

Chapter No 4

Case Study B: Dairy Farmers

This case study includes the responses collected from the seven Dairy Farmers (DFs) from NSW and Victoria. Themes and sub-themes that emerged from the data were identified and noted within the responses of the participants. The responses of the participants were divided into two main themes, being extension strategies and perceptions. The extension strategies represent what the farmers indicated they were participating and perceptions were the opinions of DFs regarding the extension strategies they indicated they engaged in. These themes were further divided into sub-themes (fig. 4.1). The main themes and sub themes are discussed and interpreted here in relation to their relevance to the effectiveness of extension practices of NSW and Victoria dairy professionals; interpreted through the action and perceptions of the DFs.

- 4.1. Extension Strategies
 - 4.1.1. Group extension
 - 4.1.2. One to one extension
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 - 4.2.3. Rationale for Actions
 - 4.2.4. Outcomes of the strategies used
 - 4.2.5. Advice to other dairy farmers

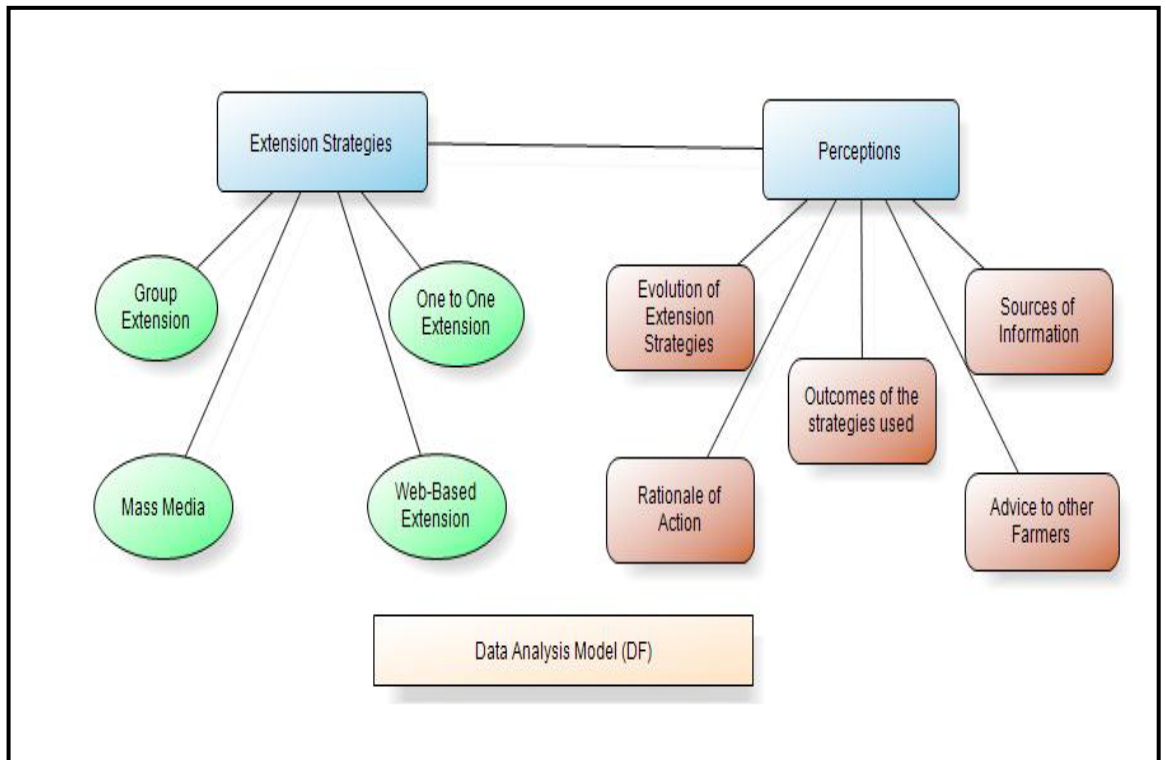


Figure 4.1: Data analysis model created from responses of Dairy Farmers (relating to the extension strategies adopted, and perceptions regarding using the strategies)

4.1.Extension Strategies

Five of the seven DFs indicated that they use group extension (fig.4.2) and believed that this form of extension to be a ‘learning process’. These DFs also indicated that they believe farmers’ in general, to be very selective in obtaining information and as their interest is always need-based, they select the information which they really need. They also indicated that they felt there are always activities available like field days, discussion groups, seminars, and short training sessions etc, arranged by government departments or private extension providers. Many researchers (Kerby et al, 1996; Vanclay & Lawrence, 1995; Marsh et al, 2000) have described the many advantages of group extension, such as: it is based on participatory adult learning process; provides encouragement for the farmers; provides a good platform for information delivery and experience sharing and; provides a scaffold for information delivery of different range of factors. It is noteworthy that these observations are well aligned with the perceptions of the DFs of the current study. However, there are some limitations to the group extension approach, including some farmers being over-shadowed by others and over-representation of farmers with greater wealth and larger properties, coupled with a lack of involvement of women in implementation of activities (Kerby et al, 1996). In the current study, it was observed that follow up on extension activities is important and

most of the DFs (5 out of 7) indirectly pointed out the need for a ‘multiple approach’. These 5 DFs specifically indicated that it is good if group extension is followed up by one to one extension. It was noted that the follow-up one to one consultation does not necessarily need to be direct but can be through web or Information Technology (IT) communications. The importance of this IT approach was also indicated by twelve EPs in the previous chapter. The EPs pointed out that information is always available; farmers just need to select the most appropriate information and adopt it accordingly. The 5 DFs also believed that group extension strategy provides a platform for the dairy farmers to see things practically on other farms and learn from other fellow farmers. It was observed that experience sharing and feedback among the farmers as well as extension professionals, helps in the effective delivery of extension services. One DF also noted they appreciated the role of mass media and private consultants in effective extension delivery.

