Western Australia, although planned land releases will extend the area into the Northern Territory.

2.2. RESEARCH QUESTIONS

This literature review will attempt to provide some insight into the following questions:

How much public investment has been made to date to develop riparian water resources in northern Australia? With a focus on the Ord River.

Have the benefits of development exceeded the costs?

What level of future investment is being discussed and have adequate benefit-cost analyses been undertaken?

2.3. SCOPE AND REGION

For the purpose of this report, northern Australia refers to the areas defined by the Tanami-Timor Sea Coast and the Carpentaria Coast drainage divisions. The current population for these drainage divisions is estimated at 267,000. Major population centres are Broome, Darwin and Mount Isa. Another common definition of northern Australia is those parts north of the Tropic of Capricorn.

In particular, this report will look at the Ord River Irrigation Area. Located predominantly in the East Kimberley region of Western Australia, although planned land releases will extend the area into the Northern Territory.

2.4. RESEARCH METHOD

The analysis in this report is based on a desktop literature review undertaken between January and June 2013. The best sources identified in the course of this research are identified below. Not all of these were readily available. In one case the document is not available publically, in other cases, documents were not readily available online or through inter-library transfers.

Year	Source	Reviewed for this research
2011	Public Accounts Committee. 2011. Review of Selected Infrastructure Projects, report no. 14 in the 38 th Parliament.	Yes
2009	Regional Development and Lands. 2009. Ord East Kimberley Development Plan. Government of Western Australia, WA.	Yes
2009	Webster et al. 2009. Chapter 10: Irrigated agriculture: development opportunities and implications for northern Australia.	Yes
2008	Ayre, M. 2008. Collaborative Water Planning: Retrospective case studies. Volume 4.2, Water Planning in the Ord River of Western Australia, TRaCK, Tropical Rivers and Coastal Knowledge.	Yes
2007	WA Department of Treasury and Finance (2007) Economic Evaluation of the Ord Stage 2 Development Proposal, Internal Research Report 2007, Department of Treasury and Finance, Western Australia.	Not available
2004	Marsden Jacob Associates (2004) Ord Expansion Project — Business Case Evaluation, prepared for the Department of Industry Resources. Note: this report was then updated in 2008 and submitted to the Public Accounts Committee (2001).	No
2002	Greiner, G. 2002. Further lessons from the Ord. CSIRO Sustainable Ecosystems. Paper presented at the 46 th Annual Conference of the Australian Agricultural and Resource Economics Society, Canberra.	Yes
1999	Head, L. 1999. The Northern Myth Revisited? Aborigines, environment and agriculture in the Ord River Irrigation Scheme, Stages One and Two, Australian Geographer, 30:2, 141-158	Yes
1997	Sinclair Knight Mertz (1997) Ord River Irrigation Area Stage 2 Expansion, September 1997, prepared for the Western Australian and Northern Territory Governments.	No
1994	Western Australia Department of Resources Development. 1994. Ord River Irrigation Project : a review of its expansion potential.	Yes
1993	Hassall and Associates. 1993. The Ord River Irrigation Project, Past, Present and Future: an Economic Evaluation. Stage 1 & 2. Report to the Kimberley Water Resources Development Office. s.l. : Hassall and Associates, Pty Ltd, Perth.	Yes
1982	Davidson, B.R. 1982. Economic Aspects of the Ord River Project. The Centre for Independent Studies, Policy Monographs 2. In references under Centre for Independent Studies.	Yes
1982	Graham-Taylor, S. 1982. A critical history of the Ord River Project, The Centre for Independent Studies, Policy Monographs 2. In references under Centre for Independent Studies.	Yes
1982-2012	Western Australia. Dept. of Agriculture. Kununurra Regional Office. Kununurra Agricultural Memos.	Yes
1979	Young, N.S. 1979. Ord River Irrigation Area review, 1978 : a joint Commonwealth and Western Australian review	No
1972	Davidson, B.R. 1972. The Northern Myth: Limits to agricultural and pastoral development in Tropical Australia. Melbourne University Press 3 rd ed.	Yes
1964	Bureau of Agricultural Economics. 1964. The Ord River Irrigation Project. Benefit-Cost Analysis. Canberra, Australia.	Yes

3. THE HISTORY OF CALLS TO DEVELOP NORTHERN AUSTRALIA

Despite the long history of calls to develop a northern 'food bowl' there has been little detailed economic analysis into the benefits and costs of doing so. This section provides a brief history of calls to develop northern Australia.

Peanuts, tobacco, cotton and rice were grown in northern Australia as far back as 1880 (Webster et al., 2009). Following World War II there was a strong political push to 'develop the north' and following a review, several causes of previous crop failures were identified:

- Environmental: a formidable climate, unsatisfactory soils, floods and droughts, widely varying topography.
- Economic: isolation from markets, transport costs, the lack of marketing.
- Social: unattractive social and living conditions.

Cook (2009) looked at how land use policy regarding the development of northern Australia has changed over time, from the need to develop the north for defence purposes, to the period between 1940 and 1966 – defined as the 'Golden Age' – when significant R&D investments were made by government to promote northern development. This period includes the development of the initial diversion dam and land release at Kununurra on the Ord River. The author makes a significant conclusion in the paper - that while R&D has improved knowledge of farming practices, more work needs to be done to consider the broader picture of agronomic, economic and environmental challenges being faced in northern Australia.

Between 2007 and 2009, the Northern Australia Land and Water Taskforce (the Taskforce) undertook the most comprehensive analysis of the potential for development in northern Australia to date as part of the National Water Initiative. Many of the motives identified by Davidson (1972) can be applied equally to the justification for commissioning the Taskforce. However climate change and shifting patterns of agriculture is a new motive and has been at least partly responsible for increased interest in northern Australia in recent years. The role of the Taskforce was to consider sustainable development opportunities for northern Australia based on resource availability (NALWT, 2009). The Taskforce used information on quantity, timing, location and availability of water from an earlier report to assess options for land and water use.

A 2009 journal by the Australian Farm Institute also considers opportunities for northern Australia from an agricultural perspective (Australian Farm Institute, 2009). The journal suggests that the resurgence of interest in developing northern Australia is partly due to a prolonged drought in southern Australia and concerns about climate change.

In the lead up to the federal election in 2013, a discussion paper outlining the Federal Coalition's 2030 vision for northern Australia was leaked. The paper discussed the potential of growing markets in Southeast Asia and called for greater investment and development of northern Australia by 2030, (Liberal Party of Australia, 2012). The initial draft of this discussion paper flagged the allocation of \$800 million into tropical health provisions and research, but otherwise provided no details on the

actual costs involved in developing northern Australia. However, there were specific growth targets the Coalition hoped to achieve by 2030. These included the creation of a 'food bowl' to double Australia's agricultural production as well as significant growth in tourism, energy, resources and defence industries.

This call has been reiterated in a more recently released paper available on the Liberal Party of Australia Website titled 'The Coalition's 2030 Vision for Developing Northern Australia', (Liberal Party of Australia, 2013).

4. QUESTIONING CALLS TO DEVELOP NORTHERN AUSTRALIA

In his seminal work on the topic, the economist Bruce Davidson (1972) raised issues regarding developing northern Australia that are as relevant today as they were 40 years ago.

