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**LOBBYING FOR LEGISLATION: AN EXAMINATION OF WATER RIGHTS TRANSITION IN
COLONIAL VICTORIA, AUSTRALIA 1840-1886**

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LOBBYING FOR LEGISLATION: AN EXAMINATION OF WATER RIGHTS TRANSITION IN COLONIAL VICTORIA, AUSTRALIA 1840-1886

This paper analyses the transition of water rights institutions in Victoria, Australia, between 1840 and 1886. It will focus on the shift from the common law doctrine of riparian rights to government control of water supplies via quasi-government organisations known as irrigation trusts examining factors leading to this transition and whether it increased institutional efficiency. Evidence suggests transition to government control resulted from two factors. First, the decreasing costs of using government relative to costs of private redefinition because settlement numbers increased thereby increasing scarcity while adding to costs of private investment in redefinition due to higher negotiation and enforcement costs, legal uncertainty, and the inability for private actors to capture the full benefit of a transition. In this way, transition was efficient as it lowered transaction costs associated with creating irrigation schemes to provide water supply security. Second, crisis of drought that increased in magnitude over the period due to changes in dominant farming methods from land extensive grazing to land intensive crop farming. Drought escalated demands, via lobbying, for government action. Combined, these two factors explain why an efficiency enhancing transition from riparian rights to government control took place at this juncture in Victoria's history.

Analysis of the historical evolution of property rights to water in Victoria is decidedly absent from both economics and history literature. While a number of authors have made reference to Victoria's historical water institutions, there has been little investigation into how and why these institutions evolved and whether the evolutionary path followed led to the creation of more efficient arrangements over time.¹ This paper aims to fill part of this gap via analysis of the evolution of water rights in Victoria from 1840 to the passing of the 1886 Irrigation Act employing the theoretical framework developed by new institutional economists that provides a basis for examination of property rights transition that can promote natural resource use efficiency while adding to long run economic growth.² In this way, this investigation will not only provide a deeper understanding of Victoria's water rights evolutionary path, but also contribute to the wider institutional literature.

The period examined saw a transition away from the British common law doctrine of riparian rights to government control of water supplies via quasi-government organisations referred to as irrigation trusts. Evidence suggests the transition to government control was a result of two factors. First, decreasing costs of using government compared with private definition costs resulting in an increased demand for the government alternative.³ In this way, the transition was efficient as it lowered transaction costs associated with creating irrigation schemes intended to increase water supply security, maintain a large rural population, and build a viable agricultural sector to support economic development while overcoming inefficiencies of the riparian doctrine

that was inherently unsuited to Victoria's arid environment. While future institutional changes eroded initial efficiency gains by retaining government ownership when full private ownership would have yielded increasing economic benefits these early efforts to create institutions that supported economic development were efficient.⁴ Second, crisis, in the form of extreme drought, reinforced demands for government action. During the period examined here drought occurred in 1857-1858, 1864-1866, 1877-1878, and 1880-1886. In turn, changes in land policy over a similar period increased the number of small, capital poor farmers in the more arid regions magnifying the impacts of drought and the crisis it created.

The data used here are from both primary and secondary sources. Primary sources include government reports such as Royal Commission, legislation, and census data as well as regional and colony-wide newspapers. By the 1880s Victoria had over 200 newspapers and journal in circulation providing a rich source of information regarding the issues and challenges of colonial life. In this way, they are an important source of data for understanding factors promoting a water rights transition during the period being examined. Secondary data are from various authors investigating aspects of Victoria's colonial history including, land policy, the political and legal system, and predominant water uses and institutions.

This paper is arranged as follows: section two provides a brief literature review. Section three discusses the nature of settlement in Victoria's from 1840 to approximately 1860 and the functioning of the riparian doctrine. Section four outlines the shift in settlement policy during the 1860s, prompted by the end of the gold rush, as the precursor to more substantial changes in water rights during following decades. Section five analyses the main factors leading to institutional transition in water rights during the late 1870s until the Irrigation Act (1886) and examines whether this shift was efficient. Section six gives some concluding remarks.