Along with the use group extension, three DFs considered one to one extension as the most effective strategy. These farmers identified one to one extension as is the most expensive strategy; however they preferred it to group extension as it provided direct solutions to farmers’ problems. This preference is reflected in the noted view that many farmers are even happy to pay to get one to one consultations from private extension providers.

One on one extension is the most effective strategy but expensive, provides direct and quick solution to farmers’ problems. (JFV, TFV & RFN)

The observations from the 3 DFs (JFV, TFV and RFN) identified advantages of one to one extension for farmers as; obtaining specific help for specific problems, doing strength, weaknesses, opportunity and treat (SWOT) analysis for their farms, gaining professional support and helping with monitoring and evaluation of farms. However, some limitations to one to one extension including that it is time consuming, expensive and needs resources.

Overall all DFs indicated they used the four extension identified strategies, directly or indirectly in some way. In reference to any extension strategy 5 of 7 farmers indicated the need to always be aware of the context of the advice given and to be very selective and careful in adopting the most appropriate and accurate advice according to the immediate and identified need.

As a source of information, two of the DFs indicated the use of mass media and two indicated web based extension as important. These four DFs also added that they believed most DFs were getting information from mass media and web-based extension and they indicated that they believed the use of these strategies was helping farmers in general to be innovative and to better understand technologies. It was also observed that most of the DFs use these two strategies for obtaining additional information. The detailed use of these strategies is described in the next themes.

It was noted that one DF participant was not in favour of any extension strategy currently available, as he indicated he was not using any formal extension strategy. The participant considered extension activities as “*waste of time*”. This DF preferred doing things on his own and added that he felt that the extension providers only provide theory, not practical assistance or support which he indicated he thought was most important. However within discussion this DF did indicate that he sourced most of the information he used from mass media, which is noted as a recognized extension strategy (fig.4.2). Some of the DF’s responses were;

I get no information from anyone, I do everything all by myself. Planning, how to milk, crops, everything I do all by myself. (DFN)

Yes I did attend field days but those were just that they provide no practical help. They didn’t plan anything for me; I did all my pasture planning by myself. (DFN)

Interestingly, the other six DFs did mention that it is not possible for practical assistance (in terms of one to one consultation) to be provided GEPs for individual farmer, so they were using the services of consultants (PEPs) who specialise in the provision of this service.

In short responses from this participant (DFN - fig.4.2) indicated a belief that extension professionals are supposed to do practical things for farmers and that Extension Professionals (EPs) need to do the planning for farmers. It is interesting to consider if this is a realistic expectation as GEPs clearly have a strategy for mostly dealing with groups and private consultants appear to be placed to provide one to one extension and the additional the practical help like planning. It is apparent that GEPs are placed to service the needs of the whole industry, while consultants (PEPs) are able to target special needs and specific services on a fee for service basis.

It has been observed from this study that, DFs are also engaged in the four major extension strategies; group, one to one, mass media and web-based extension (fig.4.2). All of the four strategies are noted as helping farmers learning, and are further discussed in the light of DFs perceptions on how to use these strategies effectively. It is worth noting at this point that the indicated application and use of the strategies varied considerably among the participants.

