

SH. MARK
IAMI
6.31.7.3
6935
FAR - C2
C. NO. H

Short Report Series
on
Locally Managed Irrigation

Report No. 2



LIBRARY

**PRIVATIZATION OF IRRIGATION
SCHEMES IN NEW ZEALAND**

Peter J. Farley

February 1994

H 14112 C2

Program on Local Management

INTERNATIONAL IRRIGATION MANAGEMENT INSTITUTE

Purpose of the Series

The *Short Report Series on Locally Managed Irrigation* is designed to disseminate concise information on the role of local management in irrigation and irrigation management transfer or turnover experiences and policies. The Series is distributed worldwide to a broad range of people — policymakers, planners, researchers, donors and officials in both public and nongovernmental organizations — who are concerned with the irrigated agriculture sector. The goal of the International Irrigation Management Institute (IIMI) is not to promote policies such as irrigation management transfer, but to enhance the knowledge base available to decision makers and advisors as they face questions of policy adoption and strategies for implementation.

The title of the Series was recently revised due to suggestions from Network members who saw the need to broaden the scope of the Series to also include issues of the sustainability of locally managed irrigation and support systems.

Locally managed irrigation can be of many types, such as traditional farmer-constructed diversion or tank schemes, indigenous and often new lift irrigation, government-constructed but farmer-managed irrigation systems and systems where management is or has been transferred from an outside agency to a local user organization.

By “irrigation management transfer” we mean some degree of transfer of responsibility and authority for irrigation management from the government to farmer groups or other nongovernmental entities. This generally involves contraction of the role of the state and expansion of the role of the private sector and water users in irrigation management. In other words, there is a shifting upstream of the point where management responsibility and control of the water supply is transferred from the irrigation authority to local management. This may involve changes in policies, procedures, practices and the performance of irrigated agriculture. It may or may not involve “privatization” of ownership of the assets of the irrigation system. The *Short Report Series* addresses questions such as the following:

What are the necessary conditions which support viable locally managed irrigation?

What socio-technical conditions, institutional arrangements and change processes lead to sustainable locally managed irrigation?

What is the range of different models that are being applied worldwide for turnover or transfer of responsibility for local management for recently developed irrigation?

What are the effects of management transfer on the productivity, profitability, financial viability, equity, efficiency and sustainability of irrigated agriculture?

What are the perspectives of farmers, managers, policymakers, urban consumers and other stakeholders in irrigated agriculture about irrigation management transfer?

What adjustments in government may be needed as a result of turnover to provide support to locally managed irrigation systems and to improve productivity in the public sector?

The *Short Report Series* is produced by the **Program on Local Management of the International Irrigation Management Institute (IIMI)**. Support for the Series is provided by Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH through the Privatization and Self-Management of Irrigation Project (No. 91.7860.9-01.288). Individuals wishing to contribute to the Series or otherwise correspond about the Series, are invited to direct communications to the editors of the Series:

Dr. Douglas Vermillion or Dr. Sam H. Johnson III,
Program on Local Management, IIMI,
PO Box 2075, Colombo, Sri Lanka.
Fax: 94-1-866854; Telex: 22318/22907 IIMIHQ CE;
E-Mail: IIMI 157:CGI129; Telephone: 94-1-867404.

Privatization of Irrigation Schemes

In many countries, irrigation management transfer (IMT) involves the transfer of operation and maintenance (O&M) responsibility from a public irrigation authority to a local management organization. Quite often, as the assets of the irrigation system, including the land, belong to the government, actual ownership of the infrastructure must remain with the government, even though the local management organization is responsible for O&M.

However, a few countries are involved in IMT 'programs that lead to complete privatization of irrigation scheme assets. The vast majority of these programs involve public pump irrigation such as the Salinity Control and Reclamation Project (SCARP) privatization program in Pakistan and ongoing deep tubewell privatization projects in various states in India and in Bangladesh.

Due to complex public versus private ownership issues, it is much more unusual to find a program where the government is privatizing public surface irrigation schemes. One such example is privatization of large-scale public irrigation systems in New Zealand. This program is unique in that the government established a value on the assets and then sold the irrigation schemes to the water users.

Within this short report, the section on the sale process is extremely interesting as it details the complexities of such a public ownership to private ownership sale. In the sale process, the following aspects were particularly important: (1) the need for new legislation giving the government the power to dispose of ownership of the schemes, (2) the inclusion of water rights as one of the scheme assets, (3) the determination of sale prices for the scheme assets, and (4) the government's willingness to protect the new owners from future dam safety legislation.

The ability to provide timely information about such an important aspect of local management of irrigation is the reason the Short **Report Series** was created. The editors welcome comments and reactions to this and other reports in the Series.

PRIVATIZATION OF IRRIGATION SCHEMES IN NEW ZEALAND

Peter J. Farley¹

BACKGROUND

Physical Setting

New Zealand lies in the southwest Pacific Ocean and consists of two main islands and a number of smaller islands which cover an area of some 270,000 square kilometers. The country is long and narrow and very mountainous, with less than a quarter of the land below 200 meters above sea level. It has a population of 3.45 million people and has traditionally been very dependent on its agricultural industry. Agricultural products constitute nearly 60 per cent of New Zealand's export earnings.

