Maximising Local Business Opportunities from Major Water Infrastructure Works: The Australian Paradise Dam Project

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Abstract

Purpose – This research investigates the impacts of major water infrastructure projects on local business opportunities through its focus on the Paradise Dam project in Queensland, Australia which was completed in 2005.

Design/methodology/approach – Approximately forty key informants (drawn from the public and private sector, from industry groups, construction authorities, head contractors and local businesses) were interviewed, and asked to respond to a series of structured and unstructured questions. The purpose of the interviews was to glean information on how business opportunities had been created and optimised through the Paradise Dam project, across the term of the whole project from pre-construction to final completion.

Implications – Semi-structured interviews with key informants revealed the need for an improved system of information dissemination and training; and for a recognised single point-of-contact senior manager who could provide a consistent, quality source of information, both strategically and operationally about the project. It was also found that local participation could be improved by setting more realistic timeframes at the start of the project; and emphasising the importance of both the qualification and self-qualification of potential local contractors to individual packages.

Key words: Water infrastructure, Dams, Business Opportunities, Employment

JEL Classifications: D60; L53; L95; R11
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Introduction

In manufacturing, the quality of a product may be regularly inspected and evaluated enabling management to take action when quality falls below minimum standards (Davidson & Manning 2003). In service industries this is not the case as individual employees represent the interface between organization and customer and, therefore, have ultimate responsibility for the quality of service delivered (Christou & Eaton 2000). One suggestion to ensure appropriate social interaction between employee and customer is to consider the personality of employees in staff selection (Teng 2008). A second suggestion, training, has also been proposed (Christou & Eaton 2000). But, at least as early as the 1950’s a third influence, the workplace psycho-social environment, has been shown to affect employee behavior above and beyond that explained by personality and training (Fleishman 1953).

Major, publically funded water infrastructure projects have the potential for sustainable, economic and other benefits to the businesses in the regions in which they occur. What is much less clear however, is how those benefits can be maximised for local businesses. These may occur in both the short term and longer term, and involve structural and development opportunities for participating firms and for that local sector. The securing of such opportunities may have also involved potential issues and challenges that need to be identified, understood and managed. This work seeks to investigate this range of issues (which, quite surprisingly, appear to have attracted quite limited analytical investigations in the past – both in Australia and overseas); by focussing on the Australian Paradise Dam project completed in 2005.

Larger water infrastructure projects will normally emerge over an extended period. It may take five years or more for such projects to be identified, assessed, planned and financed and for all necessary approvals to be secured. The project will then need to be designed, constructed, delivered and commissioned. Because of the scale and complexity delivery will also often extend over a long period of time.

The undertaking of such projects may depend on such factors as economic opportunities, agricultural and industrial development strategies, climatic and environmental conditions and population growth and concentrations. Some of the components and packages in these projects, by the nature of the work, will almost certainly be sourced or provided locally. Other capital items, equipment and components will necessarily be provided from outside the region, sometimes from international sources, simply because such components are not manufactured locally.

Accordingly, the overall purpose of this study is to identify some common threads or themes that have proven significant for local firms in securing maximum business opportunities from water infrastructure projects. This will be achieved by collecting information through interviews with government agencies, contractors and sub-contractors who worked on the recently completed Australian Paradise Dam project. The paper starts with a literature review including a discussion of the costs and benefits associated with major water infrastructure works. This is followed by the primary research undertaken, findings, conclusion and recommendations.

Literature Review

Significant research work exists on the value or otherwise of dam and other water infrastructure projects. There is overwhelming evidence that regional towns and regions do benefit from employment generated from initial infrastructure development or as an effect of that development (Kenyon 1997). Once completed, the maintenance of a structure can be contracted to private enterprises, creating further overall employment opportunities. Multiple effects are realised after (1) new workers have settled in the region post
construction thus boosting regional population numbers; (2) additional capital has been injected into the region from compensation packages; and (3) established businesses have increased capabilities to accommodate contract opportunities. Additionally, Kenyon notes that infrastructure such as dams, often have a recreational component that provide future employment prospects, and increase tourism influxes to the region. Other infrastructure changes such as new road construction may also eventuate to support the main project.