II PROPERTY RIGHTS LITERATURE

The evolution of property rights is the subject of a growing literature aimed at providing a theoretical framework to analyse the path of economic growth in different regions within countries and countries themselves.⁵ Such analysis can provide a deeper understanding of how institutional choices made in different historical periods affect an economy's performance and income distribution via impacts on efficiency (Libecap in Anderson and McChesney (eds.), 2003). Property rights are endogenous and dynamic, and evolve in response to changes in technology, relative factor scarcity, and state behaviour (Anderson and Hill, 1975: 165; Anderson and Hill in Anderson and McChesney (eds.): 119). In Anderson and Hill's (1975) framework these factors act to shift the marginal benefit and cost curve that determine the amount of investment in the activity of property rights definition where the sum of marginal benefits is determine by the ability of actors to capture

the full stream of rents created by a new set of property rights and marginal costs are determined by the amount of resources and their opportunity cost needing to be invested to affect the change. For instance, as population increased in the more arid areas of Victoria due to government land policy changes, water became relatively scarce thereby adding to the benefits of replacing the riparian doctrine that restricted use rights to a smaller number of land holders. In turn, this shifted the marginal benefit curve to the right, encouraging increased activity in a reorganisation of water right. While cost-benefit analysis provides a method to understand why investment in activities for creation or redistribution of rights take place at certain junctures in history, the form this action takes will primarily rely on the level of transaction costs.

Transaction costs influence two key factors crucial to institutional change. First, the likelihood that collective action will take place. Collective action will be more likely if transaction costs are low. Lower transaction costs occur when groups are small, geographically proximate, and homogenous.⁶ Nevertheless, the optimal size of the group is dependent on the size of the geographic area requiring exclusion and scale economies in defence. In this way, a larger area will require a larger collective action group to institute effective change. Second, they determine whether collective action efforts remain private, thereby altering institutional frameworks from the bottom-up or whether these activities enter the public sphere where groups lobby government to effect institutional change for them. When private costs are high, collective action will be in the form of lobbying. Private costs will increase in line with decision, defence, violence, and racing costs.⁷ Decision costs are those costs associated with negotiation which will be higher the more heterogenous the group involved. Defence costs include costs of subsequent enforcement of a new property regime that increase with the size of the exclusion area. Violence costs are those costs involved in an individual engaging in violent acts to take more rights than available to them under the private rights arrangement. Racing costs occur where people rush to exploit resources before others thereby maximising the rents associated with privatisation of rights. In turn, the higher these costs, the higher the costs of private definition creating an incentive for demands for government action which minimise any, or all, of these costs. For instance, private reorganisation of water rights in Victoria became more costly as changes in land legislation increased relative scarcity while adding to the heterogeneity of bargaining parties thereby leading to demands for government action to overcome these costs. In addition, demand for government action will also be influenced by conditions of crisis such as, war when extension of government control may result in the outright replacement of the market mechanism.⁸

III SQUATTER SETTLEMENT AND RIPARIAN RIGHTS

Victorian settlement expansion accelerated after approximately 1830 prompted by an increase in the number of free settlers entering the colony. These settlers quickly moved into the less

populated interior in search of agricultural land for sheep grazing. By the end of that decade, successful exploration over mountain ranges into Victoria uncovered some of the richest pastoral land in the country. The subsequent population movement was rapid as settlers rushed to claim as much of this area as possible in order to graze sheep and capitalise on the increasing value of Australian wool on British markets.⁹ As a result, most land in Victoria was fully occupied by the early 1850s.

Due to extreme climatic variations, characterised by constant, crippling drought, securing blocks with water access was a crucial determinant of initial settlement patterns. While drought increased the value of water frontage blocks for squatters, so too did the operation of the common law of riparian rights.¹⁰ The riparian doctrine dictated only those owning land that came in contact with the water source could acquire riparian rights. Water use activities under this common law were determined by the reasonableness doctrine. The condition of reasonableness meant that in activities deemed 'ordinary' under the doctrine, that is domestic and stock use, riparians use was unrestricted. However, in any other activities, such as irrigation, deemed 'extraordinary' a riparian was required to ensure water flowing to lower riparians was unaffected in both quality and quantity. In this way, riparians were equal in both right and obligation and subject to constraints determined by their being part of the 'community of the river.' While there is little dispute the riparian doctrine was an inherently inefficient institutional framework for arid environments having the potential to result in resource wasting violence like that which occurred in the Riverina district of New South Wales in the 1860s, there is no evidence of water disputes, either violent or non-violent, in Victoria during its operation.¹¹ Nor is there evidence that squatters attempted to replace this doctrine as occurred in the more arid regions of the western United States (US) during a similar period. In terms of the efficiency gains that would have been captured with a transition toward private property rights; this lack of evolution is surprising. Nevertheless, this can be explained via examination of marginal costs and benefits accruing to investors in allocating resources to institutional change.¹² Evidence indicates lack of investment in definition and enforcement activity resulted because costs far outweighed benefits that could be captured by this group of settlers. Instead, high costs of definition led squatters to invest in three methods to reduce costs of drought and inefficiencies of the riparian doctrine. In turn, the full benefits of these investments were able to be internalised.

