Social Research on the
Integrated Water Management project
Buntine-Marchagee Natural Diversity Recovery Catchment

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Cover image: One of the two gypsum lakes that are part of a primary saline braided wetland channel. This area is threatened by altered hydrology, including secondary salinity, and is an important biodiversity asset targeted by the Integrated Water Management project (photograph: courtesy of DEC)

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Acronyms used in this report

CFOC  The Australian Government’s Caring for Our Country program
BMNDRC  Buntine-Marchagee Natural Diversity Recovery Catchment
DEC  Department of Environment and Conservation
IWM  Integrated Water Management
NACC  Northern Agricultural Catchments Council
NAR  Northern Agricultural Region
NRM  Natural Resource Management

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1 Gavan Mullan has been involved with the Integrated Water Management (IWM) project for several years as Recovery Catchments Officer for the DEC managed Buntine-Marchagee Natural Diversity Recovery Catchment project. Consequently he has developed relationships and rapport with all participants and was active ‘behind the scenes’ in doing this research. Gavan’s role showed the importance of building trust and rapport with participants in doing qualitative social research (Goodrick and Bessarab 2011: 10; Goodrick 2011: 27-28).
Key findings

- Participating landholders in this social research were well aware of the aim of the IWM project: addressing the threat of altered hydrology by better management of surface and ground water. However, there appeared less understanding of the role of plant based management of water (with revegetation), than for engineering based options.
- Changes brought by the IWM project were mainly expressed in terms of better surface water management, less erosion issues and satisfaction with revegetation.
- The main reasons for landholder participation in the IWM project were to improve surface water management and redesign paddocks; and because the IWM works fitted with pre-existing plans.
- The Demonstration Water Management sub-catchment, or Demonstration site, was a significant driver in broad scale adoption of the IWM approach by landholders.
- Short time scales, farm work overlapping with IWM work, and issues surrounding fence construction were the most challenging for landholders participating in IWM.
- Landholders gained substantially in knowledge by participating in the IWM project and a variety of meanings were uncovered.

Figure 1: The Integrated Water Management (IWM) project is located within the DEC managed Buntine-Marchagee Natural Diversity Recovery Catchment, in Western Australia’s Northern Agricultural Region (photograph: courtesy of DEC).
The Integrated Water Management (IWM) project

The Department of Environment and Conservation (DEC) coordinates a Natural Diversity Recovery Catchment (NDRC) program which aims to protect regionally significant natural areas, particularly wetlands, threatened by salinity. The integrated Water Management (IWM) project was part of this program and is located in the Buntine-Marchagee NDRC (Figure 1). Since 2005, the IWM approach was implemented on several farming properties to address salinity and other changes in landscape hydrology. This approach focused on working with landholders and other stakeholders to protect biological assets as well as contributing to agricultural productivity. An important feature of IWM is that it combines engineering and plant based approaches.

The IWM approach gave DEC the opportunity to address multiple threatening processes at the same time. The aim was to reduce salt, nutrient and sediment export from sub-catchments to the downstream wetland assets (see cover image and Figure 4). Simultaneously, the work aimed to reduce water logging, erosion and salinity on agricultural land; and in several cases the works also helped to protect public roads. DEC staff worked with eight landholders, the Shire of Coorow, the Coorow Land Conservation District Committee and several other stakeholders between 2005 and 2011 to treat a target area of 19,000ha with the IWM approach (see also Figure 2). By August 2011, the overall IWM project was completed and included:

- 115 kilometres of grade banks
- 49 kilometres of waterway levies
- 104 kilometres of fencing
- five dams
- two public road floodway upgrades
- one major culvert on a sealed public road
- four kilometres of gully erosion repair
- removal of eight kilometres of obsolete earthworks; and
- establishment of 712,000 seedlings.

In the context of climate variability, IWM applies equally well, if not more, in the future. Climate variability predictions indicate that although average winter rainfall is expected to decrease — as it
has done for several decades already – high magnitude episodic events are expected to become more common and IWM will be important to help manage these events\(^2\).

\(^2\) I refer here to two DEC documents. One is a draft report compiled by G. Mullan (DEC 2012), the other a review of the Natural Diversity Recovery Catchment – compiled by K. Wallace (Wallace et. al. 2011).