Of the 17.45 million hectares of land currently in use, some 13.7 million hectares are used for grazing, with only 0.29 million hectares planted for cropping and horticultural use. In 1988, New Zealand had 234,000 hectares of irrigated land, of which some 45 percent was supplied by government constructed irrigation schemes. The remainder was largely private irrigation consisting of individuals or small groups of (up to six) irrigators using primarily groundwater. Of the 49 irrigation schemes then under government ownership, nine were situated in the North Island and 40 in the South Island. The South Island irrigation schemes fell into two broad geographic groups — Canterbury and Central Otago — with quite distinct geographic, climatic and land-use conditions. Accordingly, the types of irrigation use are different in all three broad locations.

Agricultural Context

North Island

About 2 percent of the total land previously irrigated by government schemes is in the North Island — approximately 2,270 hectares — in irrigation schemes. Irrigated land use in the North Island schemes is predominantly horticultural (see Annex 1). Recent years have seen an increase in the production of fruit and fruit products, most notably in the production of kiwi fruit. Irrigated land in the North Island is made up of relatively small blocks with an average horticultural scheme being some 90-100 hectares in size. The soil in irrigated areas is generally of high quality. The whole North Island area typically experiences a mean rainfall in the range

1 Consultant, Frame Group, engaged by the New Zealand Treasury to manage the privatization process.

of 1,200-1,800 mm. Seasonal rainfall does not vary greatly from year to year, but there are frequent critical seasonal deficits.

The main types of irrigation systems used in the North Island are spray and trickle irrigation. Spray or sprinkler irrigation has been used for many years and because of the poor efficiency of water-use and labour intensity involved in shifting irrigation pipes there has been a trend in sprinkler irrigation systems towards mechanization; a substitution of capital for labor? Trickle irrigation systems have been installed mainly on kiwi fruit, citrus, grape and pip fruit³ crops. Most of these fruit crops are dependent on shelter belts, and trickle irrigation of shelter belts has doubled the growth rate of these in the first few years. Traditional dripper systems are reliant on soil characteristics for good water distribution, although such soils are not widespread in New Zealand. However, technological developments have allowed trickle systems to be used on shallow and high infiltration rate soils.⁴

South Island (Canterbury)

Land use in the Canterbury region is predominantly pastoral (see Annex 1). Irrigated blocks of land are much larger than those in the Central Otago region, with an average block size of approximately 2,000 hectares. The Canterbury region has soil of a medium quality. While the mean annual rainfall for the Canterbury region totals less than 800 mm for the northern and central Canterbury areas, and less than 600 mm for southern Canterbury, areas nearer the coast often experience mean annual rainfalls between 400-600 mm. Irrigation becomes profitable when the mean annual rainfall is less than 750 mm. Spring is often the driest season of the year and summer the wettest.

The Canterbury region accounts for some 18 of the previously government-owned irrigation schemes. Because of the pastoral nature of this area the main types of irrigation schemes used are spray systems and border-dykes. As a method of surface irrigation, border-dykes have been shown to be the most efficient method with respect to water use and labor: a well-designed border-dyke irrigation system irrigates at about 65 percent efficiency. Labor requirements for this type of irrigation system are now minimal due to automation?

South Island (Central Otago)

Irrigated land in Central Otago accounts for about 25 percent of the total area of land in New Zealand irrigated by government schemes. Approximately one half of the irrigated acreage is used for sheep grazing. A comparatively small amount of irrigated land is used for horticultural production which consists of mainly stone and pip fruits (see Annex 1).

The Central Otago region has 17 irrigation schemes largely developed from water races originally constructed for gold mining. Blocks of irrigated land are reasonably small with variable soil quality. Central Otago has a semi-arid climate with frosty dry winters and prolonged hot dry periods during summer and autumn. Mean annual rainfall has a range of

2 Ministry of Agriculture and Fisheries, December 1989. *New Zealand Community Irrigation Schemes: Historical Accounts up to the Completion of the 1987/88 Irrigation Season*, Wellington.

3 Pip fruit in the North Island irrigation schemes consist of apple, pear and nashi pear crops. Pip fruit in Central Otago consists mainly of apple crops.

4 Ministry of Agriculture and Fisheries, December 1989. *New Zealand Community Irrigation Schemes: Historical Accounts up to the Completion of the 1987/88 Irrigation Season*, Wellington.

5 *ibid.* p. 21.

250 to 600 mm with summer being the wettest season. Farming systems in this region are dependent on irrigation for three main reasons: extensive sheep and cattle grazing on hill country where winter feed is the limitation; intensive sheep and cattle grazing which depend on water for summer feed production; and orchard production of predominantly stone and pip fruit.⁶

The irrigation schemes use either spray irrigation, border-dyking or wild flooding as methods of irrigation. Wild flooding involves the use of contour races with sills that allow the water to overflow down the hillside at regular intervals. This system is very dependent on the lie of the land for efficient irrigation, and consequently only has about 20 percent overall efficiency.