[Many] people assume that no attempts have ever been made to develop Australia north of the Tropic of Capricorn and that it is a fertile land which, with a little research, would quickly support a large agricultural population...Yet few Australians have ever asked themselves the following questions:

- 1. Why should we develop northern Australia?*
 - 2. Why hasn't it developed at the same rate as the southern half of the continent?*
 - 3. Why is agricultural settlement considered the right sort of development?*
 - 4. If agricultural development is desirable, has our approach to the problem been a sensible one?*
- (p. 1)*

Davidson identified several common motives behind developing northern Australia. The first was due to the perception that if we don't occupy the area, populations in Asia might look to do so. Related to this idea, Davidson suggested that another motive was based on the need for a large population in the north to 'defend the area'. Third, the perception that valuable resources close to big markets are going to waste. Fourth and closely related to the previous point, that agricultural development of the north has the potential to 'supply the undernourished regions of the world, particularly Asia, with food'. Fifth, Davidson identified an import substitution motive based on the idea that domestic production of tropical crops would displace existing imports and improve the balance of payments. The sixth and final motive identified by Davidson relates to the need to develop the north to raise the standard of living for indigenous Australians living in the region.

Davidson examines each of these motives and provides a compelling arguments to suggest that they are misguided.

Davidson suggests the occupation argument is the oldest of the motives for increased settlement of northern Australia and claims the days of development through settlement are behind us, writing:

The struggle between nations for raw materials and markets continues but by other means.
(p.2)

Further, he reminds readers that Asian nations have known about northern Australia for hundreds of years, without ever attempting to occupy it.

Regarding the defence argument, Davidson suggests that development potentially makes a region a more attractive 'prize', he writes:

This obvious point is somehow forgotten; any conqueror would like a developed rather than an undeveloped land; southern Australia would be a far more attractive prize than the north (p.4)

Davidson also suggests that if resettlement were an agenda, there are large areas within China and South-East Asia that would be more attractive.

Discussing the idea that valuable resources close to big markets are going to waste, Davidson wrote "Cotton, peanuts, sugar, sorghum, rubber, linseed, safflower, tobacco and rice, the crops which might be grown in tropical Australia, are all produced or could be produced our our Asian neighbours" (p.13). Davidson believed that the region could not compete with these crops if they were grown in Asia where costs would be lower both for production and transportation.

Discussing the potential to feed undernourished regions of the world and in particular, Asia, Davidson argued "the shortage of food in Asia is far more a question of lack of capital, education and technology than one of land shortage." (p.5). Davidson also suggested that there is plenty of undeveloped land in 'southern' Australia that could be used for agriculture if required.

Import substitution is the idea that countries will be better off if they replace imports with domestic production. Davidson discussed this idea but suggested that it only makes sense if the region could be a least-cost, or at least low-cost, producer of any crops growth. His analysis at the time indicated that the ORIA was in-fact a high-cost location.

Finally, Davidson discussed the indigenous disadvantage motive. This is the idea that greater development will improve the welfare of indigenous populations across northern Australia. At the time, Davidson said that this 'is the least-discussed reason for development' (p.7). Davidson claimed opportunities for employment to raise living standards were slim when considering the type of employment potentially available. He reported that indigenous people had not benefited from employment in the construction of a meatworks or the Ord River Dam. He suggested that if the aim is to improve indigenous disadvantage, then the role indigenous people will play in greater development of northern Australia should be more clearly specified.

5. IS PUBLIC INVESTMENT JUSTIFIED?

Developing northern Australia's riparian water resources has historically required significant amounts of public investment. Future expansion is likely to be no different. Were this not the case, it is likely that the private sector would have already invested.

In order to justify public investment, an economic case would require that taxpayer's money is able to generate a return on investment. There may be other social or political reasons for wanting to develop northern Australia but we will not investigate those in detail.

There is a serious need for extensive economic analysis into the viability of irrigation projects prior to project construction, as well as economic evaluations post completion. This is something that has been noticeably lacking in available literature, although it is by no means a recent phenomenon. The economist Bruce Robinson Davidson, claimed in 1982 that there had been inadequate economic assessment dating back to the original investment in the Ord River Irrigation Area and even earlier to nearly all irrigation schemes in the southern states, (Centre for Independent Studies, 1982). Davidson had been writing about the economics of the ORIA as far back as 1965. In an attempt to explain apparent economic irrationality, Davidson suggests that politics tended to trump economics.

...the political advantage to be gained from proceeding with the project outweighed the economic advantages of not proceeding with it. (Centre for Independent Studies, 1982) (p.20)

Recent observations with the Ord East Kimberley Expansion Plan suggest that this has not changed.

At a federal and state level, regulatory impact statements and cost-benefit analysis is often required to answer such questions. Infrastructure Australia, a statutory advisory council set up to advise the Federal Government on infrastructure investment, provides a good methodology for assessing the worth of infrastructure investments. The aim of the methodology is to be:

1. Logical and well-defined;
2. Clear and transparent;
3. Evidence driven;
4. Robust.

Source: Infrastructure Australia (2008)

At a state level, Western Australia has a suite of policies, the Strategic Asset Management Framework (SAMF), designed to assist with decisions regarding major infrastructure investment. An inquiry into the Ord-East Kimberley Expansion project found that the SAMF had not been used to assess the project, (Public Accounts Committee, 2012).

6. IRRIGATION SCHEMES IN NORTHERN AUSTRALIA

The three biggest irrigation areas in northern Australia are currently the Lower Burdekin Irrigation Area (LBIA), the Ord River Irrigation Area (ORIA), and the Katherine-Douglas-Daly-Area (KDDA). Petheram et al. (2008) provides a good overview of each area for comparison.

Other areas have also been developed or assessed but subsequently abandoned, such as the Camballin Irrigation Area or the West Kimberley Irrigation Area, see (Yuhun, 2001) and (Gassemi & White, 2007a).

This report will focus on the Ord River Irrigation Area because it has been widely studied over the years and because it has received commitments for further government investment of over \$500 million as part of the Ord East Kimberley Development Plan.

Economic analysis of agriculture in a particular region can be undertaken in various ways.

First, the economics of the region need to be understood. This includes analysis of infrastructure, access to markets and the availability of inputs such as labour and machinery.

Second, and most importantly, the economics of the farming enterprise needs to be understood. In particular, the economics of a particular crop are important and these can change over time due to advances in agronomy, changes in consumer tastes and changes in domestic and global supply and demand. Due to the vagaries of weather, the economics of a particular crop can also be determined over the course of a single growing season. Historically, analysis of crops has focused on technical feasibility of growing the crop, rather than economic viability.

Finally, there needs to be a clear plan against which to assess costs and benefits of a particular set of development options.

The experience of the Ord River Irrigation Area suggests that analysis is often muddled. Beginning first with a plan for infrastructure based on broad economic assumptions about the region and often failing to adequately assess the economic potential of various crops. The following section will discuss the Ord River Irrigation Area in detail.

7. THE ORD RIVER IRRIGATION AREA

The Ord River Irrigation Area (ORIA) is the second largest area of intensive irrigated agriculture in northern Australia after Lower Burdekin Irrigation Area. It is located on the floodplains of the lower Ord River in the east Kimberley region of northern Western Australia with a catchment that extends into the Northern Territory and is the largest irrigation area within the Tanami-Timor Sea Coast and the Carpentaria Coast drainage divisions.

7.1. A HISTORY OF THE ORD RIVER IRRIGATION AREA

It is common to refer to ‘stages’ when discussing various periods of development of the ORIA. Stage 1 generally refers to the construction of the initial diversion dam, now Lake Kununurra and development of land within the Ivanhoe Plains and Packsaddle Irrigation Districts. Stage 2 is anything following this up until the Ord East Kimberley Development Plan, which is sometimes referred to as Stage 3. Recent documents even refer to the potential for a ‘Stage 4’ (George, 2010).

In reality, the idea of stages implies a level of certainty and planning that has never really existed. Therefore, in discussing the history of the ORIA below, we opt for the relatively simpler division by key periods as observed in the literature. The bulk of our historical analysis of the Ord River Irrigation Area comes from two essays contained within a report entitled “Lessons from the Ord”, (Centre for Independent Studies, 1982). Due to our reliance on these two essays, we will provide citations below where a statement is not derived from this source. Readers seeking a more detailed history of the project are directed to these essays.