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Figure 2: An information sign clarifying the type of works completed as part of the IWM project (photograph: Rolan Deutekom)
Methodology

This social research report is based on filmed interviews with six landholders and one DEC Officer. The aim of this research was to showcase the purpose, value and lessons learnt from the Integrated Water Management (IWM) project to investors and landholders. This report focuses specifically on changes in perceptions, attitudes and knowledge of participants. It gives insights into how participants perceived and experienced the IWM project.

Figure 3: L-R: Jan Muller (participating landholder), Ralf Mulks (filmmaker), Gavan Mullan (DEC) and Vern Muller (participating landholder) on Vern and Jan’s farm (photograph: Rolan Deutekom)

Ideally this report will be consumed together with the film, which is available on YouTube at https://www.youtube.com/watch?v=cjf9Cc4yvXs&list=PLAFD1065D9FA234B9&index=10&feature=plp_video and was prepared by filmmaker Ralf Mulks. The film gives an overview of the project and
completed on-ground works. This report adds to the film by looking systematically at the social\(^3\) side of the project.

This social research on IWM used a qualitative approach in the constructivistic tradition. Common features of qualitative research are that it focuses on meaning and understanding and mainly uses words instead of numbers (Goodrick 2011; Taylor-Powell & Renner 2003; Clarke 2005; Bernard 2000: 7-8, 20-21, 418-420). In this research six IWM participants were selected in a purposeful sample by Gavan Mullan (DEC) and interviewed in-depth by NACC’s Social Science Research Officer, Rolan Deutekom. All participants were living in the project area and interviewed on their farm properties. Figure 3, 6, 8 and 9 show how this worked in practice. The aim of the qualitative approach was to understand participant’s point of view and experience – their view of the world (Kvale 1996 in Goodrick and Bessarab 2011: 9).

Interviews were transcribed and analysed using template analysis and an open source coding program called WeftQDA was used for coding. From this process themes and insights emerged from the data which are recorded in the following sections.

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\(^{3}\) The term *social* can be ambiguous for many people, including social scientists. For some it mainly means the *aggregate* or *collective*; a group of people, for examples of this see Bernard (2000) or Fulcher & Scott (2003). For some it means *interaction* between people, groups and things (Latour 2005, Clarke 2005). For others it can be how individuals and groups *perceive* issues (Charon 2001). The term social can also become normative, e.g. “that’s a very social thing to do”, for an example of this in science see: Vanclay (2003) in which the author claims the goal of social impact analysis is: “... to bring about a more sustainable and equitable biophysical and human environment.”
Analysis

An integrated package

The IWM project was mainly designed to be a preventative measure, combining engineering (earthworks) and plant-based (revegetation/use of perennial plants) approaches. In the interviews all participating landholders mentioned the earthworks as well as the revegetation as being part of the IWM approach (see Figure 5a and 5b for an example of a grade bank). When asked what had happened on their properties landholders reported a variety of items had been implemented. These were:

- grade and levy banks constructed (mentioned 8 times)
- revegetation established (4)
- new paddock design (3)
- saltbush established (2)
- remnant vegetation fenced off (2)
- grassed waterways constructed (1)
- wildlife/bird corridor established (1)

From this list of responses it appears that earthworks were rated as more important to landholders than revegetation. Even though both aspects were mentioned as being part of IWM, most landholders did not mention revegetation as being a part of water management and only two landholders alluded to it. As one landholder put it:

The integrated component of the project as in, that it wasn’t just building [grade and levy] banks, I thought was a good idea. However both components are very crucial and I think linking them is important. I personally rate the banks [...] the number one component and the planting of the trees as a secondary component. Linking them is a good idea as I said but you must get the banks right to start off with.

Landholders did value the revegetation aspect of IWM, but more in an aesthetic sense. For example, several landholders mentioned the high success rate of tree establishment and beautification of their
land. All landholders mentioned that their properties looked more visually pleasing⁴. However, the effect of revegetation on water management, for instance in reducing water erosion, was mentioned by only two landholders. Also the effect on groundwater wasn’t mentioned by any landholders.