Case studies are generally consistent in observing that new jobs are created both for skilled and unskilled workers during the construction phase of infrastructure (Infrastructure: delivering the goods, 2005). Some governments in the developed world undertake construction of dams and other infrastructure projects as part of macro level unemployment and economic development strategies. The extent to which a dam impacts on local jobs depends on the regional surroundings, both in physical and socio-economic terms (Aleseyed et al 1998). The closer the dam to a large city, the more likely it would be to generate wider, sustainable economic growth and development. Aleseyed et al (1998) also noted that the size and diversity of the existing manufacturing sector and the existing business investment and linkages influence the extent of the economic impact and employment in a region.

Watermeyer (2000) argues that any type of expenditure within a nation’s economy ‘create[s] employment opportunities’; particularly in the case of the building construction sector where positive capital flow generates employment for skilled semi-skilled and unskilled workers. Consequently, governments typically target this sector when job creation is required in an economy. Although no suggestion exists that these jobs are always sustainable, the opportunity to utilise the skills learned or enhanced is available during construction and post construction. Watermeyer (2000) also found that contractors who participated in construction development, place a ‘significant portion of the expenditure in the hands of the local communities’, and that initiatives aimed at small scale enterprises facilitate employment creation.

Dams provide hydropower, water supplies, irrigation, and flood protection - all necessary ingredients for development (Water Encyclopaedia 2010). The stock of dams, and their reservoir volume per capita, has been closely linked to a country’s stage of socio-economic development, as they provide considerable local benefits for regional residents such as jobs and increased business and entrepreneurial opportunities in the local and regional business sector (Kennedy & Forman 2003). However, new water infrastructure projects also have the potential to create hardship and involve substantial tangible and intangible costs. They normally require land acquisition, resettlement and rehabilitation (Tetteh, Awuah & Frempong 2006). They can also create cultural heritage issues, and in some cases have caused long-term, detrimental environmental impact (WCD 2000). The impact has mostly been felt by local populations, while the benefits were more likely to be received at the regional or ‘macro’ level (Tetteh, Awuah & Frempong 2006).

Within the literature there is a general absence of objective and detailed ex-post analyses (physical, economic, social or environmental) on the economic impact of dam projects on the local economy and businesses (World Bank 1998; WCD, 2000). However, there appears to be widespread agreement that benefits depend on the main purpose for construction, they can be sustained post-construction, and they can be multiplicative to a local economy.

i. **Benefits depend on a purpose**

According to the World Commission on Dams (2000), many dams (approximately 48%) are constructed for irrigation and therefore contribute greatly to food production. Substantially smaller proportions (approximately 20%) generate electricity, while (approximately) 15% serve domestic and industrial water supply. The remaining portions of
Dams are for service flood control, recreation, inland navigation and fish farming. Nearly 30% of dams in the world are demonstrably multi-purpose (ICID 2000). Multi-purpose dams, and in particular, those with recreational reservoirs are becoming increasingly important for regional economic development (Altinbilek 2002), more specifically on the basis of sustainable economic development through employment prospects (Merz 2005; ICID 2000). Clearly, the opportunities to capitalise on tourist and recreational pursuits are higher in developed countries and also dependent on the quality of the surrounding physical environment and the proximity of population centres.

Social benefits can also be measured as these are often linked closely with economic achievements. These include anticipated economic benefits flowing through to individual well-being and the development of community and social capital in the immediate area. For example, having secure employment for a sustained period of time increases both economic and social benefits particularly for dams with recreational uses of their reservoir, resulting in significant growth rates in the retail sector of that locality (Rephann 1996). Nevertheless, it needs to be recognised that benefits from new uses such as tourism and recreational purposes, whilst potentially good for the region, must be proven to be profitable or sustainable over time and, almost certainly, will not flow directly back to those who have been dispossessed or disadvantaged because of the site acquisition and project construction.

**ii. Benefits can be sustained post-construction**

Benefits to local employment can be maximised if appropriate training is considered, not only for direct employees of the project but for the community at large. Learning groups, leadership, and educational skills, and development of community structures could further facilitate the opportunities for employment during and after construction of a project in a local area (Kilpatrick et al 2003).

Multi-purpose dams also provide, in some cases, the opportunity for initially displaced residents to continue to be connected with the site once construction is finished. Consultation is required with the locals, so that the opportunity to commence partnerships or to purchase facilities that are aligned with the recreational components of the development is realised. This provides further economic benefits from the dam resources and development (ICID 2000). There may also be ongoing demands for land management and the inundation and catchment areas could provide opportunities for dispossessed owners and others in the area to retain some connection and affinity with the land. However, certain benefits could come at a cost to other sectors if skilled labour shortages prevail, as dam construction could potentially absorb existing skilled labour and create a shortage of labour resulting in wage increases and delays in other construction projects (Brody 1999).