Historical Development

Using facilities originally developed for mining, private irrigation began in New Zealand during the late 1800s in Central Otago. Government involvement began with the government financing the construction of 12 schemes in Central Otago between 1910 and 1935 (see Annex 2). After 1935, government-financed construction of irrigation projects was extended to other areas of the country. Significant increases in government-irrigated acreage occurred in the 1930s, and again in the 1960s and 1970s. The increase during the 1930s was a result of depression public works programs. A second increase in irrigated acreage during the 1960s and 1970s is attributable to a greater awareness of the value of irrigation due to several severe droughts during that period, concurrent with active promotion of irrigation construction, operation and management by government agencies. Since 1960, the government has supported the construction of 26 new irrigation schemes designed to irrigate 73,000 hectares.

The government eventually constructed a total 40 irrigation schemes in the South Island and 9 in the North Island.

Rationale

The rationale for government involvement in irrigation development in New Zealand was similar to that in both the United States of America and Australia. Irrigation investments were considered too large and investment horizons too long for individuals acting alone, while the development of the projects was seen to provide employment and an increase in agricultural production.⁸ This rationale is at variance with the fact that a larger area was developed by the private sector without subsidy, albeit in generally smaller scale schemes. Such incongruity did not, however, deter government planners.

6 Ministry of Works and Development, August 1989. *The Older Central Otago Irrigation Schemes. Working Party Report*, Alexandra.

7 Depression refers to the period of worldwide economic depression during the 1930s.

8 Wahl, R.W. 1989. *Markets for Federal Water, Subsidies, Property Rights, and the Bureau of Reclamation, Resources for the Future*. Washington D.C. and Powell, J.M. 1989. *Watering in the Garden Stole: Water, Land and Community in Victoria 1834-1988*, Allen and Unwin.

Economic analysis played little or no role in the construction of the early schemes, and later schemes were often justified by overly optimistic estimates of project agricultural benefits and underestimates of construction costs. For example, the economic analysis used to justify the nine North Island horticultural developments projected a significantly higher level of kiwi fruit prices than could be sustained⁹ Lower product prices now mean that many of the horticultural irrigation projects are, at best, only marginally economically viable. As a result of the decline in prices and the time scale involved in the approval and construction process (in many instances this can be a period of between 10 and 25 years), the development of irrigable acreage within these projects has also fallen considerably short of the development anticipated when the projects were in the design and planning stages. Only about 40 percent of the total irrigable area within the horticultural schemes approved by the government for construction since 1980 was being irrigated in 1990. The result was that water sale revenues were dramatically less than forecast and unit operating costs considerably higher.

Role of the Ministry of Works and Development

From 1912 until 1987 the Ministry of Works and Development (MWD)¹⁰ had responsibility for the design, construction and operation of government-owned irrigation schemes as well as responsibility for recommending annual water charges to the Minister for approval. Over its history of involvement with irrigation, the primary objective of the MWD became to continue constructing new or upgrading existing schemes to sustain its design and construction force. Continued irrigation was perceived to be in the “national interest” and was pursued by the MWD to the extent that financial viability of schemes was a secondary concern.”

At approximately the time the decision was made to sell the schemes, a separate decision was made to change the MWD from a government department to a State-Owned Enterprise¹² (Works Corporation). Responsibility for administering the existing schemes prior to sale was transferred to the Ministry of Agriculture and Fisheries. Responsibility for the sale process was allocated to the New Zealand Treasury.

Irrigation Subsidies

The Public Works Act 1910¹³ (the Act) provided the authorization for construction of the first publicly financed irrigation schemes in Central Otago. The Act provided that 100 percent of the off-farm construction costs were paid by the government, although the annual water charges paid by farmers were supposed to cover operation and maintenance (O&M) costs plus the interest costs associated with one-fourth of the capital. Contracts were supposed to be

9 NZ\$ 40,000 per hectare Gross Margin, (1989, at which time NZ\$ 1 = US\$ 0.60).

10 At various times known as Public Works Department and Ministry of Works. In addition to constructing irrigation projects the MWD designed and built other public works projects.

11 Audit Office 1987. *Ministry of Works and Development: Irrigation Schemes*. Wellington.

12 A Government owned company operating on a fully commercial basis.

13 The number after the title of an Act is the year in which it came into force.

non-adjustable agreements between individual irrigators and the government, but this made no provision for costs above budgeted estimates, or for inflation which reached levels of up to 18 percent during the 1980s. In general, these contracts were not adjusted until 1973 when the government decided to increase water charges by 20 percent per year until O&M charges, including substantial accumulated deficits, were covered (see Annex 3).

Prior to 1975, on-farm distribution works were not funded by the government. From 1975 to 1978, the government provided a 33 percent grant for on-farm works. This increased to 50 percent in 1978. The government also funded all investigation and design costs throughout the 1912-1986 period. These costs were not included in total scheme construction costs.