Most participants stressed the preventative nature of IWM, as one landholder noted:

*Well with the Integrated Water Management System it’s just helping to take the heavy or the one in 20 year rainfall event away in a more peaceful way, instead of it just rushing through your landscape and causing a bit of havoc.*

The opportunity to redesign paddocks was mentioned by three participants. Here one landholder explains what happened through IWM on his property:

*It has allowed smaller paddocks to be put into larger paddocks and enabled me to work my cropping methods on contours by using farming methods which everyone uses these days [which] includes the use of knife points. The water that falls from the sky stays where it is most of the time. So we’re getting more use out of the rain that falls because of the – well I’m assuming because of that [IWM] method of putting contours in and shifting water away into the water ways.*

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⁴ In DEC’s (2007: 12, 14) Buntine Marchagee Natural Diversity Recovery Catchment Recovery Plan: 2007-2027, several biodiversity values were identified. This research seems to align with the Intrinsic/spiritual/philosophical values (e.g. sense of place) as well as Amenity values identified by members of the BMNDRC steering committee.

**Figure 5a:** A ‘grade bank’ intercepts paddock surface water runoff, and delivers it to a safe disposal point – in this case, a constructed grassed waterway. Grade banks at the correct spacing and on a design ‘grade’ of 0.35 percent (7cm in 20m) prevent surface water flow gaining enough ‘flow energy’ to cause erosion. Note: the surface water runoff to the left of the foreground is from a removed fenceline – graded flat to level off the accumulated windblown soil. Re-design of paddock layouts to better consider natural boundaries was also part of the IWM actions (photograph: courtesy of Vern Muller)
Changes brought by IWM

Landholders reported several on-ground changes brought by participating in IWM. All but one landholder mentioned having better water management on their property. The one landholder that didn’t comment had not yet experienced enough surface water runoff to make an informed assessment of the value of the IWM works. Also, works had not started on this landholder’s property when a significant weather event occurred on 16 December 2007.5 Experiencing this weather event convinced participating landholders that the IWM approach worked. As one landholder put it:

_We had quite a solid rain event not long after, probably two months after some of the banks had been put in and it was 30 millimetre in quick time. We actually could go and watch the water work its way through the system and it worked fine, it was fantastic. The water was being shifted off Mamboobie road [...] and also off some other contours we had put in, going into a natural water way._

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5 I refer here to an internal document by DEC “Integrated Water Management Demonstration sub-catchment case study, 2009”. Landholders participating in IWM experienced rainfall intensities of 28mm per half hour (total rainfall of 56mm on 16 December 2007; and a range of 25 – 47mm on 15 December 2007). The 16 December 2007 event was calculated as a 1-in-45 year ‘average recurrence interval’ rainfall event.
A reduction in the amount of erosion was another on-ground change brought by IWM according to landholders. The IWM works, for example grade banks and grassed waterways, prevented (further) erosion and water logging. Most landholders reported a high level of satisfaction with the efficacy of these works. Landholders also reported that driving across their land was now easier as ruts and gullies were filled during the course of the IWM project. The revegetation component was mentioned by many landholders as a significant on ground change. The establishment of salt bush on several properties was seen as a substantial benefit as well. One landholder noted:

_We certainly see the benefit of the salt bush for the sheep to graze and the trees are doing remarkably well. There’s been an 80 - 90 percent success rate with all the plantings. And the remnant vegetation is recovering a bit and there’ve been good displays of everlasting especially in a year like this [2011]._

When asked about ‘before’ and ‘after’ changes landholders revealed similar responses. Again, water management was mentioned as being significantly improved. Landholders stated having less gully erosion, less water logging, less washouts and less water erosion. Additionally, one landholder mentioned better and earlier traffic-ability on his paddocks. However, two landholders talked about difficulty in accessing paddocks and moving their machinery around. As one landholder described it:

_Well the erosion is fixed up, whereas there was a problem before. The other on ground thing is it’s more difficult to operate my paddocks because of smaller pieces and - as farmers - we like large paddocks._

Revegetation was also mentioned again by most landholders as being an important on-ground change in the IWM project⁶:

_The tree planting has been quite impressive and those areas are starting to improve; they look better now. There was a bit of a scalded area and it’s now got trees on it and it looks very good. There’s certainly more kangaroos living in there which is a negative, but hopefully there’s more birds living in those areas where the trees are planted. So overall I see a lot of improvement there._

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⁶ This finding is in line with CALM and Colmar Brunton’s (2005: 44 and 78) Buntine Marchagee Catchment landholder survey 2003. In this survey aesthetic considerations and wildlife habitat were rated most highly by landholders in considering remnant vegetation in their farming system.
Reasons for taking up IWM