**iii. Benefits can be multiplicative to a local economy**

The nature and existing capacities of local industries and their linkages appear to be a key factor when evaluating the benefits on local jobs to an area from a dam project. A region with stronger inter-industry links would be likely to make greater use of supplier partnerships and have an opportunity for innovation leading to multiplicative and long-term growth from a project (Baldwin & Peters, 2001).

Kennedy and Forman (2003) assert that the government plays an important role in building community capacity and in facilitating innovation and connectivity. If a community is to maximise the benefits from government investment in a dam project on local jobs, then attention should be given to developing and maintaining effective links between government, industry organisations and that community (Kilpatrick et al 2003).
These studies concluded that to make the most of project outcomes, a community needs to enlarge and draw on its social capacity to build a community driven vision and a partnership approach among participants. Such benefits cannot therefore be considered as an inevitable consequence of invested public funds. Nevertheless, the positive impacts can be considerable and have wider implications provided that there is sufficient attention given to sound preplanning and innovative approaches.

It is strongly argued that public infrastructure construction enhances the private sector by way of creating opportunities for firms and groups to engage in the building process, causing a ripple effect to the wider local geographical community (Barro & Sala-i-Martin 1995, p.13). Empirical studies undertaken in the United States of America show that benefits of infrastructure are more widely spread than simply increased employment in the immediate region (Easterly & Rebelo 1993; Klaesi 1994) and that there was a ‘significant relationship between public infrastructure and private sector performance’ (Easterly & Rebelo 1993). Tilt, Braun and He (2008) and Fearnside (2001) reported extensively on case studies and best practice for social and environmental issues pertaining to large-scale dams. Both studies related to developing world examples but neither considered benefits that might accrue to local communities or economies resulting from dam construction. These observations appeared to be consistent with the literature on water infrastructure projects.

Bird (2005) recognised a particular gap in knowledge that exists in the analytical assessment of such projects. He noted in particular, comments made by the WCD which concluded that whilst there were obvious positive contributions made to dams in terms of economic benefits, these key positive contributions were often offset by perceived social and environmental impacts which (depending on the circumstances of a particular project), may be unacceptable to the wider community. Bird’s (2005) observations concerning the key benefits as poverty alleviation, flood mitigation and access to drinking water referred principally to Asian water infrastructure developments. Nevertheless, his observations and those of the WCD also have resonance in the Australian situation where other, more immediate and emotive issues can, rightly or wrongly, cloud a range of very important economic advantages that may evolve from those projects. Bird (2005) further identified that, because of the lack of empirical evidence, the spin-off effects and economic multipliers that could emerge from such projects could easily be under-rated.

The WCD report and the worldwide responses to it under the United Nations Environment Program – Dams and Development Project (2009) provided a further example of this lack of assessment of local industry impacts. One hundred and seventeen responses were received globally from a range of government and non-government authorities. These responses related to such areas of concern as knowledge bases, the role and performance of dams and water storages and environmental and social issues. There was, however, very little reference to economic stimulus benefits other than those directly attributable to the use of water contained and re-allocated emanating from the completed project.

Overall then, major water infrastructure projects such as dams have traditionally been considered both a benefit and cost to local economies (Morimoto & Hope 2003). Some argue that costs outweigh benefits (Ghista 2005), while others argue that economic benefits outweigh costs ‘including those of environmental and social values’ (Merz 2005). However, very few make more than passing reference, let alone detailed analysis, of the impacts, either positive or negative, on local businesses or regional business sectors flowing from construction and related works. The current study seeks to address this issue in relation to the construction of the Paradise Dam, through in depth interviews of the key stakeholders to gain some further insights as to how business opportunities for local business operators involved may have been maximised.
Primary Research Method

Background to the Paradise Dam Project

Paradise Dam is situated approximately 35kms north-west of Biggenden and 80kms south-west of Bundaberg, in the South Burnett region of Queensland. The total capacity of the dam is 300,000 megalitres. Currently the dam makes available 124,000 megalitres of medium priority water and 20,000 megalitres of high priority water. The dam reclaimed 45 km of the Lower Burnett River and encompassed Eidsvold Weir, Barlil Weir and raised the level of Walla and Jones Weirs (Burnett Water For All 2002).