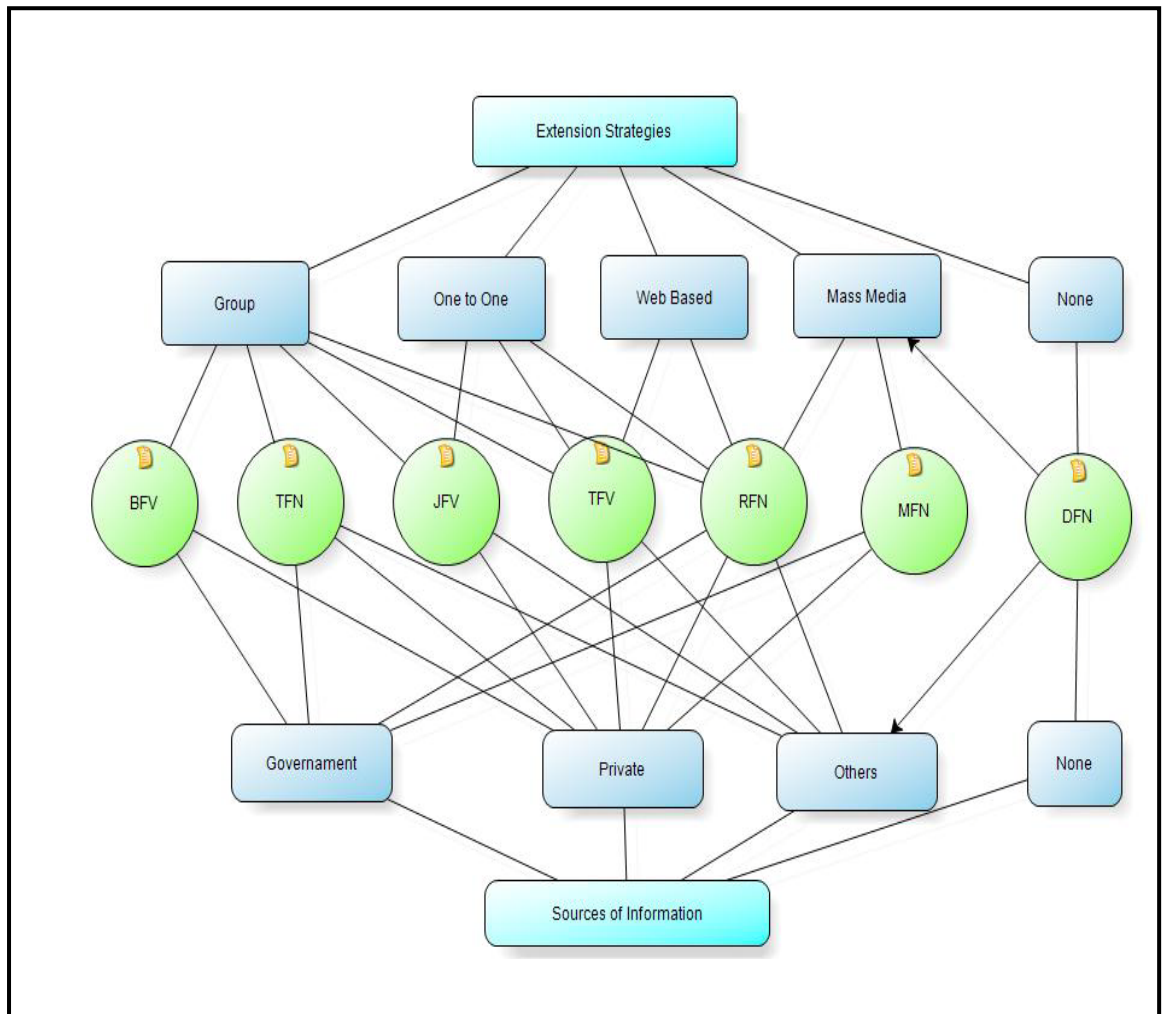


Figure 4.2: Model representing the four extension strategies (Actions) and three major sources of information (Perceptions) used by the participants (green circles=dairy farmers)

4.2.Perceptions:

The DF's perception of the Extension Strategies in-use provides a basis for match and mismatch of perceptions and services provided by the EPs. In this way insights on how things might work better have been revealed; these insights are discussed below.

4.2.1.Sources of Information

All the participants indicated that there were three sources of information for extension services delivery (fig.4.2); Government Extension Professionals (GEPs), Private Extension Professionals (PEPs) and other sources. Other sources were noted as newsletters, magazines, trainings, web base, and other farmers etc.

Four DFs indicated they mostly access information from GEPs and considered this information generally more useful, compared to information from PEPs. However, specific information provided by PEPs for solving specific issues was also noted as important. They acknowledged the extension provided by GEPs and believed that they were good source of help and support for farmers, further indicating that they felt the GEPs worked with the farmers and for the farmers. However, insight from case study A (in the previous chapter) indicates that GEPs mostly provide participatory group base extension and only PEPs (consultants) provide one to one extension to farmers. The 4 DFs also added that sometimes GEPs only follow their project or program objectives and therefore mostly provide information based on or around the context of their projects. For example, pasture projects like 'pasture Australia' and mastitis control projects like 'countdown' can dominate the nature of information provided because these projects have specific goals. However it is likely that the information provided could be useful for specific farmers. In summary these 4 DFs considered the project based information provided as useful but sometimes not in line with farmer specific needs.

Three of these four DFs added that GEPs provide networking opportunities with EPs as well as other DFs. It was noted that networking with EPs helped the farmers in getting regular updates regarding extension activities, government policies and the industry insights. However, it has been observed that networking with other farmers is good for information transfer, experience sharing and feedback. The importance of networking mentioned by Curtis, et al. (1999), suggested that networks are important and enhance the impact of groups by improving inter-group communication and 'pulling down' resources. The 'pulling down' of resources was described as looking for new

information. Two of the four DFs indicated that the EPs are effectively using principles of adult learning as a platform for the experience sharing, innovation and adoption, practice change and technology transfer for farmers. This may indicate that the extension professionals are working more as facilitators rather than experts in technology. These four DFs also indicated that they believed the wide range of information provided by the GEPs may not always fit to everyone farm, but that there were some useful take home messages to be had in any case.

Services provided by government extension people are better, but all the things are not related to everyone, you just get what fits into your system. (MFN)

This statement reflects the importance of group extension provided by GEPs, which was seen as good for the learning process. However, this also shows that these specific DFs like the mixed approach of group extension followed by one on one consultation. This follow up by one to one consultation may possibly help in solving the specific farmers' needs.