Every farm is unique in its circumstances. The same goes for landholders managing those farms (Vanclay 2004: 213-214). It is not surprising that in this research motivations for landholders to take part in the IWM project varied as well. For instance: one reason for two landholders participating in the IWM project was to increase the number of wildlife and bird species on their properties - through connecting large patches of remnant vegetation. For three others the IWM project fitted with plans they already had. For these landholders the IWM project was an opportunity to fulfil their plans earlier than anticipated. Below is a list of aggregated reasons why landholders participated in the IWM project:
- Improve water management issues (mentioned 5 times)
- Opportunity to redesign paddocks (3)
- IWM fitted with existing plans of landholders (3)
- Coordination work by DEC (3)
- Interest in wildlife and birds (2)
- Improve farm (2)
- There was financial assistance to design and implement works that fitted/overlapped with landholder goals (1)

Improving water management was mentioned most often as a reason for landholder participation in the IWM project. Several landholders reported having had heavy rain in the past, especially during summer. These events in turn caused large water flows, water erosion and water logging which caused erosion and damage to paddocks and roads. Slowing water flows and changing the way water flowed through the landscape was a big motivator for landholders to participate in IWM. Some landholders also saw IWM as an opportunity to redesign paddocks and make them align with natural features. As one landholder recalled:

*We were [...] thinking about it for years: to change our paddocks around and fix up some creek lines that were coming across the middle of paddocks and fences that were going in the middle of paddocks which should have been next to creek lines. So it just fitted in perfectly with plans that we had for the future.*

Three landholders stated explicitly that DEC played an important role in their decision to participate. DEC’s experience in projects elsewhere, coordination work and staff capability were praised by several landholders. This landholder stated:

*Well having DEC involved was paramount to the whole thing because I’m not going to do all the office work and book work, like apply for grants and stuff like that – that’s just beyond me. So it was good that DEC were there to do that and coordinate all the on ground works and the tree planters.*

Financial considerations were only explicitly mentioned by one landholder as a motive for participating in IWM. Improving their farm was mentioned by two landholders. The following landholder elaborates on this as well as other drivers:
I had plans [...] to pull a few fences out and realign a few paddocks and this [IWM] came along. It allowed me to do it because there was grant money involved and it allowed me to do it at no cost to myself and also it was going to help my farming methods. And so I was able to pull fences out, realign paddocks and shift water from A to B without causing any problems with my farming system.

Was this what landholders expected of the IWM project when they started? What were they thinking of getting out of the project? Again, all of the landholders were interested in improving their water management and that was their main expectation. One landholder mentioned salinity as an issue and was hoping that by participating in the IWM project this issue could be solved. Two landholders mentioned paddock redesign as an expectation of IWM and one noted protection of remnant vegetation. This landholder sums up his expectations clearly:

*The specific benefits we were hoping to get out of the [IWM] project was to fix up water erosion problems, gully’s that were forming, potential salinity in the low spots, directing the water in a better spot and to get a better paddock design [...]and reduce the number of paddocks. We had too many paddocks with fences going in the middle of open land that just shouldn’t be there - the fences would be better [erected] against natural features. That’s what we were hoping to get out of it.*

Did the type of landholders’ farming business influence their decisions to take part in IWM? For three landholders it did. One landholder with a mixed farming business mentioned the sheep on his property caused bare ground, which in turn exacerbated the amount of water erosion. Participating in IWM reduced this issue. A second landholder with a mixed enterprise was keen to keep his livestock out of the remnant vegetation, preventing it from further degrading, and was therefore keen to fence it off in the IWM project. A third landholder with only a cropping programme mentioned that it was easier to take fences out and redesign paddocks without sheep.

One landholder with a mixed enterprise was unsure if the type of farming business had influenced taking up IWM. This landholder indicated a desire to take part in IWM regardless of the type of business. Two landholders stated that their type of farming business did not influence their decision to participate. Of these, the first mentioned that he saw IWM as a good initiative regardless of what business landholders were in. The second landholder stated that DEC approached him and that his

7 There was an in-kind cost to all participating landholders: fence construction, revegetation site preparation, and planning. This landholder is referring to a ‘no up-front cash input’ requirement.
previous experience and participation in a Bushcare project acted as a catalyst to also participate in the IWM project.