State Government environmental approval for the dam was granted in October 2001 and Federal Government environmental approval was granted in January 2002. Development of the Paradise Dam was a controlled action under the Environment Protection and Biodiversity Conservation Act 1999, and was approved by Environment Australia, Canberra. The regional water authority, Burnett Water, formed the Burnett Dam Alliance in October 2003 to deliver the Paradise Dam Project. The consortium was made up of Walter Construction Group, McMahon Holdings, Hydro Tasmania, SMEC and the Wagner Group. Burnett Water was responsible for the approval, planning, design and construction stages prior to handover to SunWater in December 2005.

SunWater was then a Government Owned Corporation with shares held by the Natural Resources and Water Ministers on behalf of the State of Queensland. SunWater at that time managed water delivery, operation and maintenance of infrastructure and engineering consultancy services to 19 major dams, 63 weirs and barrages, 80 major pumping stations and over 2500 kilometres of pipelines and open channels.

Interview Process

As part of this research project approximately forty individuals were interviewed between 2008 and 2009, and asked to respond to a series of structured and unstructured questions. The interviewees were chosen from databases provided by Government Construction Authorities and Departments (such as the Department of Employment, Economic Development and Innovation), industry associations (such as the Industry Capability Network), and Chambers of Commerce to represent the major stakeholders of the Paradise Dam project. Thus, the interviewees could be best defined in a research sense as ‘key informants’; and were drawn from the public and private sector, from industry groups, construction authorities, head contractors and local businesses. All of those identified, including those having senior or executive responsibilities on the Paradise Dam project, were approached and all expressed an interest (and often enthusiasm) to be involved and were subsequently interviewed.

The purpose of the interviews was to glean information on how business opportunities had been created and optimised through the Paradise Dam project, across the term of the whole project from pre-construction to final completion. Each interview was for a period of approximately one hour but some extended to over two hours, and ample opportunity was provided to interviewees to contribute further comments and suggestions on practically all of the questions asked. Many interviewees took that opportunity and contributed valuable information pertaining to the Paradise Dam project. The data collected from the interviews was analysed through identification of common themes and recognition of individual viewpoints reflecting the experiences of the different types of respondents ranging from those directly associated with particular contract work (such as subcontractors) to those involved indirectly in the project (such as members of local community and council associations). Although no qualitative research methods software was used, the responses were carefully checked and corroborated between the two interviewers to determine any patterns or differences in the responses.
Findings

The key informants’ observations are grouped according to the interview questions which covered pre-construction issues, securing work and its continuity, administration issues, local contractor involvement, communicating information, the roles of local communities and councils, employment opportunities, head contractors and the issue of trust. These themes and questions were chosen as they closely mirror the stages of construction for a major water infrastructure project.

i. Pre-construction issues

Informants were of the view that although the Environmental Impact Statement (EIS) process was long and at times, challenging there was a general belief that public participation was properly integrated into the process, allowing stakeholders to present their point of view. As might have been expected, public announcements of the project drew interest from the media, particularly where some perceived negative impacts began to emerge. Minimising and attempting to address these negative impacts became complicated and politically charged with emotional language sometimes being used, particularly on environmental matters, both in the media and at public forums. Not surprisingly then, most key informants experienced some difficulties engaging in public meetings, gathering feedback, and conducting research while trying to respond in a credible manner to negative media coverage. Nevertheless it was critically important to identify matters which would impact on the project early in the phase. Such matters included indigenous and cultural heritage concerns, environmental impacts, workplace health and safety concerns and final water allocation and use.

When submissions were complete, the review process required conscientious responses to public concerns. Some key informants suggested that a ‘public diplomacy’ approach to such matters was perhaps the fairest, least disruptive and most expeditious way to proceed. This type of approach involved the constructing authority first assembling very thorough, and as detailed as possible, information and analysis on the particular project, its options and a preferred way forward, so ensuring that they would not be later compromised by matters raised which they had not previously considered. The compiled information could then be presented to the community and other interested stakeholders with a genuine interest to refine the proposal but not to radically change it.