First, and foremost, squatters' dominant economic activity, sheep grazing, gave them inherent mobility advantages, decreasing costs associated with regional drought and the inefficiencies of riparian rights. While moving their flocks' large distances during drought was costly, it was less costly than attempting to negotiate and enforce contracts to effect a change in water rights over a small but dispersed population. In turn, this implies demand for water was lower than supply

during this early period reinforcing the assertion costs of change outweighed potential benefits. Gains from mobility were further enhanced by squatters' claiming enormous tracts of land coupled with scattering of these claims to include geographically disparate areas.¹³ In Anderson and Hill's (1975) framework this shifted the marginal benefit curve of property right change to the left reducing investment in this activity.

Second, squatters' invested in construction of rudimentary dams to reduce drought costs. While these were illegal under the riparian doctrine, squatters' vast land holdings meant many of the smaller rivers where construction took place were within the boundaries of their properties, minimising the likelihood of legal challenges. In addition, the threat of legal challenges was limited because court action was prohibitively costly and uncertainty surrounding the application of riparian rights reduced the probability of winning.¹⁴ Uncertainty regarding riparian rights existed because squatters' did not own the land they occupied. Given acquisition of riparian rights was subject to ownership conditions, squatters' could not be sure claims under the doctrine would be recognised by Victorian courts. Nevertheless, even if riparian rights were upheld, the colonial government could, at any time, remove squatters from land without compensation thereby increasing costs associated with investment in defining property rights while reducing this group's ability to capture the benefits investment.¹⁵

Finally, squatters' invested in sinking wells to tap into artesian water supplies that would be used to supplement surface water during times of severe drought while avoiding riparian laws. During this period, artesian water was an open access resource and while the costs of finding potable water below the surface were high, once discovered, use was unrestricted. This made investment in accessing artesian supplies lower than costs of altering the riparian doctrine.

While squatter settlement dominated initial population expansion, by the start of the 1850s gold discoveries in Victoria (1851) altered the relative institutional equilibrium. By the time technologically available supplies of gold had been exhausted by small, capital poor miners in the early 1860s, massive population influx into the colony led to a shift in government land policy which attempted to create employment in agriculture for the now unemployed gold miners while removing squatters' land monopoly.

IV THE SELECTION ERA

Government attempts to provide employment opportunities for the gold mining population in an underdeveloped industrial economy relied primarily on creation of a large-scale agricultural sector. In part, this was driven by desires to recreate population density and social structure of the English countryside, referred to as the sturdy yeomanry.¹⁶ This period of land reform (1862 to

approximately 1882) is generally known as the selection era, where successive legislative enactments introduced free selection before survey. Selection permitted smaller settlers to claim up to 320 acres of land anywhere in the colony except land owned under freehold. By definition, this included land already occupied by squatters. Resenting this encroachment squatters wasted substantial resources exploiting various loopholes in legislation to maintain their landholdings. For example, squatters employed dummy selectors who would register claims in their own names then transfer land to squatters for a fee. While this was an unproductive activity diverting squatters' time and capital to non-productive evasion efforts, it did allow squatters to stave off large land losses during the following decades. For this reason, on the whole, contemporary analysts argue selection failed to attain government aims.¹⁷ However, it did increase the number of settlers in the more arid districts and thereby, employment in the agricultural sector (refer to table 1, below).

Table 1: Victorian population by location 1861-1901

	Capital City (Melbourne)	Other urban^a	Rural	Employment in Rural Industries^b
1861	123,061	112,249	303,357	50,301
1871	191,449	182,701	357,378	82,327
1881	262,389	173,054	426,903	119,527
1891	474,400	140,956	515,067	100,479
1901	484,103	163,294	552,207	126,840

^a Other urban is representative of rural centres such as Ballarat, Bendigo, and Geelong (Source: Vamplew, W., (1987), *Australian Historical Statistics*, p. 41)

^b Figures include casual and permanent employees (excluding Aboriginals) as well as proprietors and their families (Source: Vamplew, W., (1987), *Australian Historical Statistics*, p. 72)

In turn, selection also altered nature of settlement signalling a shift away from land extensive grazing to land intensive crop farming thereby removing the inherent characteristics previously allowing relatively efficient efforts by squatters to reduce costs of drought while avoiding high costs associated with altering the riparian doctrine. As a result, high costs of drought now came to be borne by a significantly larger number of voters in more arid districts threatening to sway future election outcomes for their parliamentary representatives. Given these effects, it is not surprising the issue of water supply provision quickly became politicised during the 1870s.