Role of the demonstration water management sub-catchment and DEC

A demonstration site was planned and implemented as a first step. This was located on the properties of four of the landholders participating in this research. The IWM approach was tested at this demonstration sub-catchment over an area of 860ha in 2005 and 2006. The IWM approach was later scaled up to 19,000 hectares between 2007 and 2011 (Figure 7).

The role of the demonstration site in encouraging landholders to participate in IWM cannot be underestimated. Most landholders reported being impressed by the demonstration site as well as encouraged. Seeing how banks and waterways worked in practice, redirecting water flows through the landscape, gave confidence to those landholders thinking of participating. The demonstration
site also helped landholders imagine how the IWM approach would work on their own properties. Furthermore, most landholders also recalled following the developments at the demonstration site and were impressed how the site managed a significant weather event in December 2007. The revegetation component amazed most landholders as well, as trees were planted in a very dry year, but with a very high success rate (circa 90 percent).

This landholder sums up the meaning of the demonstration site in a concise way:

_The things we got out of that [demonstration site] was just seeing how the banks and water ways system actually worked, actually looked like physically on the ground. We could imagine what it would look like here then. And to see how well the trees could establish on the gravely hills, that was quite amazing. In a dry year that demo catchment was put in with a really good establishment of the trees. So that just gives you a bit more confidence in what’s going to happen on your place._

How was DEC and their work perceived in the IWM project by landholders? All landholders revealed positive views about DEC and their coordination work. DEC was held in high regard by all landholders and was praised for: good organisation skills, project management and planning, coordinating volunteers in tree planting activities, hiring contractors and showing their expertise to landholders in managing similar projects elsewhere. Additionally three landholders stated that the coordination work by DEC was integral to their decision to participate in the IWM project. As one landholder described:

_Well they [DEC] were very good, very organised, very meticulous – probably in some cases [...] too meticulous for me – I’m a pretty easy going sort of bloke. But very organised and well thought through and very flexible as well. [...] They did a good job._

**Figure 8:** L-R: John Stacy (participating landholder) is being interviewed by Rolan Deutekom (NACC) and filmed by Ralf Mulks (filmmaker) at John and Robyn Stacy’s farm (photograph: Rolan Deutekom)
Challenges and opportunities for improvement

No project is perfect, just as there is no research that is perfect (Goodrick 2011: 23). In general landholders were optimistic about their experiences in the IWM project. However, they did encounter challenges. Two landholders mentioned time scales as a major hurdle. As this landholder recounted:

*I think the most challenging aspect of the project was to fit it all into the one year timeframe that our particular farm was in. That was just impossible. It ended up happening over three years, which didn’t really affect me but it affected the money side of things and DEC’s involvement.*

Timing and planning around farm work proved to be challenging for some landholders. Government agencies, which in turn are dependent upon funding time frames set by Australian State and Federal governments, operate on different timescales than landholders. The latter are bound to necessary activities such as seeding and harvesting in specific months. In the IWM project there were opportunities for works to be completed on properties outside of the farming cycle. One landholder mentioned that these opportunities were not always taken:

*Within the project I found the timing very challenging. The timing of how people did not seem to realise the farming systems that we have - if we’re cropping only, there’s opportunities to do the work and these were not taken at the right time. I found that very challenging.*

Landholders reported a variety of other challenges. One landholder was displeased with the payment structure of contractors: they were paid per kilometre of bank construction. This landholder stated that he saw the payment structure as risky; contractors could be ‘rewarded’ for putting more banks in than necessary. Another landholder mentioned the weather conditions in 2006/2007 as challenging. Conditions in those years were too dry for bank construction; however other earthworks were completed in these years and most landholders and the contractor managed to work around these conditions.

Three landholders mentioned issues around fence construction. One landholder mentioned personal health issues as challenging: having a knee replacement when fence construction was required. Another landholder also reported issues around fencing:

*The most challenging was the fencing because that’s what we were responsible for. Fencing around remnants that are on hills involves drilling through rock, many - many corners and all done in January and February when it’s the hottest and flies are at their best.*
A third landholder mentioned the removal of fences prior to seeding as challenging. Health issues as well as weather conditions played a significant role here as well.

Dedication and interest in the project were challenging for one landholder. Without immersing oneself in IWM it wouldn’t have been possible to achieve the same results according to this landholder.