Informants observed that it had to be accepted that any such major development work or change could almost never receive the endorsement of all, and the best way in which to deal with objections was to genuinely consider and, as necessary, modify proposals but not radically change their intent or prejudice the integrity of the overall decision making process. Once the final decision was made, immediate action was required to complete resumption procedures without delay, to minimise the uncertainty, anxiety and disruption to those who were directly affected and impacted. More importantly, informants observed that additional time should only be allowed in those early phases if the final completion date for the project was similarly extended. Otherwise this could seriously compromise the ability of local firms to later respond and prepare bids for work packages.

ii. Securing work and its continuity

An opportunity to engage in major infrastructural works is normally welcomed by private contractors but it also brings a number of other issues to be addressed. For example, local contractors were often not comfortable investing in capital resources for strategic positioning to secure future capital works without certainty of cash flow to support that investment in the long term. Furthermore, the introduction of quality assurance
qualifications and other certifications was perceived as limiting opportunities for non-qualified contractors to secure work in some instances. As many small and medium enterprises (SMEs) did not pursue these qualifications, they were immediately at a disadvantage in the process and precluded from tending. More positively, however, qualified enterprises were able to position themselves in a niche position when securing contracts for capital works. Thus, there appeared to be real advantages for progressive and proactive firms identifying and securing those certifications as general good business practice and the maintenance of their currency.

SMEs in particular needed to be proactive and possess strong management skills to be able to identify the opportunities and secure contracts. The adoption of a strategic approach and undertaking smaller contracting jobs in the initial phases could improve the chances for SMEs to gain an understanding of the internal workings of both the project and the construction authority/head contractor involved. This, in turn, could place them in a more advantageous position to secure contracts for project works. Personal contacts and networks were also perceived to be an important part of this process.

SMEs often felt intimidated when working with large bureaucratic private head contractors and government bodies which may have inhibited their ability to gain valuable work opportunities. Therefore it was critical for these local firms to understand how the tender process and contractual arrangements work. Active participation by managers/owners was central to success in obtaining the contract.

Alternatively, strong relationships between local council members and the project managers were seen as important in providing links with subcontractors. Council members usually provide early contacts for contractors when establishing a working base for large developments. This provided SMEs with the opportunity for a senior person within the local authority to act as a coordinator and mediator to promote both regional and individual firm’s capabilities.

iii. Administration issues

Once a contractor had been engaged to undertake work for the principal contractor, specific administrative duties were required to be performed. The completion of financial paperwork was seen as important as this supports the private enterprise cash flow during the project, facilitating payments to employees and suppliers in a timely manner. Subcontractors reported that completing paperwork correctly and in a timely manner to ensure payments was critical to a private contractor’s success, particularly since expenses such as additional wages and capital expenditure payments were liable to increase during the term of the contract.

Therefore it was important that payments were received in a timely manner to ensure that SMEs were able to support wage payments and other critical expenses. Large contractors also needed to understand and be sensitive to SMEs having access to funds to make payments on time. Having a personal contact in the administrative area also proved valuable when accounts were delayed, as managers could make immediate contact and have the situation rectified.

iv. Involving local contractors

Understandably, local suppliers and SMEs are not involved in the early planning and preliminary stages of a major infrastructure project – as planning, approval and financial agencies work to secure acceptance of that particular project. Often therefore, the contractors will have very limited knowledge regarding the upcoming project, except for the fairly superficial and sometimes sensational reporting within the media. Consequently, when a project was finally announced, it may have been perceived as somewhat
overwhelming. Even when local firms did respond, they frequently found that through those stages of the project, there were very limited, tangible actions that they could undertake in relation to submissions for upcoming works.

There was a repeated observation by local firms that their time was sometimes not well used in attending meetings that were generalised community gatherings but not business relevant. Some observed that having taken their time and effort away from their normal operation, they would become frustrated and, to some extent be reluctant to become involved. It was clear that one reliable point of contact manager who understood in detail the project and its timing and the type of information that firms may require, could provide a vital link in the infrastructure project.

To many of the SMEs it seemed that, after long periods where there had been little activity, they were asked to meet quite unrealistic deadlines in submitting contracts or specific expressions of interest for work. This caused difficulties as the potential contractors needed time to absorb the job specifications, decide if they had the competencies and capabilities to undertake a larger than normal project to complete the work, develop a competitive bid and then complete and lodge the necessary paperwork.

v. Communicating information

Communication of meaningful information enables trust to be built which provides the opportunity to engage with anticipated and future work contracts, and ensures that stakeholders have a more detailed understanding of the project. The majority of contractors interviewed, identified accurate, timely and meaningful communication as a critical element of the development. However, government agencies (as the sole architects of major infrastructure projects) sometimes have difficulty in communicating in a manner that is purposeful or constructive to the project and to the wide range stakeholders.