Demands for government action resulted because costs of using government to effect a transition in property rights decreased relative to the cost of private investment in definition and enforcement.

Private costs increased for three reasons; first, capital poor selectors were unable to fund investment to provide water supply security. Second, higher population density added to intensity of river use thereby increasing relative scarcity. Third, there was increased potential for legal action under the riparian doctrine. In addition, potential cooperative arrangements for infrastructure construction also became more costly because they required negotiation with larger numbers of individuals adding to contracting and enforcement costs. In turn, according to Anderson and Hill's (1975) framework, the marginal cost function shifted left. And, when the drought of 1877-1878 dried up many inland rivers and lakes creating a major crisis for these settlers, government could no longer ignore demands for action as "thousands of small farmers and their families were in dire distress, with only their votes to lift them out of their misery."¹⁸

While rural parliamentary representatives could not fail to be aware of the potential losses they would incur if not re-elected, lack of water supply security had much wider ramifications for government economic development plans.¹⁹ Economic development policy was based on establishment of a viable agricultural sector to create employment. This could only be achieved via maintenance of high rural population density. Therefore, if parliament failed to provide domestic water supply security, this policy would fail. As a result, in 1878, the government commissioned an investigation into provision of rural domestic water supply by a newly created body, Water Conservancy Board (WCB).²⁰ The WCB's early investigations focused on planning, finance, and administration of domestic supply schemes in rural centres, such as Swan Hill and Kerang. These investigations formed the basis for legislative action in the form of the Water Distribution and Conservancy Act (1881) providing treasury finance for domestic schemes to be paid back via application of property taxes. Financial management and administration was vested in newly created local bodies, waterworks trusts, organised along similar lines as local councils. While this legislation did not abolish riparian rights, to prevent riparian legal challenges, it gave trusts power over surface water supply within their jurisdiction both to divert water itself and grant licenses enabling others to divert.²¹ Given the high costs of private action, as noted, this new institutional arrangement was efficient in that it improved access to water supplies for those without riparian rights, limiting economic costs associated with drought. In addition, it ensured the maintenance of relatively high rural population density to support employment and investment in agricultural development.

Paralleling state action, a number of settlers attempted to augment water supplies via individual and collective experiments in irrigation despite relatively high costs.²² While newspaper evidence notes only four cooperatives during the early to mid-1880s, these details indicate potential for institutional evolution in water rights from the bottom-up like that which occurred during a similar period in many western states of the US with the

introduction of prior appropriation.²³ However, this possibility was quickly eroded as successive legislative action attempted to exert further control over water supplies within the colony by expanding the trust system thereby slowly eroding, but not entirely removing, the application of riparian rights. Extension of the trust system came in 1883 with amendment to the Water Conservation and Distribution Act (1881) allowing irrigation trusts to be formed along similar lines to waterworks trusts. While potential benefits of forming irrigation trusts included increased water supply security, improved land values, and increases in current and future income due to higher output no trusts were formed under this legislation due to the existence of prohibitively high transaction costs.

Transactions costs were prohibitively high for three main reasons: minimum numbers required for trust formation; details required in formation petition; and lack of finance.²⁴ First, this act permitted formation of a trust only if three-quarters of the landowners, owning two-thirds of the land in the proposed district agreed. This increased the likelihood of expensive, protracted negotiations with large numbers of owners as well as potential for hold-up. Private cooperative schemes could avoid these costly negotiations by restricting scheme size and therefore, the number of landowners involved.

Second, petitions to form trusts required immense amounts of information on proposed schemes. Information required by parliament included: amount of land irrigable and its estimated value; water quantities to be used; value of already constructed water works in the region; engineering plans and a description of works to be constructed; and estimated cost.²⁵ This required substantial investment by petitioners prior to parliamentary approval, increasing costs of government sanctioned schemes. Once approved, changes in design, construction, or layout that may be needed due to unanticipated variations in local conditions had to be submitted for parliamentary consideration removing flexibility inherent in smaller scale local cooperative endeavours. In addition, the lag time between lodging petitions and approval was considerable. Evidence suggests the few groups that applied for formation of irrigation trusts under the 1883 act waited anywhere from 12 to 18 months for approval.²⁶ Finally, transaction costs were high because even if approved, financing could only be obtained on the under-developed capital market settlers knew little about. Therefore, it is not surprising to find private cooperation was preferred. High costs meant efficiency gains created by removing potential for riparian challenges and associated hold-up under this legislation were eroded. In turn, both individual and collective private efforts continued to dominate irrigation in the colony.