All government subsidies to new irrigation schemes were ended in 1987. However, schemes which were approved-in-principle at that time have been allowed to proceed although the form and amount of government subsidy has been modified in the sales process (e.g., the Earnscliffe scheme sale).¹⁴

Reasons for Government Divestment

Of the economic reforms beginning in 1984, the primary focus was on the agricultural sector and virtually all agricultural subsidies were removed.¹⁵ In 1987, the government decided to end all subsidies for irrigation (except subsidies on those schemes that were currently committed for construction or approved-in-principle) and to sell all the schemes. This decision followed a 1987 report by the Audit Office¹⁶ which highlighted many of the problems inherent with government ownership and management of irrigation schemes. Primary among these problems was a lack of financial and operational accountability on the part of the MWD. Water charges were often set too low to recover O&M and capital costs, irrigators played little role in the operational decisions that directly affected the magnitude of water charges they faced and benefits they received from the project. Furthermore, it was difficult to determine whether the nation had benefited from investing in irrigation.

Selling the schemes to the users was seen as the best way to increase the efficiency of their operation. It was also recognized that sale of schemes would remove the significant future liabilities the government would have faced associated with the construction of new schemes and refurbishing older schemes. For example, it was estimated that the minimum costs to rehabilitate the Central Otago schemes to a safe minimum standard was NZ\$ 50 million.¹⁷

A number of different sale options were considered: sale to irrigators, sale to a state-owned enterprise, sale to local government, sale to other parties, continue government ownership, or closure of the schemes. Government decided to sell the schemes on the basis that:

14 A refurbishment and extension proposal was being considered at the time of the Earnscliffe sale. The sale agreement included a NW 3.3 million payment to the irrigators to upgrade the scheme in lieu of the proposed NW 14.5 million government scheme, (1989, NZ\$ 1 = US\$ 0.60).

15 Sandrey, R. and R. Reynolds, 1989. *Fanning Without Subsidies: New Zealand's Recent Experience*. Ministry of Agriculture and Fisheries, Government Print Books.

16 Audit office, 1987. *Ministry of Works and Development: Irrigation Schemes*, Wellington.

17 Lewthwaite, W.J. and G.N. Martin, September 1987. *Review of Existing Community Irrigation Schemes in New Zealand with a View to the Future*, prepared for the Minister of Works and Development, Wellington.

- * the schemes were to be sold on a “commercial” basis;¹⁸
- * preference be given to selling the schemes to irrigators, because of political and monopoly issues; and
- * if irrigators were not interested in purchasing the scheme then the government would sell the scheme to others on terms not better than those offered to the irrigators.

This sale strategy was essentially an attempt to maximize the efficient use of the irrigation assets and water resources within perceived equity and regulatory restraints.

Perceptions of Stakeholders

As a stakeholder in the irrigation schemes, government faced a situation of multiple accountabilities. On one hand, there was strong pressure from vested interests to continue developing irrigation schemes supposedly for the public good, while on the other hand, there was an obligation on them to invest taxpayer’s money wisely. Another aspect was government involvement in procedures to obtain water rights where it was required to act both as an advocate for irrigation use and as an advocate for conservation. Additionally, the process of setting water charges was politically contentious and often unrelated to financial viability.

Farmers frequently stated that the charges were set too high for farms to remain viable, while officials believed the charges to be too low to recover capital costs associated with the schemes. The whole issue regarding water charges and capital costs came to a head in **1987** when the Cabinet made the decision to privatize the irrigation schemes. At that stage irrigation schemes had come to be regarded by the government as very poor investments that involved large amounts of highly politicized decision-making.

As the government department responsible for the irrigation schemes after **1988**, the Ministry of Agriculture and Fisheries (**MAF**) also faced dual accountabilities (prior to **1988** MAF had played a purely advisory role involving advising on the economics of irrigation schemes). MAF perceived its main focus as being to provide a good service to irrigators within the constraints of prescriptive legislation. After assuming full responsibility for the schemes in **1988**, MAF encountered some difficulty with the newly corporatized Works Corporation in their contractual responsibilities with respect to the consultation process with irrigators. Works Corporation saw their responsibilities more in terms of the specific requirements of the management contracts, whereas MAF expected the corporation to undertake vaguely specified consultation in a typical bureaucratic substitution for real accountability. Irrigators were similarly unprepared for sub-contracted management by a commercial agency. Over the last five years, MAF has perceived their relationship with irrigators as being satisfactory although it was somewhat strained during the sale negotiation and settlement process.

In general Territorial Local Authorities opposed the sale of the schemes to users and advocated sales to themselves. This was universally opposed by users. Farmers’ responses to the **1987** proposal to sell the irrigation schemes varied initially. While farmers in some

18 Based on expected cash flows to government under continued government ownership.

schemes were very keen to purchase, others were concerned that the sales were an attempt to foist liabilities on them, especially in light of the substantial levels of debt that some schemes had incurred. As settlements proceeded, however, the initial suspicions faded and the emphasis changed to the terms of sale rather than the policy of sale.

The Sale Process

The approach taken was to sell the government-owned schemes, including all headworks,¹⁹ on an “as is, where is” basis with the purchaser being given a period of statutory access rights” to enable them to complete at their own cost, matters such as the definition and registration of access rights which would otherwise have to have been done by the government.

The sale process did not involve altering the nature of the water rights held by schemes except to limit the term of any water right to its current term or to 30 years, whichever was less. Access rights were also preserved.