There was a perception that not enough information is provided in the initial stages of the project, and this may have inhibited some stakeholders or potential contractors participating in the planning phase. A Value Management exercise early in the project may however, provide such an opportunity. Once the official approval for the project to go-ahead was granted, prospective contractors tended to jostle to extract the pertinent information from the managing bodies. As this was not always easily assessable this often led to frustrations.

The key informants also observed that effective communication necessarily involved the development of networks of stakeholders. Developing networks was seen to be advantageous as smaller enterprises could showcase their competencies to the head contractor which could lead to further work opportunities. Potential stakeholders could also identify if there were additional opportunities for them during the project. Identifying the relevant capabilities required in specific areas at appropriate times, was complicated for the head contractor, who usually came into a region without local knowledge of which companies could undertake specific tasks. Therefore, it was important to establish communication networks between head contractors and potential contractors. This could be achieved by ensuring that the SMEs were located geographically close to the head contractors, and the early establishment of a regional subcontractors register and regional capability statement.

vi. The roles of local community and local councils

Stakeholder contribution throughout the life of the development was seen to be highly desirable. Persons or groups with a direct interest, involvement, or investment in the development, could identify potential bottlenecks, or opportunities to maximise project outcomes. Identified stakeholders of major infrastructure developments included federal,
state and local governments, suppliers, contractors, workers, educational bodies, community groups, citizens and environmental groups.

Community acceptance of the project was important in helping to achieve intended outcomes for the local community. During the construction of Paradise Dam in Queensland in 2005, an understanding of the additional increase in new industries and the opportunity for existing enterprises to secure additional work was recognised and embraced by the community. This helped to provide a positive working environment for the majority of stakeholders.

Strong links between the local Council and the head contractors and local firms also enhanced the project. A local council member or Mayor was often the first point of enquiry when the head contractors moved into the region and this facilitated the exchange of resources, including those required to build a work camp and accommodation. The local council adopted a strategic approach to infrastructure support, by ensuring that it was later reused for other purposes, and this again increased community support for the project. The relationship that developed at this stage with the contractors and council members also helped facilitate dealings with local enterprises, as the council members had local knowledge of business enterprises that had the ability to perform the work required.

Regions that were generally pro-development, embraced infrastructure projects and saw the viability of industry growth. However, at the end of the project, downturns were experienced when the focus shifted from labour intensive construction to less intensive maintenance operation surrounding the project, thus reducing employment levels. Preparation and (as necessary) contingency planning for this inevitability needed to be in place well in advance of the event.

vii. Employment opportunities

When large infrastructure developments moved into a region, sufficient levels of specialist skilled workers required for the project were typically unavailable in the immediate area. If the region did not have the requirement for these workers’ skills previously, it was unlikely an abundance of workers would exist when required. This sometimes meant that firms needed to train their current staff, bring in unskilled workers, or recruit workers from other regions.

Developing current staff skills was valuable as these skills could be retained and employed in the firms and region once the development was completed. However, during the course of the project, individual firms needed to keep control over their own personnel resources, to prevent poaching of skilled labour by other businesses. If key personnel left during the contract, the firm could be in a vulnerable position and may have to offer higher wages to keep the workers onsite, or alternatively seek new employees, which could be costly and time consuming. Contractors could minimise the loss of key personnel by using their own supervisors rather than utilising the head contractor’s workers so that they had much more control over the job outcomes as well as the workforce on site.

Recruitment and training of new workers who had limited opportunity to become accustomed to the organisations’ culture or values was critical to the success and completion of the development. Furthermore, after the development was completed, the skills developed by the enterprise and the workers during construction provided the opportunity to engage in work not normally or historically performed prior to the project. Anecdotally, it was recognised that flow-on economic benefits were realised if workers with improved skills settled in the region once the development had been completed. This meant that opportunities existed to enhance both people skills and industry growth, during and after the course of the project.
These flow-on effects from development projects benefited not only the immediate contractors, but also the workers who then had transferable skills that could be used in different geographical locations. Whereas geographical relocation posed difficulties in previous decades, contemporary workers had become more accepting of transfer to different regions for the duration of a project. When more opportunities for projects became available, workers were more open to accepting relocation as part of the package. This highlighted other issues such as increased relocation expenses, and providing comparable employment for partners of workers in the new region. In some instances workers were organised under ‘fly-in fly-out’ arrangements, as employers tried to provide an acceptable level of work/life balance for workers. Nevertheless, these arrangements meant that workers were often exposed to different timetables that impacted on their family, (e.g. working 11 days consecutively with 3 days off). For some workers, this was an unacceptable option.