LATE 1930S TO 1966

The ORIA had its beginnings around 1939 when a Royal Commission investigated the possibility of irrigation on the Ord River. Following agronomic trials conducted at an early experimental farm and by the Kimberley Research Station, by 1958 the State Government considered that the viability of an irrigation scheme had been demonstrated and the first stage of development commenced with the construction of a diversion dam that created Lake Kununurra. Although originally conceived as a scheme to support the existing northern pastoral industry, poor yields led to exploration of other crops such as rice, cotton, sugar, linseed and safflower.

Initial development was completed in 1963 and by 1966 31 irrigated farms had been allocated irrigation water.

1967 TO 1980

Despite no profitable system of farming having been developed during stage 1 of the ORIA, in 1967, the Commonwealth Government provided funding for construction of the main dam on the Ord River upstream of the existing diversion dam.

The construction of the main dam was completed in 1972 and resulted in Australia’s largest inland reservoir, Lake Argyle.

By 1973, 12,000ha of cotton had been established. However, increasing production costs, largely due to pests, put farmers into serious financial difficulty and cotton production stopped in 1974.

1974/75 saw a combined area of just 1331ha utilised for sorghum, safflower and hay. The lowest levels of cropping since the scheme started, (Hassell & Associates Pty Ltd, 1993).

In 1978, a Joint Commonwealth and Western Australian Government Committee undertook a review of the ORIA. The committee reported in 1979 concluding that further expansion of the scheme was at the time unwarranted but that crops showing some commercial potential should be supported with guaranteed farm-gate prices for the following five years.

1981 TO 1990

In the 1980s crops expanded to include horticultural crops and farms began to focus on high value crops and crops that could be produced out of season for both domestic and international markets.

1991 TO 1999

In the early 1990s, the Western Australian Government formed the Kimberley Water Resources Development Advisory Board to investigate "actions to maximise the value to the community from the development of the Kimberley water resource" (Hassall & Associates Pty Ltd, 1993a). The Board appointed Hassel & Associates to investigate the economics of the ORIA to date, and the economics of a potential expansion.

On the basis of the analysis by Hassall & Associates, the WA Government decided that expansion was viable and released the report titled *Ord River Irrigation Project : a review of its expansion potential* in 1994, (Government of Western Australia and Government of Northern Territory, 1994).

In the mid 1990s, Pacific Hydro constructed a 30MW hydro-electric power station at the Ord River Dam and a sugar mill was constructed as a joint venture between CSR Limited and the Ord River District Cooperative (Gassemi & White, 2007b).

In 1997, another report was released by Sinclair Knight Mertz, on behalf of Western Australian and Northern Territory Governments and looked in more detail at the "Stage 2 expansion" consisting of the development of new land and a new irrigation supply channel, the M2 channel. These were the same areas first identified in the 1994 report and included:

the Upper Weaber Plain of WA (18 780 ha), Lower Weaber Plain of NT (4507 ha), Knox Creek Plain (WA & NT) and Lower Keep River Plain of NT (17 443 ha), and the Knox Creek Plain of WA and NT (9483 ha) Riverside Developments in the Ivanhoe Plain and west of the Ord (1646 ha), Carlton Plain (9167 ha), and Mantinea Flats (3250 ha).

(Gassemi & White, 2007b) (p.388-389)

Expressions of interest were sought from the private sector to finance the expansion to the M2 area. In 1998, three organisations comprising a consortium were identified as preferred developers of the Ord Stage 2, Wesfarmers Pty Ltd, Marubeni Corporation and WA Water Corporation.

2000 ONWARDS

A 2001 feasibility study for the Wesfarmers consortium found that the estimated financial returns from the project were likely to be inadequate due to the volatility of world sugar prices, uncertainty about the amount of irrigation water, unresolved land access issues and environmental issues, (Gassemi & White, 2007b).

In 2003, the Western Australian and Northern Territory Governments advertised for a consultant to prepare a 'business case' for expansion of the ORIA to the M2 area. In 2004, Marsden Jacob & Associates released their report *Ord Expansion Project — Business Case Evaluation*.

In 2005, the Western Australian Government negotiated a settlement with respect to Native Title over areas of ORIA, including areas within the M2 area and the Ord Final Agreement (OFA) was finalised. Under the terms of the agreement, the Miriuwung and Gajerrong people would receive a \$57 million compensation package for the extinguishment of native title over 65,000ha of East Kimberley Land and for the social and environmental impact of the Ord Stage 1 project, (Department of Regional Development and Lands, 2009).

In September 2006, the Western Australian Government again called for an expression of interest from the private sector into the development of the M2 supply area. However, in 2007 the Western Australian Government identified impediments to progress, including the cross-jurisdictional nature of the proposal and high infrastructure costs, (Ayre, 2008). Ayre reported that the number of the farmers in the ORIA had decreased from 200 to 12 and that many were leaving farming to work in mining.

In 2008, the sugar mill constructed in the mid 1990s was dismantled (Public Accounts Committee, 2011a). By this time, tropical forestry occupied the largest area of land in the ORIA at 5149ha in 2009, or 37% of the total area cropped, (Ord Irrigation Cooperative Ltd, 2009). Other niche crops such as chia seeds were also showing promise but a trial of rice suffered from pest damage, (Brann, 2012).

Money to begin developing the M2 supply area eventually came not from the private sector but from the state government, with assistance from the federal government as part of what is known as the Ord-East Kimberley Development Plan.

Under the terms of the agreement the federal government would invest \$195 million in infrastructure as part of what was called the East Kimberley Development Package. This funding was part of a \$4.7 billion Nation Building plan and was contingent on the state government investing a similar amount in developing the Ord Irrigation Expansion Project, (Department of Regional Development and Lands, 2009), (Australian Government, 2009).

Originally, the state contribution was estimated at \$195 million before being formally announced at \$220 million by then Minister for State Development, Colin Barnett and the Parliamentary Secretary for Western Australia, Gary Gray (Department of Regional Development and Lands, 2009). The cost to the state is now reported at \$322.5 million with \$311 million coming from the Royalties for Regions initiative and \$11.5 million coming from the Department of State Development, (Landcorp,

2012). The Wesfarmers consortium had originally estimated that \$500 million would be required to develop the M2 area (Gassemi & White, 2007b).

In 2011 and 2012 the Public Accounts Committee released reports examining the planning and delivery of infrastructure projects in Western Australia (Public Accounts Committee, 2011a, 2012). One project the committee examined was the Ord-East Kimberley Expansion Project. In their 2012 report, the committee concluded:

The Expansion Project budget has now increased to \$321 million, and although it might now be better placed to deliver on its aims, we must conclude on a similar question to that which we ended last year's review with – would a greater number of sustainable Indigenous jobs have been created by investing the money in alternative projects? (p.16)

In November 2011, the Government sought expressions of interest for 17 farm blocks in the Goomig Farm Area (7,400ha) within the Weaber Plains and two parcels of undeveloped land on the Knox Plains (6,000ha) and the Ord West Bank (1,700ha) (Landcorp, 2011). Brann (2012) reported that the land would not be suitable to tropical forestry and so TFS, the company managing the Indian Sandalwood plantations in ORIA, would not be bidding for any of the new areas. TFS would instead be looking at land in the Burdekin in Queensland and the Douglas-Daly and Katherine regions of the Northern Territory.

In late 2012, the Western Australian Government announced that a Chinese company, Shanghai Zhongfu (trading as Kimberley Agricultural Investment) would be the preferred developer of the Goomig Farm and Knox Plain areas. According to Landcorp (2012), approvals for the Knox Plain area are yet to be finalised:

The preferred proponent(s) for the Ord West Bank and Knox Plain will be required to progress the necessary statutory planning and, where applicable, environmental approvals and fulfil obligations under the Ord Final Agreement. These obligations have been met by the State Government for the Goomig Farm Area.
(p.7)

Shanghai Zhongfu (Group) Co Limited is a subsidiary of a Chinese construction company, Shanghai Zhongfu Real Estate Co Limited, (Landcorp, 2012). The company reportedly has assets of \$2.3 billion and the Chairman, Wu Pungai, has permanent residency in Australia and is also planning to invest \$700 million in the Perth real estate market, (AFR, 2013).