Irrigators were invited to indicate their interest in negotiations and were sent copies of scheme accounts, a scheme valuation model, and scheme production data. A meeting was held to discuss the data and the process by which an agreed settlement could be reached. The sale procedure provided that in the event of agreement not being reached by negotiation the parties would refer the issue to final offer arbitration. In the event that the irrigators did not wish to purchase at the arbitrated price then the government would seek other buyers at a price not less than that offered to the irrigators. Negotiated agreement was reached in all cases and it was unnecessary to use the arbitration mechanism.

Water Rights

Prior to the sale of irrigation schemes there were three types of water right in existence:

Ordinary Water Rights

These were granted by the local water authority” under the Soil Conservation and Rivers Control Act 1941 after a process of public notifications and hearings on terms and conditions as decided by the authority. Decisions could be appealed through the courts. In times of water shortage, the water authority had the power to direct reductions in use. The term of these rights was usually of the order of five years.

19 Headworks are intakes and storage structures as well as distribution structures that serve more than one irrigator group.

20 Access rights give the legal right to enter other people’s property for construction purposes or for operation and maintenance of irrigation schemes. Ensuring access rights during the sales process was particularly important to ensure that operation and maintenance procedures were able to be carried out.

21 Catchment Boards, Catchment Authorities and, since local government reorganization in 1990, Regional Councils

Government Water Rights

These were rights that the government could, in effect, grant to itself, where projects were considered to be in the national interest, without having to apply to the local water authority and without any person having rights to appeal. The term of such rights was usually in the order of **20** years.

Mining Rights

These were mining privileges in respect of water granted under the Mining Act **1926**. These were granted for periods of up to **30** years but were perpetually renewable. In effect, they were permanent property rights to water although tradeability was limited by the fact that the rights could not be sold separately from the land which they served. Mining rights were specified by volume and priority” at the time of issue.

As the schemes were sold as going concerns, the water rights were included as one of the scheme assets. There was no attempt to use the sale process to extend or modify water rights except to set a limit of **30** years on the Mining Rights. In some cases, major schemes faced applying for new water rights within two years of the sale. This issue was addressed by allowing for the expected costs of applying for renewal of the rights when negotiating the sale price.

Sale Prices

Very few of the schemes yielded a high sale price to the government (see Annex 2). The key reason for this was the low net revenue generated by the schemes under government ownership and management. Other limitations resulted from the liabilities accepted by the scheme purchasers. Government gave greater priority to transferring ownership to existing irrigators and removing the ongoing liability to fund future rehabilitation work than to achieving a high sale price. In cases where the government made payments to purchasers, the payments were generally for construction work the government had agreed to perform at some point in the future, or for refurbishment work necessary to maintain the scheme’s viability or safety.

The sale process was also constrained by a number of other significant factors. First, there was an absence of competitive bidders because schemes were effectively only sold to irrigators. This was done primarily to minimize monopoly and regulatory questions that would have arisen if schemes had been sold to a party other than the irrigators. However, if the sale process had been open to any buyer, few alternative buyers would have been likely to emerge (except perhaps local governments). This was simply a factor of the low economic value of the schemes. Secondly, the sale process was governed by political considerations and the desire of the government to signal their determination to sell the schemes. These factors combined to weaken the government’s negotiating position and lower the sale prices obtained.

22 When demand for water exceeded availability, the lowest priority users had to stop drawing water. This provided a clear self-policing system and resulted in rights being valued in line with their priority.

Other issues which were raised in the course of establishing the sale process included dam safety,²³ public access and recreation, water right terms, statutory easements, and the need to amend the definition of “natural water” under the Water and Soil Conservation Act 1967. Most of these additional issues were resolved without the need for special legislation.

The Irrigation Schemes Act 1990

Prior to the Irrigation Schemes Act 1990, the legislative basis for the government to develop and manage irrigation schemes was provided by the Public Works Act 1981. As this contained no authority for the government to dispose of its ownership of the schemes, new legislation was needed. In December 1988, government agreed to the drafting of legislation for enactment in August 1989. Owing to Legislative delays, it was July 1990 before the irrigation schemes act was passed.²⁴ However, the first irrigation scheme sale agreement was approved by government in June 1989.

The Irrigation Schemes Act 1990 (the Act) empowered the government to dispose of its irrigation schemes.” The objective of the Act was to eliminate all statutory provisions for irrigation and transfer existing rights held by the government for the operation of the schemes in a registrable form. The Act recognized that this process would take some time, especially with respect to land rights and consequently legislation allows for a five-year period from the passing of the Act for access rights to be registered. Matters provided for in the Act include authority to sell the schemes: provision for the transfer of existing registered easements and rights to the purchasers: and provision for the transfer of existing government-held water rights and privileges to the purchasers.²⁶

Performance Results of Schemes under New Ownership

The extent of the actual efficiency gains from private ownership cannot yet be determined. However, the evidence gathered to date from the few schemes that were controlled and operated by irrigators prior to sale indicates that these gains can be substantial.

23 Irrigators were concerned that future dam safety legislation (which wasn't at that stage being mooted) might not only render their schemes nonviable in a financial sense, but also impose substantial liabilities for decommissioning dams. A provision was included in all of the Sale and Purchase agreements between the government and all irrigators where significant dams were involved, to the effect that if dam safety legislation was enacted within ten years and had a materially adverse effect on the financial viability of schemes, the assets can be handed back to the government, thus leaving any residual decommissioning costs with the government.

