



## Developing new technologies and systems

This factsheet is about helping to build the capacity of individuals using an extension model called the **technological development** model. As its name suggests, the technological development model is about individuals working together to develop specific technologies, management practices or decision support systems which will then be available to the rest of the industry or community.

A key underlying assumption in the model is that specific positive technological (including managerial, landscape and environmental) change requires a focused effort and should involve all stakeholders in the process. The technologies or practices that can be effectively developed in isolation and handed down to a waiting industry or community are rare. New technology is far more likely to be adopted if potential users are closely involved in its development. Participation and multiple approaches appear to be fundamental to successful projects in this model.

This model is one of five identified by research commissioned by the Cooperative Venture for Capacity Building (CVCB). In a 2-year national review of extension and education across Australia, Jeff Coutts, Kate Roberts, and Fionnuala Frost identified characteristics of different extension models (see box) and used these, along with other information, to develop indicators for success for each of the models.

### ***Extension models***

**Facilitation and empowerment.** This model focuses on participants increasing their own capacity in planning and decision-making and in seeking their own education and training needs based on their situation. Groups may do their own research. The project will often provide or fund a facilitator to assist groups to define their own goals and learning needs and to help them realise these.

**Technological development.** This model is about individuals working together to develop specific technologies, management practices or decision support systems which will then be available to the rest of the industry or community. It often involves local trials, demonstrations, field days and on-site visits.

**Training.** This model is about delivering specifically designed training programs and workshops to targeted groups of landholders, community members, government personnel and others to increase understanding or skills in defined areas.

**Information.** This model is about providing a range of information that individuals and groups can access from a distance and at a time that suits them. It can be based on a website, information centre or other centralised locations.

**Consultant.** This model recognises the interaction between a mentor or a consultant who works over time with an individual or community to improve their managerial, technological, social or environmental situation - or individuals from different backgrounds working together on a 1:1 basis.

## USING TECHNOLOGICAL DEVELOPMENT PROJECTS TO BUILD CAPACITY

The main reason to develop projects under this model is to use or develop a specific technology or management practice to deal with a particular issue. The project may involve the development of new technology to deal with the issue or it may involve taking the results of existing research and testing, and adapting and integrating this research so that it can be used in practice.

Some other reasons to consider developing projects under this model include:

- using technology to develop new management strategies
- increasing knowledge about a technological model or system by experimenting with it in practice
- developing specific technology
- using technology with groups.

The advantages of these projects from a capacity building perspective are as follows:

- technological knowledge is used to improve management in particular situations
- they increase knowledge by experimenting in practice
- they stimulate the development of new technology
- they help groups take advantage of technological knowledge.

Examples of such projects include the Rural Water Use Efficiency project in Queensland, which aimed to improve water use efficiency in the cotton, grains, horticulture and sugar irrigation industries; the Profitable Pastures project in WA, which aimed to improve management of pastures in the dairy industry; and the CITTgroups project, which used facilitators to translate and make available to citrus growers the results of the latest research activities.

## KEYS TO SUCCESS

The research identified a number of keys to developing and implementing successful extension projects under this model.

**Extension/facilitator skills and activities.** These are critical in addressing technological development issues in a region or industry. It is important that extension officers are able to develop a variety of ways for people to access and use new technology.

**Practitioner level of technological understanding.** Projects should take account of the current level of understanding of technological change and the motivation and confidence of practitioners to adopt technological changes.

**Facilitating information sharing between participants.** This is a critical element in getting practitioners to accept and adopt new approaches and technologies. To help do this it might be necessary to set up regional or other meetings which allow people to interact and gain information in a neutral place.

**Producer leadership and ownership.** Leadership and ownership by producers of projects aimed at technological development and implementation are critical if technologies are to be broadly supported and accepted. This support and acceptance can be obtained in a number of ways including:

- Making sure that the technological issue being targeted by the project is seen as a key issue to be dealt with by the target audience.
- Establishing on-farm and local trials to aid understanding and acceptance of new approaches.
- Using benchmarking as a way to document change and provide ongoing encouragement and motivation.
- Providing proactive on-farm support. This helps bring about change in a relatively short time and helps both the extension staff and participants to learn.
- Linking with local commercial expertise is important in terms of bringing about sustainable change processes.

**Sufficient resources and other supporting mechanisms.** Resources and support for the project should be in place to ensure successful outcomes. This means that there should not only be enough resources to carry out the work of the project itself but also other mechanisms such as incentives to adopt should also be in place. For example, incentives have been offered in the Rural Water Use Efficiency project to help people upgrade their irrigation systems.

**Access to training.** Because this model deals in new technologies and systems, providing access to training in these areas may be important to the project. Training should be available to producer participants and to other project stakeholders as well.

## ASSESSING PROJECTS UNDER THIS MODEL

The table below provides a way to check that all the important issues affecting a technological development project have been addressed.

Element	Comments	Ranking (1-5 where 5 is fully covered and 1 is not covered )
Issue or need identified by industry or community or endorsed by representatives.	A perceived need may arise in any group, but all key stakeholders need to be convinced of the need.	
Facilitation provided to mobilise and assist in process.	Facilitative extension skills are critical in gaining broad involvement and providing an action plan.	
Process to inform and involve stakeholders in problem definition and determining approaches to tackling it.	Steps need to be explicit as to how the stakeholders will become engaged.	
Committees and/or forums to provide on-going local input and feedback apart from hands-on participants in process.	These formal mechanisms have been shown to have real benefit in providing 'safe' places for inputs and needed feedback.	
The process is designed to allow researchers/experts and producers/ community participants to work together.	The point is that this should be a participative process recognising the strengths of all.	
There is a strong on-farm/on-site trial and demonstration and assistance component.	In some cases, on-farm trials may mirror – or extend – formal research sites.	
Benchmarking is a key feature of tracking benefits and progress.	Change resulting from the technological information and its impact needs to be measurable for stakeholders to gauge benefits and progress.	
Other supporting mechanisms are available to assist development and integration – such as incentives, policy etc.	It is in the context of the mix that assists in motivation and action on desirable changes.	
Training in relevant areas is made available.	Training can help participants catch up with pre-existing knowledge about the technology or management issue.	

### ***About the project***

"What Works and Why" was funded by the Cooperative Venture for Capacity Building and Innovation in Rural Industries. The aims of the project were to evaluate extension and education programs being implemented around Australia, looking at best practice as a means of sharing and learning, and to identify how new guidelines, principles and tools will generate effective information and learning.

Researchers were Jeff Coutts, Kate Roberts and Finnoula Frost.

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