Very little detailed information is yet available about the Kimberley Agricultural Investment (KAI) proposal. Landcorp (2012) discuss a \$700 million proposal based around long-term lease and contract farming arrangements, combined with the construction of a \$425 million sugar mill. However, within a month of the announcement about KAI, the company was already stating that scale and government support to streamline approvals would be essential to the project going ahead, (Weekly Times, 2012).

The mill would reportedly be able to process up to four million tonnes of sugar cane per annum, producing up to 500,000 tonnes of sugar crystal (Landcorp, 2012). The potential for the mill to turn the sugar into ethanol or to generate power has also been discussed. KAI has stated that at least 2 million tonnes of sugar cane would be required before it made sense to build the mill, (Weekly Times, 2012).

Based on reported yields in 2005/06 and 2006/07 of 116 and 119 tonnes of sugar cane per hectare, this would require an area of between 17,000ha and 35,000ha. The entire area of the Goomig Farm and Knox Plain areas amounts to 13,400 ha, (Landcorp, 2011). As a result, KAI will need to secure a minimal additional area of 3,600 ha assuming it can obtain favourable yields. This could be acquired by convincing existing landholders on the Ivanhoe Plains and Packsaddle districts to grow sugar, or through expansion into new areas in Western Australia and the Northern Territory. To reach full capacity of 4 million tonnes, development of new areas will be required. Landcorp (2012) identifies potential areas where expansion could take place.

In late May 2013, media releases by the Western Australian Premier, Colin Barnett and the Minister for Regional Development and Lands, Brendon Grylls, confirmed that KAI would be the preferred proponent for development of Goomig Farm and Knox Plains areas. They announced an investment of \$450 million for a sugar mill, \$200 million for development of land and \$50 million for improvements to Wyndham Port, (Government of Western Australia, 2013). Based on reported costs for land development, this works out at around \$15,000 in development costs per hectare, assuming this is referring to the entire 13,400 ha area. In the media release, the KAI proposal is reported to include:

- Contract grower opportunities for existing landholders in sugar and rotational cropping
- Multiplier effects on local businesses
- Potential construction of sugar mill
- Future development of co-generation power
- Strategy to underpin local indigenous civil contractors
- About 350 local jobs
- Potential ethanol plant
- Potential for medium density fibre board plant annually producing up to 300,000 tonnes
- Possible establishment of industrial park at Kununurra
- Improvements to Wyndham Port facilities.

On the same day as the government media release, The West Australian reported that KAI would grow sorghum “while weighing up the merits of a Kimberley sugar industry”, (Thompson, 2013). According to the article, KAI must meet a series of milestones in order to retain first rights to areas of land. One reported milestone involves the clearing of 1000ha of land by October 2013.

In May 2013, the Northern Territory government confirmed its support for ‘Ord Stage 3’, the expansion into the Northern Territory, (Van Holthe, 2013). In a media release, the Minister for Primary Industry and Fisheries, Willem Westra Van Holthe, confirmed \$400,000 in funding for the

Ord Development Unit, to help progress the project, which was also granted Major Project Status. In the media release, the Minister suggested that it was a desire to become a 'food bowl' for Asia that led to support for the project:

In this, the 'Asian Century' we must develop a food bowl for which we can sell to the growing middle class in developing Asian nations. The Northern Territory must capitalise on our geographical position and fertile soils.

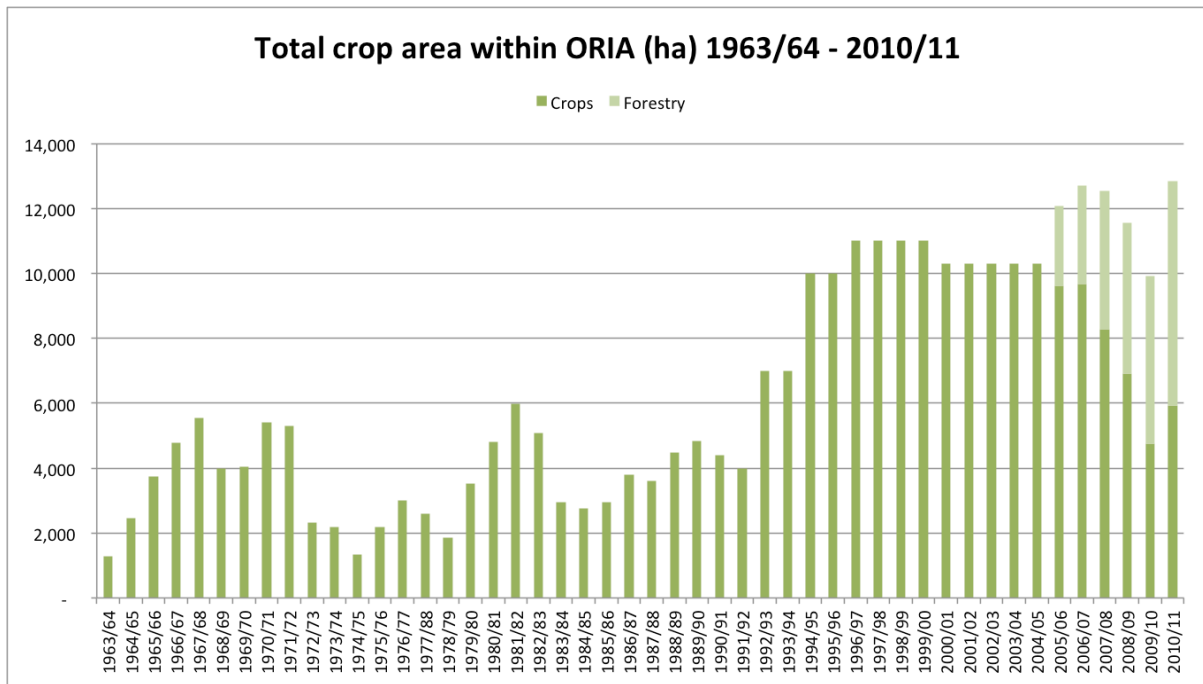
7.2. HISTORICAL CROP PRODUCTION FROM THE ORIA

When farmers first planted commercial crops within the Ord River Irrigation Area in 1963, they grew cotton, safflower and rice. By 2011, the mix has changed somewhat. A very small amount of cover crops such as hay are typically grown in the wet season, but the vast majority of cropping takes place during the dry season roughly between May and November.

TOTAL CROP AREA

The chart below shows the historical crop area within the ORIA. In recent years, tropical forestry and Indian Sandalwood in particular has become a significant ‘crop’, accounting for over 50% of land area in recent years and over 50% of irrigated water, (Ord Irrigation Cooperative Ltd, 2009).