24 Delays in passing the legislation had a number of consequences including disputes between officials and the irrigators as to their rights and obligations in the transition period (especially with respect to activities such as collecting water charges); frustration for those irrigators who had negotiated agreements in the expectation that the transfer of ownership was imminent; and some payment dates specified in sale and purchase agreements being missed. As a result of the delays, the Crown incurred penalty interest on money which it had contracted to pay irrigation companies within a set period (The Audit Office, July 1991. *The Process for Disposal of Crown Funded Irrigation Schemes*, Wellington).

25 New Zealand Government, July 1990. *An Act to empower the Crown to dispose of irrigation schemes (The Irrigation Schemes Act, 1990)*, Wellington.

26 Hansard 1990. *Irrigation Schemes Bill, Second Reading, 28 June 1990*, Parliamentary Records.

For example, the Greenstreet Scheme in Canterbury was constructed with a 50 percent government subsidy, but has been independently operated and maintained by irrigators since completion in 1975. In 1990²⁷ it had an annual water charge of NZ\$ 3.50/ha and cash reserves of NZ\$ 5.50/ha. Adjacent schemes operated by the government had water charges of around NZ\$ 12/ha and accumulated debts of the order of NZ\$ 50/ha. The Bannockburn Scheme is small and one of the oldest in Central Otago. It has been operated by the irrigators for many years. Water charges in 1990 were about NZ\$ 18/ha and it had no debts. Government operated schemes in the region had water charges of NZ\$ 43 to NZ\$ 79/ha and large debts.

The Hawea scheme was completed in 1967 and operated until 1988 by the MWD. Since the irrigators have assumed responsibility for operation and maintenance, operating costs have fallen by approximately two-thirds. The Maniototo scheme was truncated after massive cost escalations, because the estimated costs for MWD to complete the last 3,000 hectares of the scheme was NZ\$ 11.5 million. Irrigators in the truncated area were paid NZ\$ 1.5 million in compensation. They then completed the scheme themselves early in 1990 for less than NZ\$ 1.5 million.

Reports are now being received of similar results being achieved by the schemes which have been sold. There appear to be several sources of efficiency gain from direct irrigator ownership. One of the main areas for efficiency gain is in the psychology of ownership, which has meant that irrigators take personal interest and responsibility for the structures and operation of the scheme. They are also exposed to maximum incentives to control costs, recover charges and invest prudently.

Control of irrigation schemes at a local level has resulted in increased operating cost efficiency and equity.²⁸ Reviews and decisions made at the local level are more acceptable to users and have proven to be much more efficient than centrally directed programs. As well as this, the move away from government controlled water charges has meant that irrigation companies are able to operate competitively in the allocation and pricing of water as a valuable resource.

Other areas that have been noted by Treasury²⁹ as sources of potential for efficiency gains include reduced amounts of over elaborate engineering design and specification as was the case with the Maniototo example noted above: the removal of high overhead costs of government and Local Authorities; economic evaluations undertaken by the risk takers and not by a remote government agency; and removing the separation of capital fund raising and risk for the promoters. Overall, there have been substantial benefits to both the government and the irrigators.

Summary

The government role in irrigated agriculture in New Zealand has evolved from government control over the design, construction, and operation of irrigation schemes to the sale of government-constructed schemes to private parties. The primary rationale for transfer

27 At which time NZ\$ 1 = US\$ 0.60.

28 Subsidies are no longer provided to groups or individuals who are most effective at political lobbying at the expense of other producers.

29 The Treasury, 18 August 1989. *Disposal of Community Irrigation Schemes: Issues*, Appendix One. Ministerial briefing paper.

of ownership was to improve the efficiency of their operation and to reduce costs to the government. Between 1988-90, 49 government-owned irrigation schemes in New Zealand were sold to private irrigators.³⁰ The sale took place against a backdrop of wider economic reform and the elimination of agricultural subsidies.

While the sales did not produce significant revenue to the government there was a major reduction in government liabilities. Private irrigators demonstrated a willingness to take direct control and responsibility for the assets that provided them with benefits. Indications are that efficiency gains in the order of 30-50 percent are being achieved as a result of the privatization of the schemes. Further opportunities for efficiency gains now lies with the introduction of a system of transferable water rights between existing and potential users. While the water is tied to the irrigation schemes users are not forced to consider its full economic value.

Key Lessons

- * Government involvement in irrigation has not been shown to produce any net national benefit and there are strong reasons to suspect that it has resulted in a net loss of national welfare.
- * Privatization of irrigation schemes in New Zealand has produced very large efficiency gains.
- * Although irrigators were acutely aware of the frustration's and inefficiency of government ownership and management, many initially feared that they would be worse off with a loss of government support.
- * Government agencies whose existence depends on contracting and managing irrigation schemes will **not** advocate or enthusiastically support privatization. Privatization should be carried out by an independent body with authority to access information and act upon it.
- * Irrigator-owned schemes operate satisfactorily under normal commercial law and institutional forms. In New Zealand, special legislative structures and systems were not required.
- * The privatization of irrigation schemes in New Zealand has been a very successful, albeit complex, exercise.