Six out of seven participants indicated using the services of PEPs and added that they provide problem solving one to one consultation. However, this one to one consultation was noted as being expensive and as a consequence the use of one to one extension is mostly limited to specific problem solving and planning. In contrast, the EPs associated with feed, health and milking machine companies etc were noted as providing free one to one and group consultations to farmers. It was indicated by three DFs that these EPs connected to private companies provide commodity based extension, mostly to promote their products. Interestingly it was also observed that in addition to the sales approach of the retail products, they do provide some useful information to farmers.

Private companies, like milking machine, feeds, Pfizer, and cropping agronomist, etc, whose representatives visit the farm and provide some useful information. (RFN)

We get whatever we can, but we have also seen that most of them do not work. The problem is most of the extension work here is funded by chemical companies, so they pushed their products. (MFN)

Although there are general and specific information available to farmers, it depends on the farmers' situation that what is relevant for them. It was suggested by four DFs that

farmers need to use their networks to review advice before adopting any new information. The networking of farmers and EPs following by web base extension could possible help in establishing the relevance of the information being circulated.

Four DFs indicated the use of other sources of information aligned with using the services of GEPs and PEPs. The other information sources mentioned were newsletters, magazines, trainings, web base, and other farmers. They added that these sources provided good information, within the reach of every farmer and available anytime. They noted that they believed that these other sources of information are the best means of extension for farmers. This indicated that the information from print media was still considered to be important, as the farmers indicated they obtained plenty of useful information from magazines, newsletters, and newspapers. However, all four DFs highlighted that the use of web-based information, i.e. the accessing and use of information from websites; emails, e-magazines etc, is gaining popularity. They indicated that they believe farmers are moving towards the use of these new and 'smart' technologies and the use of internet for business purpose has been improved. In 2007-08, 66% of farms were using the Internet for business operations and the use of the Internet across states and territories ranged from 74% in Australia (ABS, 2008). 'Smart' technologies (smart phones and gadgets like I phone, I pad, and tablets) are now commonly used by farmers. The farmers in the current study also added that due to the introduction of the web-based information, they perceived that young people, including their children, have also started taking interest in the farming. Interestingly, they believe this interest may overcome a concern explained by three DFs as 'the loss of interest of youth in farming' leading to a low likelihood of children taking over the family business after their parents retire. This shows that one of the important benefits of web-based information is possibility of this technology improving the attraction of farming to a new generation of farmers.

One of the reasons, explained by DFs, for supporting web-based technologies is the easy access of information at any time. In addition these four DFs also indicated that they believed farmers are always busy in farm work, as farming is an extensive fulltime job, and therefore often not able to attend extension events. They indicated that information technology advances were enabling farmers to more easily obtain information if they were to miss any extension event, training, conference or workshop. However, three of

the four DFs showed their concerned that although web is one of the best ways of information transfer, it is not used by every farmer. They added that the old generations of farmers are not familiar with web based technologies and they probably need training.

There are probably a lot of sources but internet would be a major one. I am on the email list of Gibbs dairy, so we the dairy farmers discuss many things on emails and share our experiences and having some fantastic discussion. Internet is also good for looking and finding any information, like Google or dairy Australia website. (TFV)

This response reflects basic use of web technologies by a user. This participant has simply presented the application of some basic web technologies, like email and internet surfing. In addition, four of the seven DFs have shown interest in the use of web base technologies and perceived that it has a good future.

It has been observed from the participants' responses that web base technologies can enhance farmers' learning and change the traditional farming to the IT based farming. The web based technology can also help solving the concern of farmers' 'youth not taking interest in farming' by attracting them to farming. Most importantly, web based technologies seems to have possible IT impact on the farmer to farmer and farmer to EPs networking. This reflects the new vision of extension through institutional development which supports the facilitation in networking, learning and negotiation processes within and amongst institutional stakeholders, programs and networks (SELN, 2006). In the current study the interest of the participants for participatory learning and effective networking has been observed consistently throughout the themes.

Interestingly, only one DF indicated that he is not using any sourcing of information from GEPs or PEPs. This was contrary to his other responses however which indicated that he did use the other sources of information including magazines, newsletters, web-based and other farmers. This DF believed that services provided by extension professionals (especially he mentioned GEPs) are good in theory but not practice. It was observed that he still gets information from other farmers, mass media and internet. This shows extension has made the access of farmer easy to information through mass media, other farmers and web.

Finally, participants were also requested to provide some additional comments and suggestions at the end of interview. Two related comments are quoted below.

There is a lot of information around the world and dairy farmers can easily excess it, but the important thing is to bring it into practice. (RFN)

Extension is very important for the farmers and they should embrace this. They need to get as much information as they can and at the end of the day it is their money, so they need to be careful in the way they spend their money. (JFV)

The response from RFN appears to reflect that farmers need to do proper research for getting information locally or internationally. There is no doubt that web base extension can provide easy access to the useful information nationally or across the world. Within this situation the responsibilities of farmers would be to select appropriate information on the web followed by its on-farm utilization. From the current study, it appears that farmers' believe that the key of success for dairy farmers is to bring theory into practice, yet they need effective and selective use of information.