The care and support of workers during long developments was initially important in ensuring that workers remained committed to the project. On site social integration is now more commonplace, providing the on-site workers with a safe and secure environment to interact on a personal level during down times. This is now mandated through Government legislation and workplace health and safety regulations that restrict the consumption of drugs, such as alcohol on site thus encouraging workers to engage in more physical and social activities. The proximity of work camps and accommodation close to a town centre both made the living environment much more attractive and also greatly increased consumption spending by workers within the town and its businesses.

viii. Head contractors and subcontractors

The principal or head contractor was usually responsible for the entire project and for coordinating the efforts of the subcontractors. The subcontractors were responsible for specific trades, which differed from project to project. Subcontractors usually had their own defined work team, responsible for completing identified tasks related directly to their core competencies. Using a limited number of subcontractors normally resulted in a better management environment and potentially lower costs and less disruption for the head contractor. However, a limited number of contractors could mean limited networks and ultimately additional specialist contractors may need to be sourced during the project, at times where resources are allocated elsewhere.

Principal contractors were typically engaged well before subcontractors or local firms. This meant that, while head contractors were focussed on the entire project, subcontractors were still trying to gain an understanding of what was needed, by when, and whether their firm had the capabilities to complete the work. Head contractors typically expected SMEs and other subcontractors to have all the necessary equipment on call from the initial tender. This proved to be difficult for some enterprises. Capital investment was required for some equipment as not all was available for hire on demand, particularly specialised plant. Moreover, not all enterprises would engage in capital expenditure just to secure a one-off large contract. Larger, more established firms had more opportunity to invest monies for this reason and therefore had an advantage over smaller enterprises. Some larger firms may have made strategic capital purchases, not necessarily for the intended infrastructure development, but for their own enterprises’ growth strategies.

The key informants emphasised the importance of two-way communication between principal contractors and subcontractors as this helped to identify potential problems and solutions as well as enhancing the working relationship. Additionally, it was thought that head contractors’ value statements needed to be communicated to SMEs and other contractors.
ix. Trust

The structure of the hierarchy of a large water infrastructure project is complex and diverse. Heavy reliance on sub-contractors and suppliers to complete the work presents significant challenges for principal contractors. It was considered that information that was both complex and sensitive needs to be monitored and disseminated and that trust was vital in these exchanges. Confidence was required between principal and local contractors, as fixed term contracts often existed which included strict recommendations indicating the types of action that should be taken in a particular circumstances, as well as a timeline for completion. Accordingly principal contractors needed to trust that contractors they engage had the capabilities to adhere to these requirements. These observations reinforce the basic observation that a fine-grained approach, often based on interpersonal skills and trust between individuals are essential in such projects, despite their overall large scale and apparent complexity.

Conclusion and Recommendations

This research has addressed the impact of major water infrastructure projects on local business opportunities, through its focus on the Paradise Dam project in the South Burnett region of Queensland, which was completed in 2005. As expected, it was found that during the period when construction and other activities were underway, there was substantially greater demand for a range of goods and services (supplemented by multiplier effects that were realised as the money secured was re-spent and invested across the region), and additional benefits to local firms through securing of significant work contracts. The findings from this research may be relevant to other water infrastructure projects in other regions within Australia, given the Federal guidelines for dam construction and reasonably uniform regulation of water infrastructure construction. However, these findings may not be generalisable to water infrastructure projects in other countries due to political, legal, economic and environmental differences.

Overall, the Paradise Dam project was recognised by practically all stakeholders as successful. The structured interviews with key informants undertaken as part of this research clearly showed that the current arrangements by which local industry sectors and firms become aware, and are informed, trained and coordinated to optimise their involvement in major infrastructure projects, can be confusing and may be inadequate. This may be attributable to the inherent inflexibility in politically determined timeframes as major projects emerge and evolve down to trade packages and particular contracts, and the limited strategic and operational knowledge of government and non-government agencies involved in attempting to link project opportunities with local business. Current, ad hoc arrangements in firms opportunistically seeking to secure one-off projects are time wasting and frustrating, and certainly do not maximise opportunities.