Landholders were asked if improvements could be made to future projects. Their responses resembled the challenges they faced. Timing and time scales were mentioned by several landholders.

One landholder summed up the issues with time scales and gave advice for improvement:

In the future it would be better to have a more long term approach, like a three, four, five year approach to projects. There are a lot of different areas that have to be all coordinated together and there’s a certain sequence that things have to be done. And if you have seasonal problems that mess up one aspect it just throws everything back. You also need to get earth works in first and then you have to decide where your fences go and then you put the trees inside the fences. [...] It has to be done in that order. So you just need time to do that.

Sometimes planning for earthworks, e.g. marking out banks, conflicted with farm activities like seeding. One landholder criticised this approach and advised instead to work around farm activities.

This landholder also recommended taking advantage of summer rains and constructing banks after the soil was moist. A dam that was constructed on this landholder’s property in the IWM project was not adequately pre-drilled and it ended up being “a bit of a mess”. Better planning and testing could perhaps have prevented this issue. Two other landholders suggested their desire for better organisation and coordination of the project, but they did not elaborate on this.

Improving communication was mentioned by two landholders. One landholder would like to have had information twelve months in advance about the location of tree planting activities in order to spray for weeds and reduce the weed seed bank. The second landholder did not elaborate on this issue, but did mention to be very satisfied with the works and IWM project.

One participating landholder would like to have had an “easier process” in deciding which parts of his property to use for conservation and which parts to use of production. That is, which areas of land to sacrifice “for the sake of the whole plan, knowing that we are cropping much more area than we are giving away.”
Final comments were made by two landholders concerning the construction of banks. One landholder wondered if the bank width was necessary. Another landholder was present while the banks were being constructed:

_I think it’s important - for the farmer - to work with the grader operator because I’m around the paddock all the time in a Landcruiser and I manage the running of sheep and I need to be able to cross the banks anywhere. I was communicating with the grader operator all the time to make sure that I was going to be able to cross the banks anywhere. And that just means that when he’s got the bank completed he just runs along, does another pass and just takes the peak off it. It doesn’t affect the effectiveness of the bank but it does mean that I can cross anywhere._

Interesting to note was that the pitch of the slope of the banks, as well as access across land through overpasses, were seemingly a bit more important for those landholders running livestock than those without. Working with farm machinery was sometimes more difficult for landholders after IWM works had been completed. One landholder mentioned that operating his machinery was more difficult due to smaller paddocks. However another landholder also mentioned better access to his paddocks due to less water erosion and inundation. Another landholder mentioned having learnt from the demonstration site and was able to secure access all over his land.⁸

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⁸ At the time of writing this research a draft report (DEC 2012) was written by DEC’s Recovery Catchments Officer that takes the above comments and feedback into account.
Lessons learnt and meanings of IWM

Most landholders indicated they had considerably increased their knowledge by participating in the IWM project. Although not common in qualitative social research (Pratt 2009 in Goodrick and Bessarab 2011: 25), landholders were asked to quantify their knowledge gains in IWM on a Lickert scale ranging from 1 to 5. Using this method, knowledge gains in the vicinity of 50-60 percent were achieved. One landholder stated:

*I think before the project - we didn’t know very much at all about it. One or a two [score], and then after the project, you’ll probably never say I’m a full bottle, so I better give myself a four.*

Landholders mentioned learning a lot about water management, but several also indicated they already had prior knowledge of this subject. Several landholders had knowledge and experience with banks and other earthworks on their properties, some of which were altered or removed in the IWM project. This landholder also shares his knowledge gains:

*My knowledge - well, I mean it’s just through visually seeing what happens when it rains and visually seeing damage done prior to me being here. You could see that when there’s a solid downpour […], water runs straight down hill or takes a natural course. And doing what’s been done: it’s shifted the water in a controlled way to a point where it had to get to anyway, but it’s been controlled, which is fantastic. So my knowledge prior would be two or three and I wouldn’t say I’m an expert at all but probably a little bit more knowledgeable now than I was. So three or four perhaps now.*