From the current study it appears that the match of perceptions and services of DFs and EPs can be achieved through GEPs provision of effective group extension creating a good for learning and networking environment for farmers. It was apparent that PEPs mostly provide specific one to one extension, which is more practical and effective for problem solving. The other two extension strategies (mass media and web base) are noted as being used as supportive strategies. Web base extension appears to gaining popularity with DFs with the acknowledgement of the inclusion of new 'smart' technologies in the DFs responses. The mismatches found were that some GEPs are perceived as providing only general and project base extension, while some PEPs provide commodity base extension. These perceptions were noted as being perceived as problematic for DFs and could be considered in the development of future strategies for the delivery of effective extension in dairy for NSW and Victoria.

4.2.2.Rationale for Action:

This theme explains the perceptions of farmers about extension strategies, what they think are good or bad and why. In this way the rationale for the actions of the farmers in relation the extension strategies they are involved in has been investigated. The rationale for action of farmers' perceived good aspects of the strategies used (fig.4.3) were opportunity for practical experience (to see theory in practice), financial return on investment, change in production, and networking of dairy farmers.

Two DFs indicated that the opportunity for practical experience as a positive side of the extension strategies in-use. These 2 DFs added that group and one to one extension strategies helped farmers to convert theory into practice. This perception was also discussed in relation to the Information Sources theme and was supported by the feedback from EPs noted in the previous chapter. These 2 DFs also added that group extension activities, like field days, farm walks, and farm groups are very helpful for farmers' learning, as they noted that farmers do learn well from other farmers. This interactive learning was also described as strength of group extension by EPs in the previous chapter. Thus the rationale for farmers being involved in group extension was the learning environment provided within farmers to farmers interactions.

It was observed from the study that for farmers who want to see how the information provided by extension professionals (theory) work in practice, the group and one to one extension strategies is of interest. Alternatively, farmers who are constantly looking for new ideas and applications are using web-based and mass media extension strategies. However the findings from this study show that the later two strategies are mostly used for exploring or researching what is happening in other areas, states or countries. Farmers also use the later two strategies for updating the information obtained from EPs.

Two DFs indicated they get good financial return on investment from dairy farms and added that the four extension strategies have been helping farmers in improving socio-economic conditions by improving farm productivity and profitability. The improvements in socio-economic conditions were considered as the profitability of farms resulting in better life standards of farmers. The two farmers added that they have observed positive improvement in their farm profitability and productivity and improvement in the socio-economic conditions were directly associated with the benefit

gained extension activities like, field days, farmers discussion groups, farm walks and informal trainings.

One of the two DFs considered that there was a positive change in his farm production as a result of the proper use of information provided by EPs. He recommended that farmers should make the maximum use of information they received. He added the making appropriate use of available information is a skill and farmers need to use this skill in order to get improved production. One DF considered network created through extension services as important, and added that this helps farmers in problem solving as well as in relationship building. He added that through these networks farmers can get access to valuable advice and recommendations based on years of experiences. It was stated that;

I have learnt different and new practices from other farmers and from extension professionals (RFN).

The same finding was observed in the earlier theme ‘sources of information’ by three other DFs, which were mentioned again by one of them as a good rationale of the extension strategies.

The rationale for action of farmers’ perceived bad aspects of the strategies in-use (fig.4.3) were; timing issues, lack of trust of information, theory not backed by practical application and lack of interest of some farmers in extension activities.

One DF indicated that timings of some extension events were often inconvenient, resulted in farmers missing important information. He further explained that the farmers may be busy on their farm work or they may sometimes not prioritised extension events and this result in low attendance. This low attendance issue was also mentioned in the previous chapter by one of the EPs as a weakness of the group extension. Therefore, this reflects that the farmers being busy and lack of interest of some farmers resulting low attendance in the group activities. This also shows the importance of need base provision of extension strategies for farmers; reflected in the following response.

The bad side is sometime not enough farmers come to such events like field days and discussion groups, though there are a lot of farmers around. (TFN)

This highlights low attendance of farmers as a problem, because it results in less opportunity for idea and information exchange interaction at field days. This results in

lower attendance of farmers in extension events, and farmers being deprived from important information.

One DF indicated lack of trust and was concerned about the reliability of facts and figures presented at field days and group discussions by other farmers. He added that sometime farmers conceal what went wrong on their farm and only mention the good things. He added that the facts and figures often appear exaggerated. He believed that farmers want to know all the dimensions of the on farm activities and as a farmer we are supposed to share our experiences (good and bad), so that farmers may learn from each other's mistakes. However, this concern was not mentioned by any other DF or EP elsewhere. In addition it was observed that in case studies A, EPs always select the best host farmers for extension activities as a role model.

Bad about these are you will get some people along who are sort of concealing the facts from you; they will never tell you the fact about what went wrong for them. They will just tell you the good things not the bad. (MFN)

Two DFs believed that sometimes theory is not backed by practical application, especially the information in magazines and newsletters. One farmer indicated that on reading articles in some magazine or newsletters there was no apparent application of the information to the field. He also added that often information is very scientific, which need to be broken down to take home messages in 'farmers' language'. Interestingly, it was noted that EPs indicated that some research articles and magazine are too technical for farmers, but the key messages are also delivered to farmers in extension activities and provided to them in more palatable form, i.e. 'tech sheets/fact sheets'. This indicates that extension activities and the information in magazines, newsletters, articles and fact sheets, can provide practical knowledge in a form that will be easy for the farmers to understand. Another DF mentioned that the extension activities are of no help for him. Interestingly this farmer was not happy with any EPs and considered extension events as waste of time.