An improved system of information dissemination and training would almost certainly improve the prospects of those firms seeking sub-contracts and also assist them in self-qualifying/pre-qualifying themselves to seek only work that they have reasonable-to-good prospects of securing. Whether or not they finally make submissions in a particular case will depend on a range of other factors within that firm, including current workload, risk profile, and cash flow but their real ability to secure full and fair access to components of these major projects is a matter that relates to the entrepreneurship and preparation within those firms and is at least as important as the structures and policy initiatives of government.

The number of government agencies and not-for-profit organisations involved in these activities is not conducive to optimum outcomes. Rather, a recognised single point-of-contact manager who could provide a consistent, quality source of information, both strategically and operationally about the project would be invaluable. This point-of-contact
A manager would need to have professional expertise and credibility in this market, be able to ‘speak the language’ of all those involved in the supply chain, and understand the particular issues, reservations and limitations of the local suppliers. Knowledge of the local engineering / construction / services sector would also be an advantage, as would generic skills and experience in major projects, an intimate understanding of the project at hand and, hopefully, pre-established networks across firms and industry groups in that particular region. Importantly, the single point-of-contact manager must provide continuity in approach, and work on a continuous basis to put together opportunities beyond those that may be immediately obvious.

The position would need to be senior and have a recognised role and authority, unlike the current situation where many activities are done on a part-time or ad hoc basis and/or provided as a voluntary service. For consistency, too, that same person would need to work both with the construction authority and head contractor (to effectively unbundle and provide innovative approaches to trade packages) and, at the same time, work closely with informing and up-skilling local suppliers and industry sectors and clusters when submitting for projects. As much as possible, this single point-of-contact manager for the water infrastructure project should be provided from project or government funding.

This research has identified that two, not unrelated issues of timing and of pre-qualification are fundamentally important to the ability of local firms to fully participate in major infrastructure projects. A characteristic of such major water infrastructure projects is that timeframes are typically indefinite and flexible, often extending over a number of years. At the same time, however, political and demand imperatives are such that the prescribed date for practical completion is relatively fixed. Typically, a range of activities along the evolution of the project will take longer than originally anticipated, resulting in extreme time pressures for those project activities scheduled towards the end of the process. These late activities or components are those which are most likely to involve local subcontractors as the construction project is being finalised and delivered.

In the meantime, individual firms and local sectors may have been seeking to up-skill and secure improved knowledge of both upcoming opportunities and how they can participate in them. Confidence levels, however, given the unusual nature of the requirements, may not be high and their ‘pre-qualification’, either from their own assessment or with the assistance of some coordinating body, may not be fully resolved. When tight or unrealistic timeframes are imposed, the reaction from those firms may be to err on the side of caution and therefore to withdraw from what otherwise could have been good prospects.

It is unlikely that these issues could ever be fully resolved given the realities of political objectives and also the economic demands for the supply of the outputs of the infrastructure works at a set date. Nevertheless, the processes could be better accommodated by:

- Setting of more realistic timeframes at the start of the project (which, at that stage, may be difficult) or at least allowing for more flexibility and conditions on set timeframes which do not cause later political or other embarrassment;
- Making announcements (when timeframes are not being met) as to likely delays or, alternatively, making contingency plans so that the final tendering, construction and commissioning phases are not compromised. This will facilitate local participation and maximise opportunities for delivery of services to the project;
- Concurrent scheduling of activities in order to meet tight timeframes, as part of good project management, that avoids the strict sequencing of components; and
- Emphasising the importance of both the qualification and self-qualification of potential local contractors to individual packages.
In all physical infrastructure projects, a range of trades and activities will almost certainly be involved in site preparation, construction, provision of services and support to the operation. In each case, certain local businesses will potentially be involved – aligning with the trades and services identified above. The themes and observations that emerged strongly in this investigation may apply in other Australian water infrastructure projects; but may not be entirely generalisable to other jurisdictions due to environmental, legal, economic and political differences.

Reference List


Kilpatrick, S., Guenther, J. & Millar, P. (2003), Meander Dam: Social and Community Impacts, Department of Primary Industries, Water and Environment, Centre for Research and Learning in Regional Australia, Launceston.