Chart 1: Total crop area within ORIA (ha) 1963/64 - 2010/11



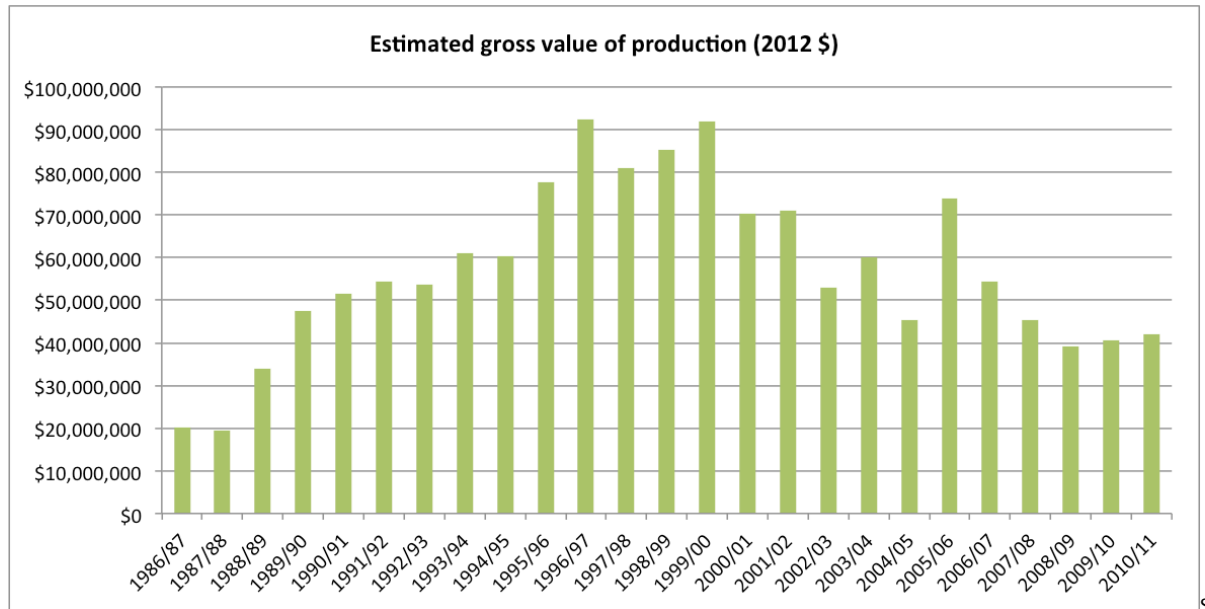
Source: Ecolarge analysis based on various sources. Data available on request.

VALUE OF PRODUCTION & ESTIMATED VALUE ADDED

Estimates for the gross value of production in 2012 dollars is provided in the chart below. Over this time frame, the aggregate gross value of production is estimated at \$1.45 billion in 2012 dollars.

Based on returns between 1958 and 1990/91 reported by Hassall & Associates of 5%, we can assume a value added for the period of 1991/92 to 2010/11 of \$62.6 million.

Chart 2: Estimated gross value of production (2012 \$)



Source: Ecolarge analysis based on various sources. Data available on request.

Figures above do not include annuity values for Indian Sandalwood used in recent crop reports. That is because annuity values do not represent actual market value in any given year. Mr. Francis Bright, the Regional Economist with the Department of Agriculture and Food WA based in Kununurra explained how annuities for sandalwood are estimated in a recent inquiry into major projects in Western Australia.

The way an annuity is calculated is that forestry is a terminal harvesting operation. We believe that the rotation length is 15 to 16 years. What an annuity does is looks at that terminal value and spreads it over the 15 years, and what it assumes is that trees grow at a constant rate.

Source: (Public Accounts Committee, 2011b) (pp.2-3)

The use of an annuity value is potentially misleading and amounts to a form of counting chickens before the eggs have hatched. In addition, using an apparently nominal annuity value would significantly overstate the true value of the asset. This is demonstrated by the valuation used by the owner of the sandalwood plantations, TFS Corporation.

TFS Corporation's own annual report for 2012 lists a 'total carrying value' for plantations of \$85.7 million, (TFS Corporation Ltd, 2012). This is a more realistic figure to use and is based in part on the following assumptions:

- (i) 100% of the trees will be harvested and sold within 13 to 15 years of being planted.
- (ii) (The price of sandalwood is constant and determined by market prices, being \$2,500 USD/kg (2011: \$2,500 USD)
- (iii) Forecast heartwood production at 25kg to 30kg per sandalwood tree at 40% to 50% moisture content.
- (iv) Projected oil content of 3.15% (2011: 3.15%) from forecast heartwood.
- (v) The costs expected to arise on harvest are constant in real terms and consists of the following: – Harvesting and processing (oil extraction) costs, estimated at \$76,000 per hectare; and – Marketing and sales costs, estimated at 5% of proceeds.
- (vi) The pre-tax average real rate at which the net cash flows have been discounted range between 15%-17% per annum.
- (vii) Cash flows exclude income taxes and are expressed in real terms.
- (viii) US Dollar exchange rate used 0.976 AUD (2011: 0.938 AUD)

Source: (TFS Corporation Ltd, 2012) (p.62, note 12: Biological Assets)

We believe that sandalwood income should only be included in the total value of production of the ORIA once that income is earned. According to the TFS 2012 Annual Report, harvesting of Sandalwood will begin in late 2013 from their Albany plantations (p.7), rather than the ORIA plantations. The 2011 Annual Report states that the first commercial plantations for the ORIA were planted in 1999, suggesting that ORIA sandalwood should be ready for harvesting in 2014 or 2015 based on 15 to 16 year rotation length, (TFS Corporation Ltd, 2011) with rotation length based on Public Accounts Committee (2011b).

7.3. BENEFIT-COST ANALYSIS OF THE ORIA

Figures above for gross value of production simply represent the total marketable value of various crops produced within the ORIA. These values say nothing about the profit earned by farmers and landholders. Benefit-cost analysis (BCA) is a framework used to assess the merits of a particular project on economic grounds. BCA is an important framework since it attempts to identify the net benefits of a project to society. Under a BCA framework, only the profit or value added earned by farming would be considered a benefit. This acknowledges that gross value of production figures ignore the use of resources required in the production of crops and that the use of resources is in fact a cost to the economy, not a benefit. The profit, or value, over and above costs is the truer representation of the benefits of a project.

Over the years, the Ord River Irrigation Scheme (ORIA) has been justified on a number of different grounds, typically similar in nature to the justifications outlined by Davidson (1972).

Despite peripheral justification, at all stages the ORIA has been pushed in large part due to economic concerns. The following statements highlight the economic goals of the project regarding the Ord-East Kimberley Development Plan:

The Western Australian Government's \$220 million investment in the Ord-East Kimberley Development Plan and the Commonwealth Government's \$195 million investment of Nation Building funding for the East Kimberley Development Package, are creating an exciting new economic growth centre in northern Australia. - Hon. Colin Barnett

Source: (Department of Regional Development and Lands, 2009) (p.3)

The complementary \$220 million Ord Irrigation Expansion Project investment by the State of Western Australia will contribute towards improving employment levels, economic development, wealth, participation and quality of life for the local community (including the Miriuwung and Gajerrong People), through the expansion of agricultural and horticultural land and the improvement of related infrastructure. - Hon. Gary Gray

Source: (Department of Regional Development and Lands, 2009) (p.3)

Despite such statements, no benefit-cost analysis was made available to assess the likely net benefits of the Ord Irrigation Expansion Project. Over the years, the two most comprehensive benefit-cost analyses undertaken on the ORIA are from 1964 and 1993.

In 1964, the Bureau of Agricultural Economics produced a report entitled *The Ord River Irrigation Project: A Benefit-Cost Analysis*, (Bureau of Agricultural Economics, 1964).

In 1993, Hassall & Associates produced an ex-post assessment of the ORIA from 1958/59 to 1990/91 and an ex-ante assessment of the ORIA from 1991/92 to 2020/21. We will discuss this analysis in more detail below.

BCA OF ORIA FROM 1958/59 TO 1990/91

Hassall & Associates Pty Ltd (1993) undertook a benefit-cost analysis (BCA) looking at a 'without-project' and a 'with-project scenario'.

The net present value of the 'without-project case' for 1958/59 to 1990/91 is listed below. Net present value represents the difference between costs and benefits of the project discounted over a particular time frame, in this case, 1958-1991.

