Mowanjum Irrigation Trial

Site selection and infrastructure

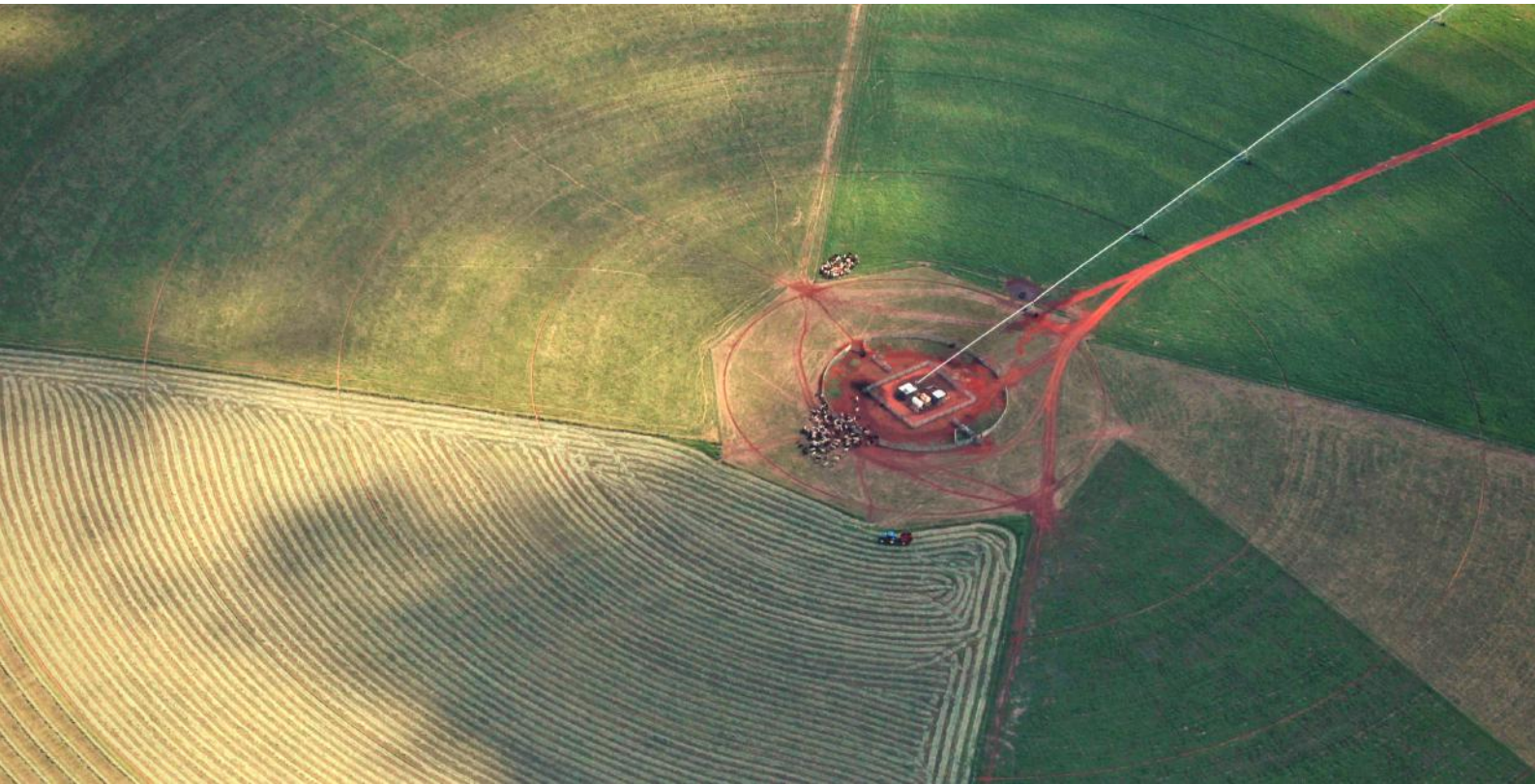
The importance of planning in the early stages of site selection and infrastructure design cannot be underestimated. Time and effort spent in identifying the best site will be returned through improved productivity, streamlined approval processes, reduced development and operational costs, longevity and scalability of the system.

Begin with the end in mind and understand the site

- Confirm what the enterprise is trying to achieve and how the irrigation system will be integrated into the current and future business models.
- Identify what scale is needed and what the system design requirements are including; how this can be scaled up in the future.
- Understand how the site characteristics of soils, topography, climate (temperature, rainfall, and wind speed), groundwater (depth and yield) and infrastructure (current and required) are aligned with the development model.
- The costs of lifting and pumping water, and applying fertiliser are the largest operational overheads. Time spent refining and understanding the site will yield long term savings. A poor site will always be a poor site no matter how much money is invested.
- Consider what the supporting infrastructure requirements for the operations are, what infrastructure may already be available and where that infrastructure is located - year round road access, stock handling facilities, storage and maintenance sheds, and accommodation.

Plan for the approval process

- Approvals and requirements may include and not be limited to a native vegetation clearing permit, water licence, development approval, diversification permit, building license, land tenure change, Native Title and heritage clearances.
- Prior planning and site selection will deliver the best outcomes through the approval process. Get the site right the first time and avoid changes during the approval process.
- Align the development model to the most appropriate approval strategy and submit applications concurrently. Take an active interest in these.
- Assessments and surveys are required and will take time and may be affected by seasonable variations. Plan for these and be clear on what the expectations and criteria are and how these will be assessed.



Considerations for Infrastructure and system design

- Understand the energy requirements of the system (pumping, irrigation, fertigation, plant and equipment) and identify the most efficient and effective energy source (diesel, solar, gas, hybrid) and supply pathway.
- Design the supporting infrastructure (sheds, laneways and yard) and pivot infrastructure (fencing, lanes, wheel gates, fuel, pumps, troughs) to allow for scalability and adaptability.
- Ensure the system is designed to withstand extreme events and protect assets, both mechanical and electrical.
- Ensure the system design, plant and equipment is fit for purpose, value for money, and has access to reliable after sale support services. System down time will make or break the profitability of an irrigation operation.
- Consider what technology options are available and required and the adaptability of the system to future technology upgrades.

What do we have, what has worked well and what would be need to improve?

- Four grazing cells connected to a central yard for watering and weighing. The cells are established with permanent fencing and spring loaded gates (above) to allow the pivot to pass through. This enables control and management of stock and pasture growth.
- The initial fencing system was electric which proved to be problematic for grazing management and pasture growth.
- Native vegetation surrounding the pivot enables cattle to access shade. The extent of native vegetation must aid efficient cattle movement onto and off the pivot.
- The pivot is close to the highway with all-weather road access and in close proximity to the equipment sheds and main yards. The yards, holding and backgrounding paddocks are all connected through a series of laneways enabling ease of cattle movement.
- Infrastructure has been refined over the course of the trial and adapted to suit the ‘Stand and Graze’ operation. Improvements have included lightning protection, data uplinks, fixed fencing between cells, and energy systems. The infrastructure and equipment associated with this will accommodate continued future expansion of the irrigation operations.
- Future improvements may include refinement and integration of the energy system and the introduction of new technologies.
- Operational improvements have been made over the course of the trial to reduce power consumption associated with groundwater lifting, pumping and fertigation. These efficiency gains have been made through improved knowledge about pasture, grazing systems and groundwater response.

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