While local councils and waterworks trusts provided some support to irrigation cooperatives and individuals for instance, infrastructure to prevent their interference with public roads and water

diversion licences to access supply, parliamentarians encouraged private individual experimentation but actively discouraged cooperatives.²⁷ Discouragement was primarily based on assertions that private infrastructure construction and water diversions on unregulated rivers were illegal under the riparian doctrine. Therefore, cooperatives risked losing their investment if private citizens either destroyed their works or asserted their riparian rights via legal action.²⁸ In this way, the government acted to destroy private solutions to property rights inefficiencies thereby increasing demand for its own services.²⁹ Government efforts to prevent cooperatives and bring irrigation under state control were primarily a response to scarcity of water supply as well as the fundamental belief that, as discussed, creation of a viable agricultural sector was the only way to ensure successful economic development. In this way, if government had ceded control of water to private interests, development aims would be impossible. As a result, key parliamentarians' argued control of water should be responsibility of government. Alfred Deakin, key architect of the 1886 Irrigation Act, reflected this attitude in a parliamentary report investigating irrigation in the western US, arguing:

The one lesson to be learned [is]....though water [in Victoria] may not be the vital necessity it is in most of the irrigated districts of America, it is at least the means by which land can be greatly increased in value, in production, and in its capacity of sustaining population, and is, therefore, a treasure which no State can afford to give carelessly away.³⁰

And, while the 1886 Irrigation Act attempted to lower costs associated with irrigation trust formation thereby increasing efficiency gains associated with state sponsored irrigation, it also included a section (four) vesting ownership of all surface water resources in Victoria in the Crown.

V IRRIGATION ACT (1886)

While during the early 1880s irrigation was driven by private sector initiative, these years were also characterised by more overt lobbying for public sector intervention to provide funds for large-scale irrigation schemes. From approximately 1883 onward lobbying efforts aimed at concentrating public interest on the need for irrigation resulted in creation of large numbers of farmers clubs and irrigation leagues organised both within and across electoral boundaries. These bodies held numerous meetings with local parliamentary members and continuously petitioned parliament for creation of a 'national' scheme. Increased investment in lobbying rather than private irrigation schemes resulted from three factors.

First, provision of treasury funds for domestic schemes signalled willingness on the part of government to support extensive rural investment typically beyond the capital means of the average settler. Second, costs of private irrigation far outweighed costs of lobbying. While there

were numerous reports of successful irrigation experimentation, information on costs is sketchy. Given most irrigation undertaken during this period was experimental, methods used by settlers varied and costs fluctuated significantly. For instance, Mr. Crystal at Torrumbarry was estimated to have spent £1,000 to irrigate 1,000 acres while estimates for the Officer Brothers scheme at Murray Downs were between £200 and £300, including construction of two small dams and 13 miles of channel to irrigate 12,000 acres.³¹ Additional reports of costs in the *Kerang Times and Swan Hill Observer* are similarly unclear.³² Reports regarding formation and organisation of the small number of cooperatives also provided little information regarding costs or individual contribution. For instance, it was estimated the Leaghur and Meering Irrigation Company spent £400 to £500 to construct a five mile channel while the Marquis Hill Irrigation Company spent £200 on construction of a three mile channel.³³ Nevertheless, these estimates were far above the costs associated with Irrigation League or Farmers Club membership at approximately 2 shillings, 6 pence therefore providing a greater incentive for individuals to become members of leagues rather than invest large sums in irrigation experiments the benefits of which were uncertain.³⁴ Finally, the number of irrigation leagues and farmers clubs increased between 1883 and 1886 because both were election years. In this way, to ensure they retained their seats, local parliamentary members were likely to be more receptive to lobbyists' demands.