Table 1: Net present value of 'without-project case' 1958/59 - 1990/91

Discount rate	Net present value
(%)	(\$1990/91 million)
0	-5.55
4	-5.35
8	-4.78

Source: Hassall & Associates Pty Ltd (1993) (p.36)

The table above shows that continuation of the status quo had the ORIA not been constructed would have resulted in costs of between \$4.78 and \$5.55 million between 1958 and 1991. This scenario was based on the continuation of extensive pastoral grazing in the region and indicates that this would have been a marginal and loss-making activity based on Hassall & Associates' estimates.

The net present value of the 'with-project case' for 1958/59 to 1990/91 is listed below. Depending on the discount rate used, the project has resulted in net losses of between \$234-497 million between 1958 and 1991.

Table 2: Net present value of 'with-project case' 1958/59 - 1990/91

Discount rate	Net present value
(%)	(\$1990/91 million)
0	-497
4	-331
8	-234

Source: Hassall & Associates Pty Ltd (1993) (p.43)

The aggregate amount of costs and benefits used to estimate the net present values in the table above are given in the table below.

Table 3: Aggregate undiscounted figures estimated by Hassall & Associates (1993)

Source	Total Costs	Total Benefits	Net Benefit
	(\$1990/91 million)	(\$1990/91 million)	(\$1990/91 million)
Private	263	277	14
Public	613	102	-511
Total	876	379	-497

Source: Hassall & Associates Pty Ltd (1993) (p.43)

As Table 3 shows, the undiscounted net benefits over the period for the agriculture sector was just \$14 million, equivalent to a 5% return over the period.

By contrast, the public sector invested \$613 million to extract benefits of just \$102 million. In other words, for every \$1 invested in the ORIA, the public has received back just 17 cents.

Hassall & Associates Pty Ltd (1993) (p.44) was not surprised by such high net losses, noting that “this finding is to be expected given the structure of the project and current low utilisation of the commanded water resources.”

However, to put this into perspective, had the government invested the amount it spent up until 1972 on public works in an interest-bearing asset earning just 2.5% annually, it would have had over \$600 million in the bank by 1992², rather than a \$511 million loss.

The table below shows the benefits and costs considered by Hassall & Associates.

Table 4: Benefits and Costs considered in 1993 Hassall & Associates ex-post analysis

	Benefits	Costs
Public	LAND LEASE PAYMENTS* IRRIGATION CHARGES* HOUSE RENTAL ENTERPRISES ELECTRICITY TOWN SERVICES	CAPITAL COSTS CONSTRUCTION STAGE 1 CONSTRUCTION STAGE 2 INFRASTRUCTURE ENTERPRISES CATCHMENT REGENERATION COTTON SUBSIDY RECURRENT COSTS IRRIGATION SYSTEM KUNUNURRA SERVICES ROADS RESEARCH AND EXTENSION
Private	PRODUCTION INCOME	CAPITAL COSTS ABATTOIR SUGAR MILL FARM DEVELOPMENT CROP ESTABLISHMENT FARM PLANT RECURRENT COSTS PRODUCTION COSTS FIXED COSTS LABOUR ADMINISTRATION WATER CHARGES

Source: (Hassall & Associates Pty Ltd, 1993b)

* Note: The ex-ante BCA undertaken by Hassall & Associates only includes land lease payments and irrigation charges under public benefits.

Hassall & Associates Pty Ltd (1993) also undertook an input-output analysis of the ORIA for the same time period. This analysis focused on the wider impacts of the project on the regional, state and national economy. In particular, this analysis looked at the impacts on the construction, agriculture, transport and tourism industries.

² Calculated based on \$376.8 million in public capital costs up until 1971/72, compounding at 2.5% annually over 20 years.

We will not discuss the input-output analysis component of Hassall & Associates because we believe that it only serves to inflate the benefits of the project without regard for costs or input constraints. The Australian Bureau of Statistics discusses the limitations of input-output analysis saying:

While I–O multipliers may be useful as summary statistics to assist in understanding the degree to which an industry is integrated into the economy, their inherent shortcomings make them inappropriate for economic impact analysis. These shortcomings mean that I–O multipliers are likely to significantly over–state the impacts of projects or events.
(Australian Bureau of Statistics, 2013)

BCA OF ORIA FROM 1958/59 TO 2020/21

In addition to an ex-post BCA, Hassall & Associates Pty Ltd (1993) undertook an ex-ante benefit-cost analysis (BCA) looking at the future period of 1992/93 to 2020/21 using three scenarios termed the continuity Scenario; the Growth Scenario and the Isolated Scenario. These scenarios were based on work done around the same time to forecast future growth for the state of Western Australia. Hassall & Associates then discussed with stakeholders the implications of each scenario for the ORIA and modelled the results. Combining the ex-post and ex-ante BCAs, Hassall and Associates calculated the net present value of each scenario for the total period of analysis, 1958/59 to 2020/21. The findings are shown in the table below:

Table 5: Cost-Benefit Analysis: Total Project, 1959 to 2021

	Continuity Scenario	Growth Scenario	Isolated Scenario
	(\$ million 1990/91)	(\$ million 1990/91)	(\$ million 1990/91)
Area of Land Developed (ha)	54,250	58,510	21,950
Net present value			
at 0% discount rate	2,606	3235	1263
at 4% discount rate	19	101	-117
At 8% discount rate	-188	-177	-203

Source: From Hassall & Associates Pty Ltd (1993b), Table 4.3, p.39.

Based on actual events since 1990/91, the scenario that is closest to reality currently is the Isolated Scenario. Under this scenario, the project had net benefits of \$1.26 billion over approximately a 60-year period. Importantly, this does not factor in further investment in the region of over \$500 million as part of the recent Ord-East Kimberley Development Plan. Nor does it factor in actual crop production levels since 1991.

An update of the Hassall & Associates analysis could have been undertaken at relatively low-cost to gain a truer picture of the ORIA in 2013 based on empirical data available for the period 1991/92 to 2011/12.

As a simple example of this, we know now that an additional \$379.50 million has been invested directly in the ORIA as part of the Ord Final Agreement in 2005 and the Ord Irrigation Expansion Plan in 2009.

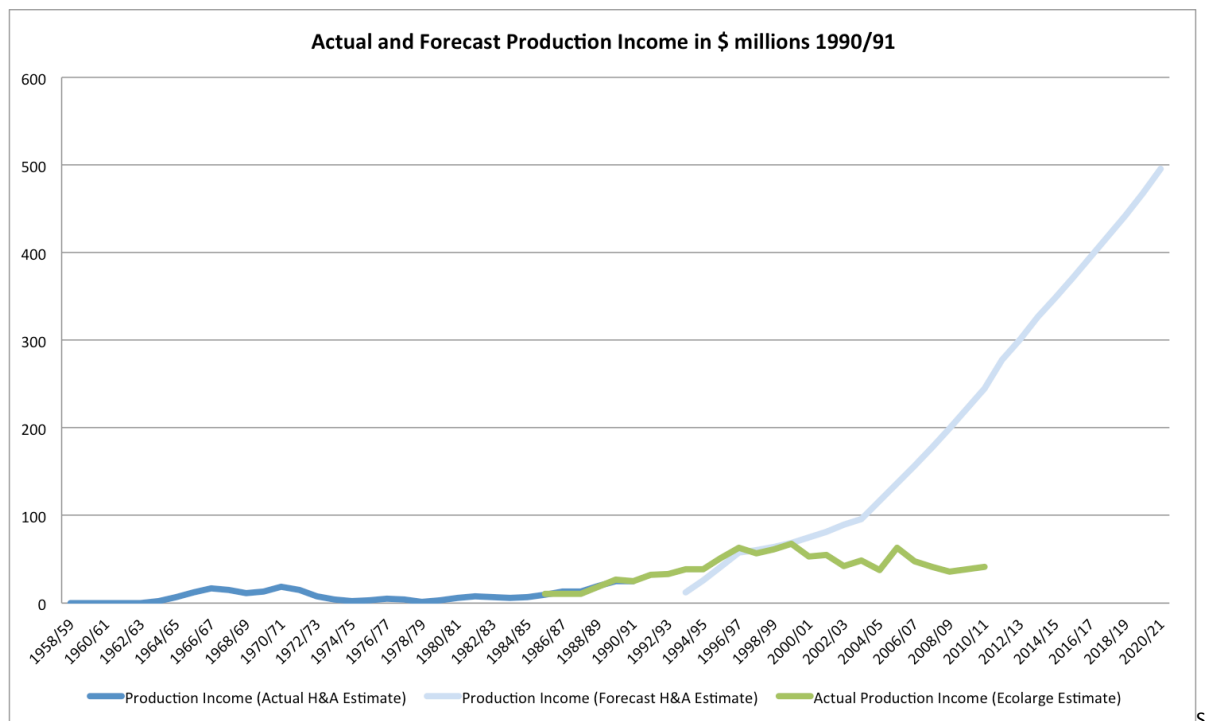
Adjusting all figures to 2012 dollars, we can conservatively estimate that around \$1.45 billion has been spent on the Ord River Irrigation Project. This does not include any farming related infrastructure investment as part of the Federally funded Ord East Kimberley Development Package. Against these costs, we have known benefits of \$14 million in 1991, adjusted to \$24 million in 2012 dollars. This ignores any profits made between 1991 and 2012 and these would need to be considered to estimate the net costs of the ORIA. Similarly, the current round of investment is presupposed upon profits being earned by whoever develops the new areas of land available.