30 Of the schemes, 41 were sold to groups (45 ordinary companies, one cooperative company and one incorporated society), one was sold to the sole user, and one was sold to users jointly who then took over individual parts.

Annex 1

Land Use on Crown-Owned Irrigation Schemes

	Sheep	Dairy	Other (beef, deer)	Kiwifruit	Cropping	Other (fruit)
North Island	0%	1%	0%	58%	0%	41%
Canterbury	55%	15%	8%	3%	18%	1%
Central Otago	87%	0%	6%	0%	1%	6%
Total Scheme Usage	67%	9%	7%	3%	11%	3%

Note: Within the areas of the irrigation schemes there is the capacity to irrigate a further 40,437 hectares. The development of this land for irrigation is limited only by the economics of such development.

Annex 2

Irrigation Scheme Valuations and Results of the Sale Process

Reference	Date of Sale/Transfer	Date of Sale/Supply	Number of Irrigators	Original Area (ha)	Currently Irrigated Area (ha)	Purchase Price (NZ\$)
1 Kerikeri	1980	1982	298	2,317	1,640	
2 Puketotara	1982	1983	17	390	combined with Kerikeri	0
3 Kapiro Punagaere	1984	1987	39	850	combined with Kerikeri	
4 Glenbrook	1986	1987	20	141	28	
5 Te Kauwhata	1984	1985	56	433	218	10,000
6 Pukerimu	1985	1986	29	651	90	7m
7 Tebuta Road	1984	1983	4	88	45	
8 Tablelands	1981	1983	45	280	185	
9 Waiau	1984	1984	6	120	53	1
10 Maungatapere [c]	1988	1990	na	1,500	150	0
11 Waimea East [b]	1981	1984	163	1,007	570	0
12 Waiau	1977	1976	80	14,541	8,000	580,000
13 Balmoral	1981	1985	25	5,243	1,840	included in Waiau
14 Waiakeka Downs	1975	1975	7	419	419	included in Waiau
15 Glenmark	1979	1983	10	818	618	
16 Lohurn	1977	1979	52	285	285	0
17 Mayfield Hinds	1935	1949	142	31,178	20,000	1
18 Rangitata Diversion Race	1936	1945	Supplies three mid-Cantorbury schemes			550,000
19 Valetta	1957	1959	49	7,385	4,500	1
20 Ashburton Lyndhurst	1936	1945	222	24,256	18,000	70,000
21 Greenstreet	1971	1975	25	2,700	2,100	350,000
22 Eiffelton	1983	1987	22	2,296	2,296	5,000
23 Levels Plain [c]	1935	1936	103	3,100	2,650	60,000
24 Lower Waitaki	1970	1974	167	15,865	14,500	0
25 Morven Glenavy	1969	1974	65	10,458	7,850	960,000
26 Redcliff	1933	1934	15	1,865	1,460	550,000
27 Maerewhenua	1975	1981	16	546	500	included in Morven Glenavy
28 Upper Waitaki	1961	1965	21	1,419	1,419	1
29 Upper Waitaki Ext	1969	1970	11	456	456	1
30 Hawea	1963	1968	18	943	943	included in Upper Waitaki
31 Tarras	1923	1925	12	723	723	0
32 Ardgour	1923/34	1923	8	495	495	0
33 Pisa Flats	1955	1956	17	1,019	1,019	included in Tarras
34 Arrow River	1926	1930	50	700	700	0
35 Ripponvale [c]	1955	1957	35	375	375	0
36 Manuhierikia	1923	1922	158	1,990	1,950	0
37 Earnsclough [c]	1924	1922	88	908	908	125,000
38 Hawkdun	1926	1929	60	3,255	3,255	0
39 Idaburn	1931	1931	6	228	288	1
40 Omakau	1962	1936	67	5,803	5,803	included in Hawkdun
41 Ida Valley	1912	1917	49	5,580	5,580	0
42 Galloway	1924	1920	28	447	447	1
43 Bannockburn	1957	1922	26	321	277	0
44 Maniototo	1975	1985	26	4,046	3,574	0
45 Last Chance	1923	1923	30	963	963	1
46 Teviot	1923	1924	49	1,386	1,386	0
47 Blackstone	1920	1920	6	300	300	0
48 Burn Cottage [d]	1990	na	9	109	na	1
49 Luggate	1920	1920	2	na	na	0
TOTAL			2453	160,198	118,858	3,274,924

na indicates data not available.

a Negative values signify payments made by the Crown to the Purchasers.

b Scheme not completed at time of sale. Ownership and obligation to complete schemes in return for payment by Crown.

c Crown approved upgrade of the scheme. Obligation by irrigators to upgrade in return for payment by Crown.

d Irrigators took ownership in exchange for the Crown agreeing to a cash payment in lieu of a commitment to complete a new scheme.