Finally, two DFs indicated that lack of interest of farmers in some of the extension activities results in low attendance and non-active participation. The lack of interest in extension has been observed in the study as; some farmers think that they already have the information; some believe that it is not related to their practices; some may be over-shadowed by other farmers or some may simply not interested. The over-shadowed, and over-representation of farmers with greater wealth and larger properties is common in countries like Pakistan and has been found as the ‘main limitation of group extension’ (Kerby *et al*, 1996). However, effective extension delivery could possibly solve the limitation. In the current study, this lack of interest of farmers in extension activities was also mentioned by one EP as main weakness of group extension.

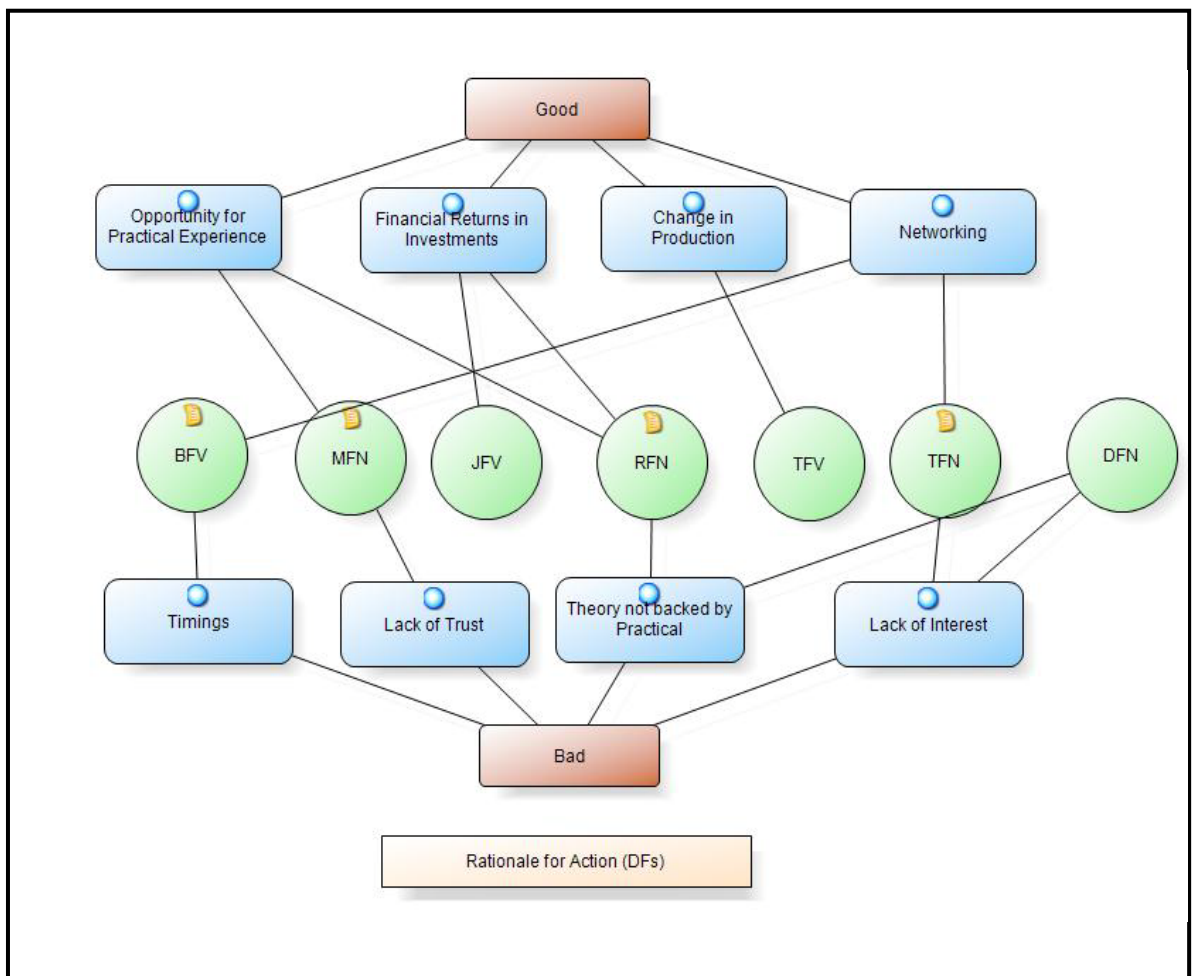


Figure 4.3: Model representing the responses of the participants (DFs) for the rationale of action, based on good and bad perceptions regarding extension strategies in-use.

In short the rationale for farmers being involved in group extension was the learning environment provided within farmers to farmers interactions. This interaction provides opportunity for networking among farmers and extension providers. The improvements in productivity of farms were the result of effective extension strategies. However, the farmers being busy and lack of interest in some repeated extension activities are resulting low attendance in field days and discussion groups. It was observed from two DFs responses that information presented in various magazines, newsletters and tech sheets are not practical, interestingly the EPs added to this concern that for using some of the technical information farmers do need to use their networks.

