Lessons from applying the principles of the Salinity Investment Framework at a local level in catchment and farm planning

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Abstract. From early 2005 a comprehensive catchment planning and implementation plan has been operating in the Oyster Harbour Catchment of WA. Planning was carried out using the principles of the Salinity Investment Framework (SIF) relating to the recovery, containment or adaptation to NRM risks. This was achieved through a staged process using technical specialists in partnership with local farmers and the OHCG. Out of a potential 28 subcatchments, 10 were eventually chosen to be approached based on the technical information and local knowledge of the OHCG. Land managers in these 10 subcatchments were sent invitations to a series of information meetings where they were given the choice of becoming involved. The OHCG was then approached by four of these groups who were given presentations within their catchments; out of this three target subcatchments moved on to farm planning. Planning concentrated on combining farming needs with technical risk information. Each land manager developed a farm plan with the proposed works identified and a written document outlining the works agreed to. This then formed the basis for the catchment plan that included comprehensive risk and management data that backed up the implementation plan submitted for funding.

Introduction

The OHCG is a community organisation run by landholders which focuses on improving the environmental and economic conditions of the catchment. In 2004-05, the group was approached by the Department of Agriculture and Food (DAFWA) and South Coast Natural Resource Management Inc (South Coast NRM) to ascertain interest in developing a catchment plan which would be funded by the State and Federal Governments and landholders. This plan had the shared objectives of containing salinity, nutrients and other land degradation processes in targeted sub catchments of the Oyster Harbour catchment over a 25yr time frame.

A comprehensive planning process was initiated that built upon the lessons learnt from previous projects with the aim of driving long term ownership, engagement and implementation. This paper outlines the processes and approaches used to develop the plan and will explore some of the key learning's that we discovered along the path to adoption.

Extension approach

Several previous projects like the Sustainable Grazing on Saline Land SGSL program and the Focus Catchment process adopted a participative extension approach (Hardy et al 2006). When considering how to progress this project the benefits of this approach were clear and a modified version of the model was adopted (Mortiss 1993).

Emphasis was placed on a training/skills development model. This was necessary due to the time constraints involved and the need to extend complex information on multiple issues. It was recognised however that this would not be sufficient in itself; therefore, landholders were encouraged to bring forward their goals and desired outcomes so that these could be incorporated into the planning process. This generated considerable ownership and engagement through the part incorporation of a self directed learning cycle (Jarvis 1983).

The process was issues driven with the incorporation of both technical and community targets however without clear practical outcomes and approaches we would loose our audience so we incorporated measurable outcomes and activities the landholders could relate to. This meant taking broad catchment issues and making them relevant at a property and paddock level.

The planning process

A process was initiated to determine which catchments across the region would be selected to undergo catchment planning. Priority catchments were selected based upon their assets, threats and values attributed to these assets from both a technical and a community standpoint. The evaluation of assets was undertaken with regional communities supported by technical information from local NRM agencies. The South Coast region had a primary focus on Tier 1 assets and used a value-threat matrix adapted from SIF (the Salinity Investment Framework) to determine the strategic catchments and assessing all NRM risks (Ridley et al 2006). The Agency statement on Natural Resource Assets in WA was also produced to provide guidance for communities and provided input into the catchment selection process.

Once the Oyster Harbour catchment was selected as a priority it was the community groups that took ownership and drove the process in order for there to be a successful outcome. Analysis was undertaken which identified the top half of the catchment as being under major threat from salinity. This also matched what the OHCG understood about this area's capacity and willingness to invest, however this still included half of the whole catchment and 28 sub catchments. What followed was then a staged process of engagement and planning that would lead to three sub-catchments going through to planning and implementation.

Ten sub catchments were identified as having the potential to develop a full catchment and implementation plan. Letters were sent to all of the landholders in the 10 sub catchments inviting them to two forums that were held in the area. Night meetings were organised to further explain how the planning would develop with technical specialists available at all of the community planning sessions. Key to this was the message that it was up to the landholders to make the decision to proceed, effectively they had to make the first move. This emphasis on participative extension and engagement principles was pivotal to the planning processes and built upon the principles and practices used in NRM for many years.

Three sub catchments moved through to planning and implementation which involved broad conceptual catchment planning to encourage catchment wide cross boundary thinking in each of the sub catchments. Following this was a farm planning exercise which was then assessed for potential impact on NRM issues before being collated into the final catchment and implementation plan.