When landholder participants were asked what the project meant to them, a variety of issues were expressed. For one landholder the IWM project helped to deal with a traumatic event. For another it was about handing the farm over in a better condition: not letting it degrade any further and improving it. For some landholders it meant an integrated approach, combining revegetation and earthworks, where the water flow is more effectively managed. For one landholder it meant a better water supply, vegetation fenced off and an increase in vegetation and biodiversity for current and future generations to enjoy (see for example, Figure 10). Another landholder stated that the IWM project meant getting people with expertise to his farm to assist with water management and revegetation. In addition, this landholder also mentioned overall efficiency for the Australian…

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9 Vanclay identifies that many landholders (2004: 214-215) have a strong desire to leave their properties in a better condition than they found it and prefer to pass on the farm to their children.
Government and taxpayers, as the IWM project was simultaneously implemented over several properties. For another landholder the IWM project was a good opportunity and motivator to get works done that needed to be done, without carrying too much of the financial burden. Another landholder mentioned the commitment of DEC and other parties, as well as the longer time period over which this project was stretched-out as being very positive and meaningful. Another landholder mentioned that the IWM project was a way of keeping farmers interested and engaged in conservation and farming, and, more importantly keeping farmers out in the bush. This is what the IWM project meant to one landholder:

*More work. No it’s good in the end. Now, I can look around the farm and see that things work better and [...] I like my farm to be working well.*

Figure 10: At dusk, stunning tall woodland on Alison Doley’s (participating landholder) property (photograph: Rolan Deutekom). Many landholders in the Buntine-Marchagee NDRC feel strongly connected to remnant vegetation in an aesthetic and also a spiritual and philosophical way (CALM & Colmar Brunton 2005). This research shows that most landholders participating in IWM had a strong aesthetic connection with native vegetation.
Concluding remarks

This has been the first qualitative social research to document the experiences and perspectives of six landholders participating in an IWM project. In this research we’ve seen that the aim of the IWM project, improving water management through addressing salinity and other changes in landscape hydrology was clear to all landholders involved. Most landholders also mentioned the preventative nature of the IWM project. For example: managing significant weather events in a “calmer way”. Better water management, less erosion issues and satisfaction with revegetation were mentioned most by participating landholders as changes brought by the IWM project.

Reasons for landholders taking part in the IWM project varied. Most landholders mentioned the desire to improve water management, the opportunity to redesign paddocks and IWM works fitting with existing plans. The demonstration site, or the demonstration water management sub-catchment, was an important motivator for landholders and encouraged many to participate in the larger scale IWM project. Challenging issues for landholders in the IWM project were: short time scales, farm work overlapping with IWM work and (health) issues surrounding fence construction. Significant landholder knowledge gains of 50-60 percent were achieved as a result of participating in the IWM project. The IWM project carried a host of meanings varying from increases in biodiversity and vegetation to reducing the financial burden of landholders to engage in Natural Resource Management (NRM) projects.

I end this research with a quote from one of the participating landholders. A quote that makes clear that it is not only a one-way relationship with NRM projects shaping people’s experiences and perspectives, but also people shaping these projects in turn.

*The main messages I’d like to give people looking at doing this is to put a bit of effort in yourself and make sure things get done that you want done. If you have a half hearted approach to it and don’t give your input to it, then you won’t get what you want.*
References


Appendix: Interview Guide

1. Why did you take up the Integrated Water Management incentive? What were the perceived benefits (for you as a landholder, for the land)?

2. What has happened on your property in the context of the Integrated Water Management (IWM) project?

3. What on-ground changes have you seen since the completion of the project? What was the on-ground situation like before and after getting involved in Integrated Water Management?

4. What is your farming business? Mixed or cropping only? Did this influence your decision to implement Integrated Water Management actions on your farm?

5. To what extent did the ‘demonstration’ water management sub-catchment influence your decision to apply the Integrated Water Management approach?

6. To what extent did the coordination work by DEC influence your decision to apply the Integrated Water Management approach?

7. What was rewarding about the project? What did you find the best part of the project?

8. What improvements could be made in future projects?

9. Please indicate your knowledge level on IWM before and after on a scale from 1 to 5. Please indicate your perceived benefit for the land.

10. Have your expectations of the on-ground works, as originally agreed to, been met?

11. What did you find most challenging in the project?

12. What are the main messages you would give other landholders who are considering the Integrated Water Management approach?

13. What did the project mean to you?

14. What did you think of the fact that the project was composed of an integrated package?

15. Is there anything else you would like to say about the project?