4.2.3.Outcomes of the Strategies used

This theme represents the DFs perceptions of the outcomes achieved by the extension strategies currently available. The responses of six DFs (fig.4.4) showed that they are engaged in almost all the four extension strategies and identified five main outcomes for the extension strategies. However, one DF indicated that these strategies are having no outcomes and only providing theory not demonstrated practice. This DF added that there was no practical help provided to him, and he has been doing everything by himself. He indicated that the primary objective for him was improving farm productivity for which he obtained information from other farmers, magazines, newspapers and some field days.

Four of the seven DFs indicated that group extension strategy was widely used and achieved useful outcomes. They added that field days, group discussions, and farm walks were the main approaches of this strategy, which they considered as good learning approaches. The details of these approaches were discussed in detail in earlier themes. Two of the DFs indicated ‘learning and practice change’ as a desired outcome of the strategies used, and which could be achieved by ‘information transfer’. The ‘information transfer’ was considered able to be achieved through the strategies of mass media, magazines, newspapers, web extension and electronic media. They added that their learning, regarding new technologies, had improved while using these resources, specifically through web base extension. These DFs indicated that they believed that attending extension events, like field days, group discussions and workshops, provided a platform ‘to see theory in practice’ and then opportunity to adopt it according to the specific required need. One participant mentioned that he believed the extension events

provide opportunities for the DFs to share experiences and gain feedback from other farmers as well as EPs. Another participant also mentioned the idea that one outcome of the extension strategies used was to give confidence to farmers and help to improve decision making in dairy farm management.

Five of the DFs (two in particular) believed that the main outcome of the four extension strategies used was improved productivity and profitability, achieved by changing farm practices according to the new technologies available, while reducing input costs. Innovation in communication technologies, especially the introduction of internet-based technologies, was considered to be very helpful by four of the DFs, in terms of communication and information transfer. The participants indicated that they thought that most of the farmers now use email groups and web resources for getting updated information from each other, as well as from EPs. They added that, while using web-based extension, DFs like to share their experiences, seek advice or help, including feedback or comments from other farmers and extension professionals. It was also indicated that web-based technologies have considerable potential to improve communications and knowledge sharing between DFs as well as EPs in different geographic locations. There was an indication that this may provide a platform for information flow between farmers, and consequently farmers would be better connected and aware of what is happening on the other farms, markets and in the industry. The same findings were also observed from EPs, while they added the linkages of farmers with extension people and other stakeholders as important outcome of web base extension.

Some of the responses of the participants regarding outcomes of the extension strategies were:

I personally like field days, farm walks, and discussion groups but continuously on different farms. It is helpful in terms of finding out what things are the best and what we are doing wrong. (MFN)

These strategies help us in our decision making and then also help us in day to day management. (RFN)

I like to do different things and as I said practical is the best thing. So I always listen to theory and they start thinking that how it will make sense in practice. I listen to everyone ideas and then try it on my farm if it makes sense to me. (TFV)

It was observed from the study that the four extension strategies are effective and have good outcomes for DFs. The three shared desired outcomes for all the participants (EPs & DFs) were; productivity and profitability, confidence building and decision making, and learning and practice change. Both the case studies reflected that the shared desired outcomes were achieved by the effective use of extension strategies in terms of information transfer, capacity building and participatory learning. The perceptions of the participants were slightly different, as the EPs (Chapter-3) indicated that they want to see the outcomes of the strategies used as applicable and practical for the DFs. On the other hand DFs want to ensure that experience-sharing, along with feedback and information transfer, as important outcomes of using these strategies. It appears that regular two way communication among DFs and EPs is missing which is necessary and could help in experience sharing, feedback and new knowledge.