By the end of 1885 there were approximately 15 leagues and clubs in the colony, with details of meetings and resolutions recorded in local newspapers. A number of these meetings were attended by local members of parliament intent on ensuring legislative action to guarantee them of retaining their seats at the 1886 general election. At the state level, lobbyists assured government that if it failed to invest in irrigation, settlers would be forced to abandon their holdings and squatters would reclaim monopoly ownership.³⁵ Settlers' abandonment of their claims would lead to significant economic losses for the state because it would have removed the possibility for creation of permanent, intensive agriculture and therefore, long-run economic development. However, lobbying for irrigation did not lead to capture as the majority of Victoria's population remained concentrated in rural areas during the period (refer to table 1, above). Therefore, the interest-group theory of transition does not apply here. Instead, as theory suggests, lobbying resulted from high transaction costs associated with investment in definition and enforcement of private rights. And, while from 1886 Victoria experienced relatively high rainfalls, threat of future droughts created an on-going perception another water shortage crisis was inevitable. Combined, these two factors explain why an institutional transition from riparian rights to government control took place at this juncture in Victoria's history, culminating in the Irrigation Act (1886).

In response to increased lobbying, the government appointed a Royal Commission to investigate methods of irrigation organisation and finance within Victoria, chaired by the key parliamentary

advocate of large-scale schemes, Alfred Deakin.³⁶ In turn, the issues before this Royal Commission were not whether irrigation would be supported by the state, but what type of institutional arrangement would be successful in promoting establishment of a viable agricultural sector. Therefore, its main enquiries focused on organisation and finance of irrigation in countries with similar climates. While these investigations included examination of irrigation organisation in India and Egypt, it was believed the irrigation experience in California and Colorado, where the most appropriate comparisons.³⁷ To better understand the nature of irrigation undertaken in the US Deakin toured the western states in 1884 recording his findings in the First Report of the Royal Commission.³⁸ It was this report that led to two key institutional changes relating to water allocation in Victoria encapsulated in the 1886 act.

First, Deakin observed the “injurious results of uncertainty” of the legal rights of riparians and irrigators in California resulting in a “web of litigation” that had crippled irrigation and threatened £40,000,000 of investment in irrigation lands and works.³⁹ Given the crucial role large-scale irrigation was to play in ensuring economic development in Victoria, Deakin argued high costs of legal uncertainty must be avoided via legislative action, noting:

The settlement of this difficulty [between the rights of riparians and the rights of irrigators], whatever it may be, must be such as to lead to an extension of irrigation by providing for utilization of all the waters of the State under conditions that will protect alike the public interest and the private appropriator. The crippled condition of irrigation enterprise still remains an impressive warning in a new State before vested interests become too deeply involved. In every country in which the practice of irrigation is grafted upon agriculture for the first time, the same difficulties must be met or avoided...Government [in the western United States] has done nothing to secure the appropriator of water the fruit of his labours, or enable him to take a position in the Courts. In fact, legislative interference is only desired by the people of the States to untie the knots which the Legislature has either tied or neglected to untie.⁴⁰

This recommendation was formalised in section five of the Irrigation Act (1886) which abolished further acquisition of riparian rights in Victoria.⁴¹ To ensure effectiveness of this section, and based on Colorado law Deakin believed to be “by far the most successful” an additional section (four) was inserted into the act claiming ownership rights in all water within the colony for the Crown.⁴² Together, these sections completed the transition in water property rights started five years before from private usufructuary rights to public ownership. And, as mentioned, this transition was efficient because it not only overcame high costs of private action to effect a change in water rights but also alleviated the drought crisis.

In the years immediately following the Irrigation Act (1886), 25 irrigation trusts were constituted. However, growth of the irrigation sector failed to attain the expected outcomes. Numerous problems plagued the trust system including delays in infrastructure construction, low skilled farmers, and limited access to markets to sell what little output was produced. In turn, these factors created significant financial problems as farmers refused to pay for water either because they did not use it or supply failed. Given loan repayment calculations were based on all land within a trust claimed to be irrigable in formation petitions actually being irrigated, it is no surprise that trusts' failure to irrigate resulted in their inability to pay even the four percent interest levied on loans provided. As a result, by the mid-1890s, in the midst of drought and economic depression, total indebtedness of trusts was £1,157,460 with only 120,677 acres out of an aggregate trust area of 2,373,180 acres being irrigated and the trust system was declared a failure.⁴³ In response to this, yet another institutional transition took place away from decentralisation to centralised, government control under a newly created state department, the State Rivers and Water Supply Commission that came to dominate water allocation and pricing in Victoria for the next 80 years.