Source: NZ Treasury and NZ Ministry of Agriculture and Fisheries

Annex 3
Historic Costs and Unpaid Capital and O&M Costs

Scheme	Date of Scheme Approval	Date of Final Approval	Number of Irrigators	Historical	O&M Costs	Total	Unpaid Capital	
				O&M Capital Cost	(1987/88 NZ\$)	(1987/88 NZ\$)	and O&M Costs at end of 31/12/88 NZ\$	
1 Kerikeri	1980	1982	298	17,271,941	65,000	63,000	(3,050,000)	
2 Puketotara	1982	1983	17	158,466	10,000	7,000	(271,000)	
3 Kapiro Punagere	1984	1987	39	3,502,498	40,000	0	(1,125,000)	
4 Glenbrook	1986	1987	20	546,837	32,000	21,300	(355,000)	
5 Te Kauwhata	1984	1985	56	2,909,436	40,000	36,400	(1,302,000)	
6 Pakerimu	1985	1986	29	2,312,502	40,000	63,000	(786,000)	
7 Tebbuts Road	1984	1983	4	429,150	16,000	15,000	(211,000)	
8 Tablelands	1981	1983	45	1,550,290	50,000	70,000	(318,000)	
9 Waiau	1984	1984	16	639,237	32,000	22,000	(357,000)	
10 Maungatapere	1988	1990		Scheme sold before it was completed				
11 Waimea East	1981	1984	163	3,767,199	200,000	58,000	(1,647,000)	
12 Waiau	1977	1976	80	12,441,507	159,500	138,000	(12,124,000)	
13 Balmoral	1981	1985	25	7,704,061	57,000	0	(4,071,000)	
14 Waiareka Downs	1975	1975	7	259,000	15,200	3,700	(319,000)	
15 Glenmark	1979	1983	10	3,823,691	7,500	7,500	(433,000)	
16 Loburn	1977	1979	52	526,538	11,000	11,000	197,000	
17 Mayfield Hinds	1935	1949	142	2,805,389	375,100	486,000	128,000	
18 Valetta	1957	1959	49	521,062	90,900	97,000	(97,000)	
19 Rangitata Diversion Race	1936	1945	na	4,160,000	288,000	Redistributed among all users		
20 Ashburton Lyndhurst	1936	1945	222	1,791,799	427,100	454,500	(240,000)	
21 Greenstreet	1971	1975	25	2,036,180	Scheme operated independently by irrigators			
22 Eifellton	1983	1987	22	591,024	46,000	46,000	(173,000)	
23 Levels Plain	1935	1936	103	786,774	80,000	70,000	(210,000)	
24 Lower Waitaki	1970	1974	167	8,955,445	203,400	115,000	(2,943,000)	
25 Morven Glenavy	1969	1974	65	4,107,441	136,700	56,000	(1,048,000)	
26 Redcliff	1933	1934	15	79,412	40,000	41,000	(2,940,000)	
27 Maerewhenua	1975	1981	16	558,364	12,300	8,100	(499,000)	
28 Upper Waitaki	1961	1965	21	523,409	85,100	108,620	(262,000)	
29 Upper Waitaki Ext	1969	1970	11	121,406	Combined with Upper Waitaki		(233,000)	
30 Hawea	1963	1968	18	376,385	37,500	72,900	(430,000)	
31 Tarras	1923	1925	12	354,572	82,500	58,300	(1,534,000)	
32 Ardour	1923/34	1923	8	86,913	44,000	30,100	(598,000)	
33 Pisa Flats	1955	1956	17	199,287	52,500	53,500	(505,000)	
34 Arrow River	1926	1930	50	317,079	110,000	62,700	(1,927,000)	
35 Ripponvale	1955	1957	35	193,390	170,000	25,100	(685,000)	
36 Manuherikia	1923	1922	158	691,360	200,000	132,200	(3,168,000)	
37 Earnsclough	1924	1922	88	358,060	76,500	55,700	(988,000)	
38 Hawkdun	1926	1929	60	272,752	330,000	162,800	(3,651,000)	
39 Idaburn	1931	1931	6	19,802	34,500	11,400	(158,000)	
40 Omakau	1962	1936	67	701,677	259,000	270,300	(2,792,000)	
41 Ida Valley	1912	1917	49	740,469	311,000	200,411	(4,273,000)	
42 Galloway	1924	1920	28		combined with Ida Valley			
43 Bannockburn	1957	1922	26	14,282	2,200	2,200	(1,000)	
44 Maniototo	1975	1985	26	26,869,100	35,000	3,000	(99,000)	
45 Last Chance	1923	1923	30	248,751	121,000	54,500	(1,529,000)	
46 Teviot	1923	1924	49	212,620	146,500	100,900	(1,825,000)	
47 Blackstone	1920	1920	6	na	na	na	na	
48 Burn Cottage	1990	na	9	191,000	na	na	na	
49 Luggate	1920	1920	2	Scheme operated independently by irrigators				
TOTAL			2463	117,129,757	4,572,000	3,294,131	(58,852,000)	

na Indicates data not available.

a At current exchange rates NZ\$1 = US\$0.60

b Excludes refurbishment, other capital costs, and "non-recurring" maintenance costs. Also excludes MWD management and overhead costs, estimated to be approximately \$1-2 million per year.

Source: Ministry of Agriculture and Fisheries, 1989.