The total works that were proposed are spread over approximately 30,000 ha. The total proposed works were 5,448 ha perennials, 336 ha re-vegetation, 475 ha farm forestry, 236 km of fencing and 15.6 km of drainage. All these actions complimented 4,972 ha of native vegetation and 1800 ha of farm forestry between the three sub-catchments. The impact of the proposed on recharge, nutrient loss and sedimentation was reviewed. It was estimated that recharge would be reduced by 53% and Phosphorous and Nitrogen 20% and 30% respectively. The OHCG has been able to get more than 80% participation of all land managers through a transparent and thorough process in the early stages of project planning.

Technical support

The provision of technical support in all stages of the planning process was a critical factor in the success of the planning process. It gave participants confidence in the planning and implementation stages, also reassuring potential funders that their investment would to the best of our knowledge deliver the desired outcomes. Though several issues were considered, hydrology was considered the key issue and has been explored in more detail.

Hydrology

The development of the catchment plan relied heavily on good hydrological support to allow an educated decision to be made on sub catchment selection. Advice was critical to several stages of the planning process however the key stages were,

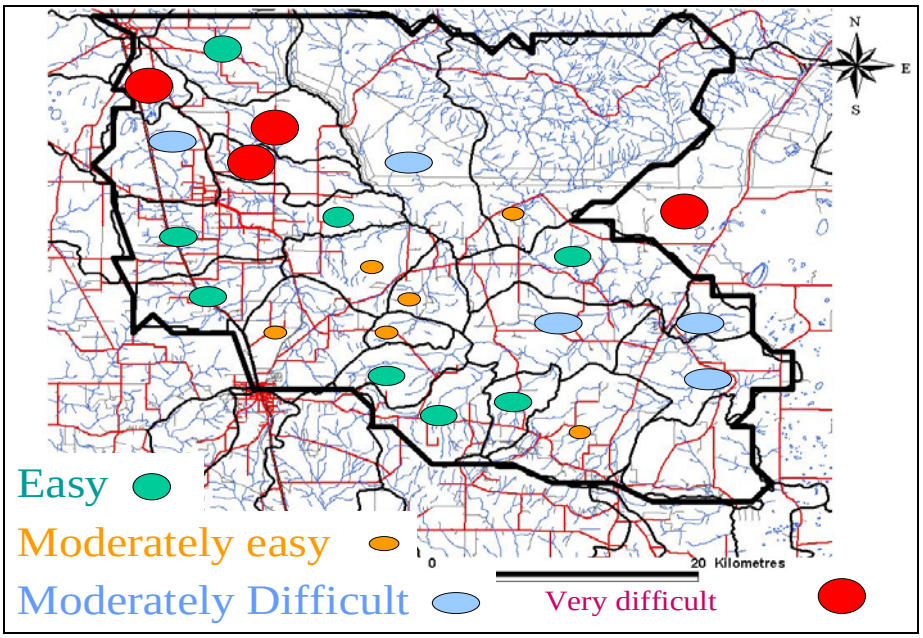
- Selection of the Oyster Harbour Catchment
- Ranking of the sub catchments for ease of treatment to allow a selection of priority sub catchments
- Assessment of scale of treatments required at a catchment level
- Analysis of impact of proposed treatments.

Stages of support

Stage 1 Selection of the Oyster Harbour strategic catchments. The initial selection of the Oyster Harbour catchment as a priority catchment involved the assessment of hydrological and NRM risk, economic and social factors. This involved using the principles of SIF in a framework to consider the possibility of recovery (R), containment (C) or adaption (A) to salinity. (Sparks et al 2006, Ferdowsian 2005).

Stage 2 Assessment of sub catchments. Sub catchments were ranked according to the possibility of achieving the containment or recovery of salinity. Each subcatchment was assessed individually against a series of criteria related to landscape, soils, size of aquifer, drainage density, remnant vegetation and so forth to generate a score. This was used to rank the subcatchments as per Figure 1 into four categories that reflect the ease of treatment and the possibility of achieving R, C or A (Ferdowsian 2005).

Figure 1. ranking of sub catchments in middle – upper Kalgan catchments (Ferdowsian, 2005)



Stage 3 Scale of treatments required. It was critical that landholders entered into the planning process with as much information as possible. As a result an assessment was carried out on the scale of intervention required to contain or recover the salinity issue for each of the three strategic sub catchments.