VI CONCLUSION

This paper used current institutional economics theoretical literature to analyse the factors leading to the transition in water rights from common law riparian rights to quasi-government control in Victoria, Australia between 1840 and 1886. It illustrated that initial settlers did not invest resources in altering the common law of riparian rights because negotiation and enforcement costs were high while precarious land tenure meant benefits of such a shift could not be fully captured by the group investing in such a change. However, variations in land settlement policy after the 1850s highlighted inefficiencies of the riparian doctrine as an increase in population and changed farming methods added to relative water scarcity and costs of private investment in institutional change. In turn, prohibitively high transaction costs of private action to effect institutional change led to increasing demands for less costly government action. In addition, the alteration in land policy magnified the impact of drought leading to significant crises for rural settlers. This reinforced demands for government action provided via legislative action in 1881 (Water Distribution and Conservancy Act). Paralleling this, private collective action in irrigation increased illustrating the possibility for institutional change from the bottom-up. However, this potential evolutionary path was prevented by government because its economic development plans relied fundamentally on maintenance of public control over water resources. Therefore, against the backdrop of extensive lobbying by rural interests, government encouraged irrigation, but only within an institutional framework in which they retained all property to water in the colony. This was attained via the passing of the Irrigation Act (1886) preventing further acquisition of riparian rights in the colony while declaring all surface water exclusive property of the Crown.

In light of these events it has been argued the institutional transition that took place during this period in Victoria's history was efficient because it overcame transaction costs associated with large-scale private irrigation while alleviating the drought crisis. And while further institutional change to at the start of the twentieth century eroded these initial efficiency gains by maintaining public ownership when full private ownership would have resulted in increasing economic benefits, the factors leading to these inefficiencies will be the subject of further research.

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¹ For instance, Powell, J. M., (1989), *Watering the Garden State*; Davis, P. N., (1971), *Australian Irrigation Law and Administration*; Clark, S. D., (1971), 'The River Murray Question: Part I – Colonial Days', *Melbourne University Law Review*, Volume 8, June; Clark, S. D. and Renard, I. A., (1972), *Law of Allocation of Water for Private Use: Framework of Australian Water Legislation and Private Rights*, Vol. One; Freebairn, J. (2003), 'Principles for the Allocation of Scarce Water', *The Australian Economic Review*, 36(2), pp. 203-212

² Anderson, T. L. and Hill P.J., (1975), 'The Evolution of Property Rights: a story of the American West', *Journal of Law and Economics*, 18 (1), April, pp. 163-79; Libecap, G. D., (1989), *Contracting for Property Rights*, Clay, K. B., (1999), 'Property Rights and Institutions: Congress and the California Land Act 1851', *Journal of Economic History*, 59 (1), pp. 122 -42; Banner, S., (2002), 'Transition between property regimes', *Journal of Legal Studies*, 31, June pp. S359-S371; Levmore, S., (2002), 'Two stories about the evolution of property rights', *Journal of Legal Studies*, 31 June, S421-S451; Anderson, T. L. and McChesney, F. S., (eds.), (2003), *Property Rights*.

³ McChesney, op.cit., p. 235.

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⁸ Higgs, R., (1987), *Crisis and Leviathan*; Hazlett, T. W., (1990), 'Rationality of US regulation of the broadcast spectrum', *Journal of Law and Economics*, 33 (1), pp 133-175

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¹⁰ These settlers were referred to as squatters because, prior to the passing of the Squatting Act (1836) their land claims were illegal under colonial law which prevented a movement of settlers beyond the boundaries of initial settlement, referred to as the Nineteen Counties.

¹¹ Harris, E., 'Dams and Disputes: water institutions in colonial New South Wales, Australia, 1850-1870', Unpublished Manuscript.

¹² Anderson, T. L. and Hill, P. J., *op.cit.*

¹³ For instance, in 1848-49 the average size of claims was approximately 24,000 acres (Harris, E. in Bennet (ed.), (2005), *The Evolution of Markets for Water*, p. 44).

¹⁴ Brodribb, W.A., (1883), *Recollections of an Australian Squatter*

¹⁵ The government did in fact do this during the 1860s via the introduction of a policy referred to as selection.