More detailed analysis of costs and benefits would have been invaluable to the public debate about the benefits of further investment in the ORIA. Hassall and Associates (1993b) provides a template against which empirical data could have been entered and it is disappointing that the ex-ante analysis wasn't updated prior to new investment in the Ord.

7.4. FARM PRODUCTION INCOME IN ORIA FROM 1958/59 TO 2020/21

To demonstrate the importance of re-estimating the net benefits from the ORIA using real data, we have recreated actual and forecast production income from Hassall & Associates in the charts below. Note that what we called gross value of production (GVP) earlier, Hassall & Associates refer to as “Production Income”. We will use the term production income for this section to maintain consistency with Hassall & Associates.

Chart 3: Actual and Forecast Production Income in ORIA between 1958 and 2021 (\$ million 1990/91)

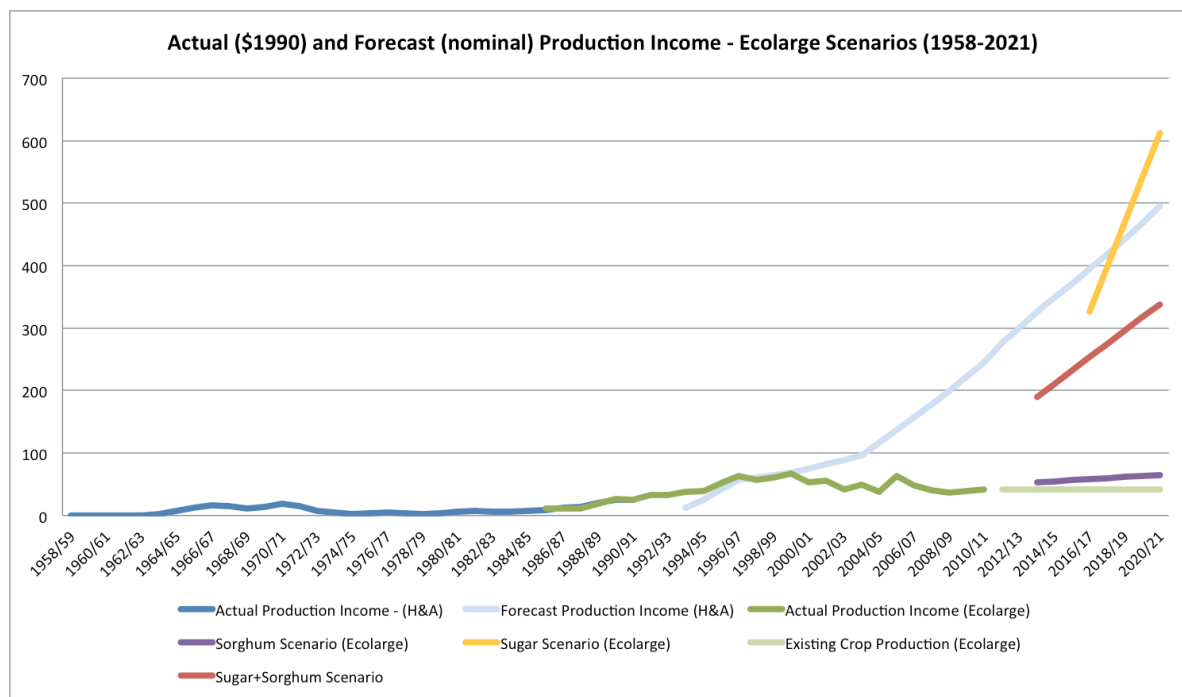


Source: Ecolarge analysis. Data available upon request.

In Chart 3 above, the dark blue line is Hassall & Associates estimate of actual crop production income to farmers in the ORIA between 1958 and 1991. The light blue line represents their forecast for the expansion of ORIA from 1993/94 onwards. The green line shows actual crop production income calculated by Economists at Large based available data. As the chart shows, actual production income has so far fallen far short of projected income. This doesn't factor in Indian Sandalwood for reasons already discussed, namely that no income has yet been realised for this use of land in the ORIA.

Looking at potential land uses in the coming years based on the Ord Irrigation Expansion Project, we can make some rough estimates at what the future might hold for the ORIA. These are meant as very rough guesses at future scenarios based on very limited information. Nevertheless, they can be used to assess observed future performance of crops in the ORIA.

Chart 4: Actual in \$/1990 and Forecast (in nominal) production income based on Ecolarge Scenarios



Source: Ecolarge analysis. Data available upon request.

The chart above shows known production income data in the dark blue and dark green lines. The light blue line shows Hassall & Associates forecast for future growth in production income. The light green line represents our estimate of future production income for existing farms in the Ivanhoe and Packsaddle districts. The yellow, red and purple lines represent estimates for potential production income based on expansion within the Weaber Plains, Knox Plains and Packsaddle district as part of the Ord River Expansion Project. These estimates are based on what is currently known about Kimberley Agricultural Investment’s plans for the new areas. The purple line shows the total income if sorghum production is pursued. The yellow line shows the total income if sugar production is pursued. The red line shows the total income if half of the new area is used for sorghum and half for sugar.

7.5. ANALYSIS OF FARM RETURNS

Preceding sections have discussed figures for gross value of production (GVP) or production income. These are useful figures for understanding the magnitude of an activity, but they say nothing of the profitability and the rate of return.

Profitability and rate of return are central to understanding the net benefits of agriculture in a particular region. And economic viability rather than technical feasibility of crops is what ultimately determines the ability to sustain agriculture in a region. Davidson (1972) stressed this point at great length regarding agriculture on the Ord River.