Flow tube analysis was carried out to give an indication of the amount of landuse change required to make a measurable impact on recharge and salinity. Models were run for a variety of treatments and compared against the standard landuses (ferdowsian 2005). This information was then presented to the landholders at sub catchment meetings allowing to them to make better informed decisions on their involvement and commitment. A range of landuses and mitigation options were discussed including engineering options, riparian restoration, revegetation, perennial pastures and so forth.

Stage 4 Analysis of impact of treatment. After the farm planning event all plans were assessed for the level of impact on the recharge and salinisation within the catchment. This feedback was provided to the landholders and in some cases negotiation occurred on the proposed level of activity and position in the landscape. This analysis used a number of modelling tools as well as detailed local knowledge and was critical to the implementation phase. It gave both landholders and state and federal funder's justification for the investment of public dollars and confidence in the potential impact this investment might have.

Other NRM issues

Though the issues revolving around salinity were a major focus of the project other NRM issues were also considered in the development of the plan. These included erosion, nutrient loss, soil health and biodiversity. These issues were tackled at various stages of the planning processes and formed an integral part of the implementation with detailed analysis carried out on the impact of the proposed works on N and P losses from the subcatchments. This nutrient loss analysis was carried out using modelling undertaken in the catchment and gave an indication of the sort of changes that might be expected given the indicated levels of adoption (Weaver et al 1997)

Issues like soil health and erosion control tended to focus on hotspots or areas of identified degradation however there was as a strong link with the perennial pasture establishment, which was guided by hydrological assessment; to try and achieve an increased impact and hit multiple issues (e.g. salinity and erosion control).

Support for implementation

Great emphasis was placed on providing good quality support and information for implementation of farm and catchment plans. This was especially critical for perennial pastures, engineering and soil health activities. Field days were held on a number of issues related to

these and other activities and every farm that wanted to implement works was visited to provide site specific information.

Community planning and implementation considerations

A number of planning and implementation considerations were confronted and addressed over the duration of the project.

Planning issues included tight timelines, changing environmental focus, funding rates were unavailable, varying skill sets and understanding among project participants, no pre-implementation monitoring and evaluation (no M&E question) and no bio-diversity or invasive species technical support. However, these unknowns did spark a positive result; the project was built more on community goodwill and a desire to be more environmentally sustainable rather than on what financial assistance was available. The effect of this gave the project participants better ownership of the project therefore increasing the likelihood of a successful outcome. Another factor that helped land manager project involvement was a heavy rainfall event in 2005 that saw massive movement of sediments and increased erosion pressures and waterlogging damage.

Themes such as bio-diversity and invasive species were not originally included in the plan as there was no structure or technical support in place to facilitate this. These themes were eventually incorporated into the plan once capacity was built in these areas. Monitoring and evaluation was originally incorporated into the plan at the point of investment however it has been of limited assistance due to lack of rainfall and delays in establishing infrastructure.

Implementation of the project has also encountered some unforeseen circumstances usually found in large scale projects. These include lack of appropriate seed stocks to support the level of implementation, lack of adequately trained contractors (particularly engineering), poor seasonal conditions, changes in land use (facilitated by the high return on cereals) and extreme natural events (bushfire and locust plague). Each of these has been addressed as they occurred in one way or another but all relied upon a flexible implementation plan and robust contract variation system through the regional contract managers.

Lessons learnt from this experience is that plans had to be flexible to accommodate any changes in social, economic or environmental circumstance, that a robust monitoring and evaluation process is in place prior to implementation, reinvestment and recognition of on-ground failure, accept a level of failure when trying something new and better acknowledgement of project participants contribution at state and national levels.

Conclusion / key learning's

Participative learning principles underpinned all of the activities undertaken in developing the catchment plans implemented in the Oyster Harbour. This approach however would have failed without access to good technical support throughout the process.

There were several key learning's which we discovered as the planning process progressed. These were:

- The plan has to be flexible to take account for environmental, social and economic changes.
- An experienced and locally based project coordinator bought benefits such as existing linkages into the community, sound local knowledge and community trust.
- SIF principles allowed for a logical process for the selection of target areas and the allocation of resources; however the SIF Model as it exists is not capable of integrating multiple NRM issues.
- The use of a participatory approach of landholders and technical specialists working together provided greater transparency for decision making at a local level and created greater ownership of the project.
- Our approach was flexible enough to include the consideration of other NRM issues not just salinity and to adapt to issues out of our control e.g. drought, lack of seed for critical species etc.

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