¹⁶ White, C., (1992), *Mastering Risk*, p. 132

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- ¹⁷ For example, Fitzpatrick, B., (1969), *The British Empire in Australia*; Powell, J. M., (1970), *The Public Lands of Australia Felix*; Dingle, T., (1984), *Victorians Settling*
- ¹⁸ Powell, J. M., (1989), *Watering the Garden State*, p. 98
- ¹⁹ Members of the Victorian parliament were not paid for their services until the 1880s however; the losses here are the power and privilege associated with holding office. General elections were held in Victoria in 1871, 1874, 1877, 1880, 1883, and 1886.
- ²⁰ The WCB had two members: Alexander Black, Assistant Surveyor-General and George Gordon, Chief Advisory Engineer of Water Supply to the Board of Land and Works.
- ²¹ Davis, P. N., (1971), *op.cit.*, volume 1, p. 334
- ²² By March 1, 1884, 158 out of 7,830 farms in the colony were experimenting with irrigation (Anon, (1885), 'Results of Irrigation', *Kerang Times and Swan Hill Observer*, April 21
- ²³ Reporter, (1883), 'Irrigation at Meering', *Kerang Times and Swan Hill Gazette*, July 13; Anon, (1885), 'Marcorna Irrigation Company', *Times and Swan Hill Gazette*, May 8; Anon, (1885), 'Marquis Hill Irrigation Company', *Times and Swan Hill Gazette*, August 25
- ²⁴ Harris, E in Bennet, (ed.), *op.cit.*, p.47
- ²⁵ *Ibid.*
- ²⁶ Anon, 'Editorial', (1885), *Kerang Times and Swan Hill Observer*, June 23
- ²⁷ Anon, 'Editorial', (1884), 'Irrigation Trusts', *Kerang Times and Swan Hill Observer*, February 1; Anon, (1884), 'Important to Northern Selectors', *Kerang Times and Swan Hill Observer*, May 2
- ²⁸ *Ibid.*
- ²⁹ McChesney, F. S. in Anderson, T. L. and McChesney, F. S. (eds.), 2003: 228
- ³⁰ Deakin, A., et.al., (1885), 'First Report of the Royal Commission on Water Supply: Irrigation in Western America so far as it has relation to the circumstances of Victoria', *Victorian Parliamentary Papers*, Volume 2, Paper Number 19, p. 62
- ³¹ Agricultural Reporter, (1882), 'Irrigation on the Murray', *The Australasian*, 33 (869), November 25, p.697; Agricultural Reporter, (1882), 'Irrigation on Barr Creek', *The Australasian*, 33 (865), November 12, p. 665; Brunt, (1882), 'Irrigation on the Murray', *The Australasian*, 33 (872), December 23, p. 825
- ³² Anon, (1885), 'Benefits of Irrigation', *Kerang Times and Swan Hill Observer*, January 23; Special Reporter, 'Irrigation', *Kerang Times and Swan Hill Observer*, August 1
- ³³ Anon, (1883), 'Swan Hill Shire Council', *Kerang Times and Swan Hill Observer*, April 6; Anon, (1885), 'The Marquis Hill Irrigation Company', *Kerang Times and Swan Hill Observer*, August 25
- ³⁴ Anon, (1884), 'Murrabit', *Kerang Times and Swan Hill Observer*, November 11; Anon, (1885), 'Wandella Farmers' Club', *Kerang Times and Swan Hill Observer*, May 5
- ³⁵ Anon, (1883), 'Petition to Parliament', *Kerang Times and Swan Hill Observer*, June 19; Anon, (1885), 'Irrigation Convention', *Kerang Times and Swan Hill Observer*, April 17; Northern Selector, (1883), 'Letter to the Editor', *The Australasian*, July 14
- ³⁶ Deakin was Victoria's first Minister for Water Supply and in 1903 became Australia's second Prime Minister.
- ³⁷ This resulted from Deakin's belief that, "the close resemblance of the peoples, their social and political conditions, and their natural surroundings, renders the parallel between Southern Australian and the Western States of America as complete as such parallels can well be" (Deakin, A., et.al., (1885), *op.cit.*, p.9)

³⁸ *Ibid.*

³⁹ *Ibid.* p.16

⁴⁰ *Ibid.*, p. 16/17

⁴¹ Regardless of this section, in the following year, the Victorian County Court upheld a riparian claim for an injunction to prevent water flow interference by an individual pumping water for irrigation upstream even though the water was artificially conveyed to the stream via waterworks trust infrastructure. The Court noted that waterworks trusts could only have “special property” in water so long as they retained it within their works (*Newstead v. Flannery*, (1887), *The Australian Law Times*, 8 (183), May 14, p.173).

⁴² Deakin, A., et.al., (1885), *op.cit.*

⁴³ Anderson, A., et.al. (1896), ‘Report of the Royal Commission on Water Supply’, *Victorian Parliamentary Papers*, Volume 2, Paper Number 80