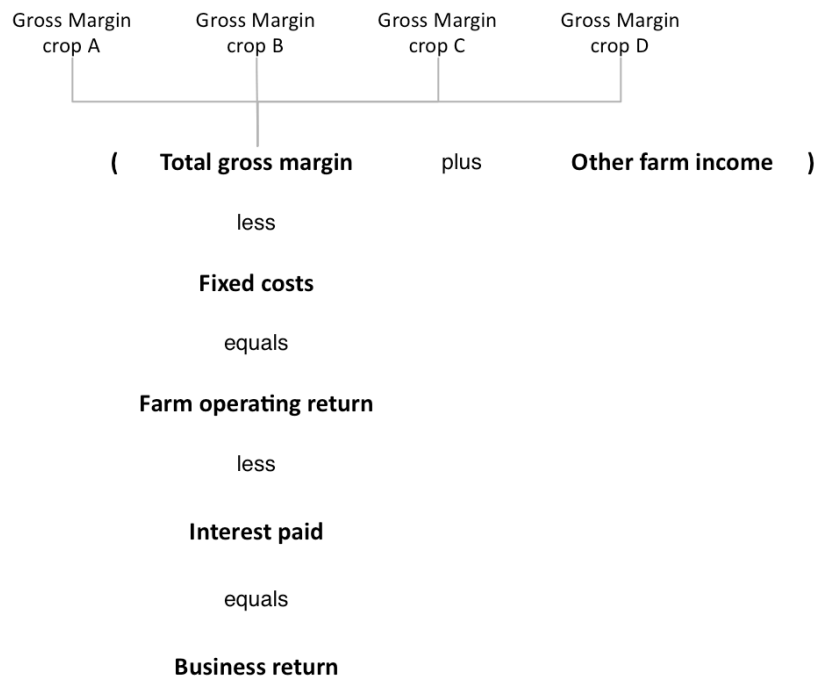
To determine profitability, the Queensland Department of Primary Industries & Fisheries recommends the following steps:

1. Create a profit budget to estimate the *operating return*.
 2. List and value all on-farm assets.
 3. Calculate *return on assets* by dividing the operating return by the value of farm assets.
- (QLD DPI, 2004) (p.14)

OPERATING RETURN

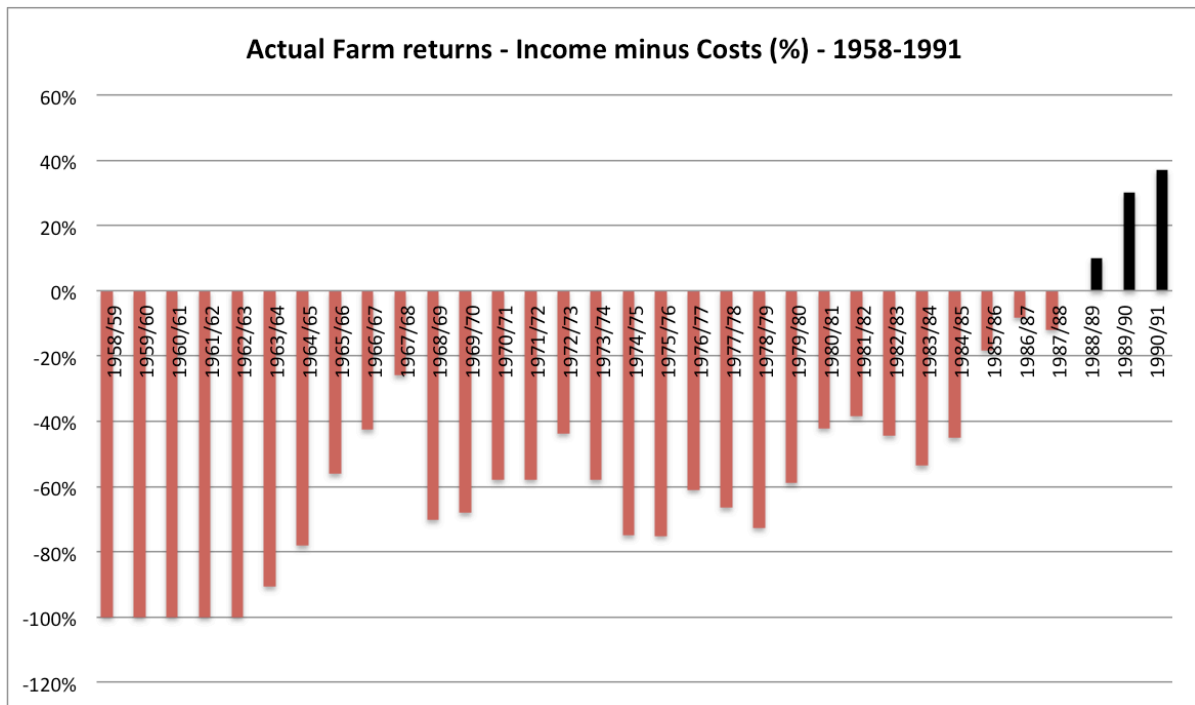
The steps required to calculate operating return are shown in the diagram below.

Figure 1: Process for calculating farm operating return



Analysis by Hassall & Associates (1993) suggests that ORIA farmers only earned a positive return in the final three years of the period between 1958 and 1991. The percentage returns estimated by Hassall & Associates are shown in the chart below. No data on farm returns was publically available for years after 1990/91 for analysis in this report and it is unclear what returns have been since. Analysis of returns from growing mangoes in the Northern Territory indicated that returns for larger high yielding farms could be between 15 and 19 per cent, (Ngo & Owens, 2002). It is unclear how profitable other crops may be and how different the cost structures and yields are between the ORIA and areas analysed by Ngo & Owens. Individual crop profitability in the ORIA remains an area for further research.

Chart 5: Chart of Hassall & Associates farm returns between 1958 and 1991



Source: Based on Tables 4.4 and 4.5 from (Hassall & Associates Pty Ltd, 1993a)

GROSS MARGINS

Gross margins are an important part of farm returns. Gross margins are calculated as gross revenue *minus* variable costs and are a simple way to assess crop profitability.

QLD DPI (2004) suggests that for fruit crops, many of which are grown in the ORIA, the cost of growing the crop accounts for just 30 per cent of the total variable costs with harvesting, packing and marketing making up the remaining 70 per cent. The QLD DPI reports that the distribution of variable costs for growing vegetables is roughly similar.

On the revenue side, yield per hectare and price per unit are the two variables that most significantly affect gross value of production. This is demonstrated in the table below showing estimated gross margins under various combinations of price and yield.

Table 6: Gross margin matrix for sugar in QLD

		Sugar price (\$/t)					
		190	200	210	220	230	240
Yield cane (t/ha)	80	-127	-58	10	78	147	215
	85	-42	30	103	176	248	321
	90	42	119	196	273	350	427
	95	126	207	289	370	451	532
	100	211	296	382	467	553	638
	105	295	385	474	564	654	744

Source: (QLD DPI, 2004)

Marketable yield is another factor to consider and refers to the percentage of output that meets quality expectations for marketing agents. It is the nature of agriculture that some crops will have blemishes that reduce the value paid by intermediaries and ultimately, consumers.

We have not attempted to undertake an exhaustive study of gross margins for crops grown in the ORIA at this stage. This analysis would be important because it would give a better indication of the economic viability of farming in the region, *vis-à-vis* other regions that can produce similar crops.

8. CONCLUSIONS

Over 40 years ago, the economist Bruce Davidson discussed the importance of asking some basic questions about developing northern Australia. These questions remain as valid as ever, especially in light of our analysis of the Ord River Irrigation Area (ORIA).

Recent years have shown that small volume, high margin fruit, vegetables and niche products may be viable within the ORIA, though the region remains broadly reliant on tacit government support, as shown by the latest investment of over \$300 million in the Ord Irrigation Expansion Project.

There is little doubt that the Ord River Irrigation Area has benefited people in the immediate region. Though this simply reflects a shifting of resources and not necessarily an increase in the size of the pie. Analysis of farm returns rather than gross value of production is essential if we are to understand the true viability of agricultural industries.

With renewed calls to develop northern Australia and the release of the socio-economic component of the Flinders and Gilbert Agricultural Resource Assessment due late 2013, we believe these issues are as important to understand as ever. If not, it is likely that we may see further investment in areas that are superficially appealing but fundamentally uneconomic. Such investment will come at the expense of alternative development options that could provide more viable livelihoods and a better use of public money.

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