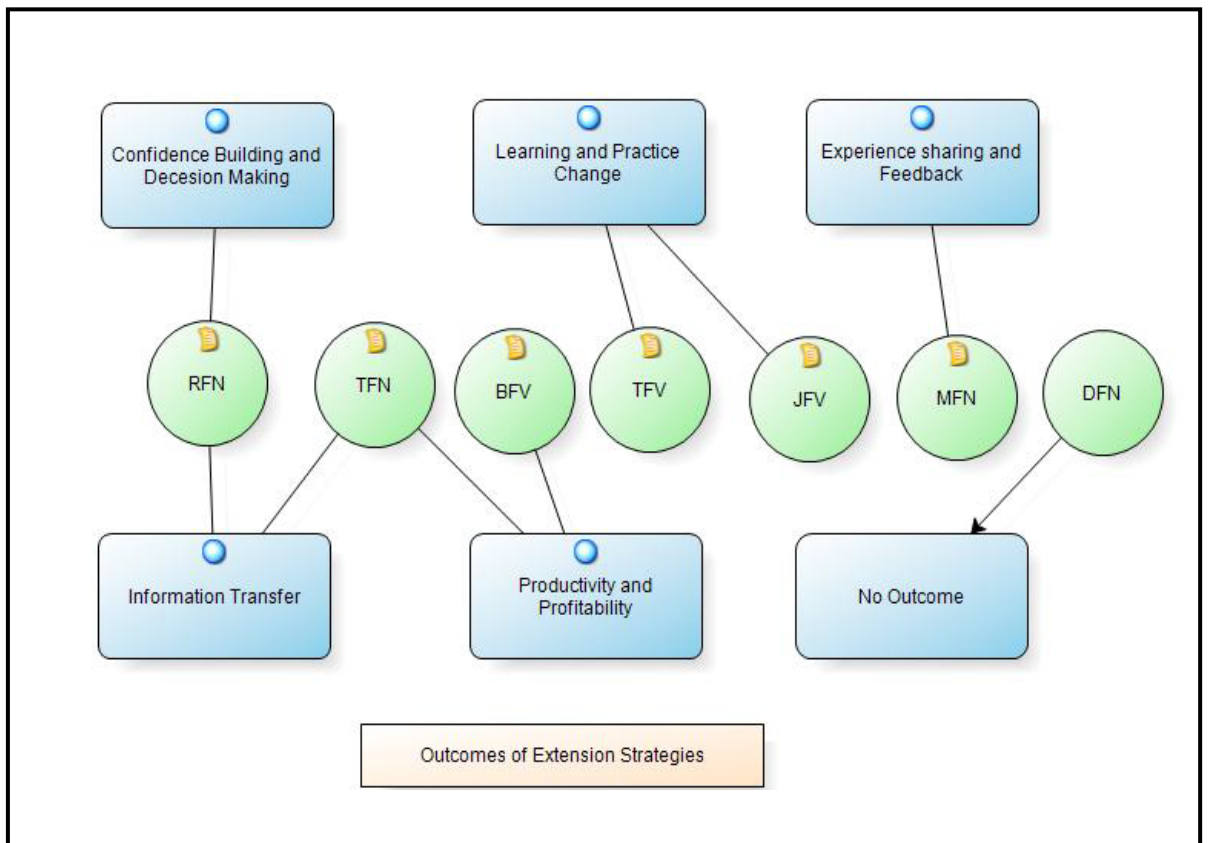


Figure 4.4: Model representing the perceptions of the participants for outcomes of the extension strategies used. Each circle represents a DF, while the rectangle is the sub-theme.

4.2.4.Evolution/Changes in the Extension Strategies

This theme represents the perceptions of the DFs on what has changed in the extension strategies and how extension strategies have changed dairy farms over the past 10 to 15 years. These changes were grouped into changes to dairy farms due to extension strategies and changes in the extension strategies over time (fig.4.5).

Four of the DFs indicated that changes on the farms due to extension strategies were the incremental changes in productivity, and financial and management improvement. These 4 DFs indicated that their farm productivity has been improved but it is hard to measure. One DF considered the change in his farm productivity to be almost 50 percent improved in the last decade. However one DF highlighted the hidden gradual change in productivity, which can count a lot after few years.

I think there are always change in productivity but sometime you don't count. Like if you have a change of 1 or 2 percent per year, you don't count it but after ten years it does count a lot. So there is a continuous change even in these strategies with time. (TFV)

One DF considered proper management resulting in changes in farm productivity. The proper management was considered to be the outcome of extension education. He indicated that initially his farm was not properly managed and experienced losses, but since having started to manage the farm properly, especially grazing management, there was a 'five-fold' improvement in farm productivity. He also added that every section of farms needs proper management in order to get productivity gains. One DF also indicated improved health of herd as significant in improving productivity.

The perceived changes in the extension strategies by time were further grouped into three sub-themes (fig.4.5). Three DFs indicated that extension strategies in the last 10 to 15 years have changed slightly and improved. They added that there is always a gradual positive change in extension strategies and good thing is that EPs take the feedback of farmers and incorporate it in future. The 3 DFs further added that discussion groups, field days, trainings, information and technology transfer are gradually improving and most importantly farmers are getting information on their farms.

Two DFs perceived that compared to the past, extension activities are now farmer friendly, participatory and practical. They indicated that there is improved two way communication between farmers and extension professionals and the extension events are not that scientific as previously. Interestingly, same comments were also observed in

the case study A, where EPs indicated that they were trying their level best to provide the best services to farmers within the resources they have. One DF believed that one of the best changes in extension strategies over time has been improving the simplicity of information provided to farmers, which makes the information more interesting and farmer friendly.

*There are changes, like in some of the very first field days we attended were very research orientated, like they were pulling out facts and figures and more kind of scientific forms, which were a bit hard to follow. These days are in much simple and easier way to follow, all the points are still there, I would rather say now these events are more farmers friendly and more participatory, so more farmers have started to come to such events/field days as they find it easier to understand.
(TFN)*

The response reflects a brief description of the perceived changes in the extension activities in the last decade. This perception is also in direct contrast to the point mentioned by a DF about farmers' not attending field days and this reducing the value by lowering the potential for information exchange. This is worth commenting as other farmers' responses indicate that the current extension services provided by EPs are effective due to the participatory approach promoted, giving farmers more control over the information presented than they have had in the past. This "Demand-Pull" extension approach has almost taken over the "Science-Push" approach under the new extension models. The current extension is mostly demand based with adult learning participatory principles (RIRDC, 1999).

Finally, two DFs indicated that there is no change in the extension strategies. One indicated that there is no change. *"Everything is the same, just change is in topics"*. However, he added that although the process are the same, like field days, discussion groups, and farm walk etc, and the good thing is there is always a new topic. This participant considered changes in topics as an important and useful strategy, which reflects the "demand-pull" extension approach. The other DF indicated that there is no change because the adopted extension strategies by the EPs are not practical.

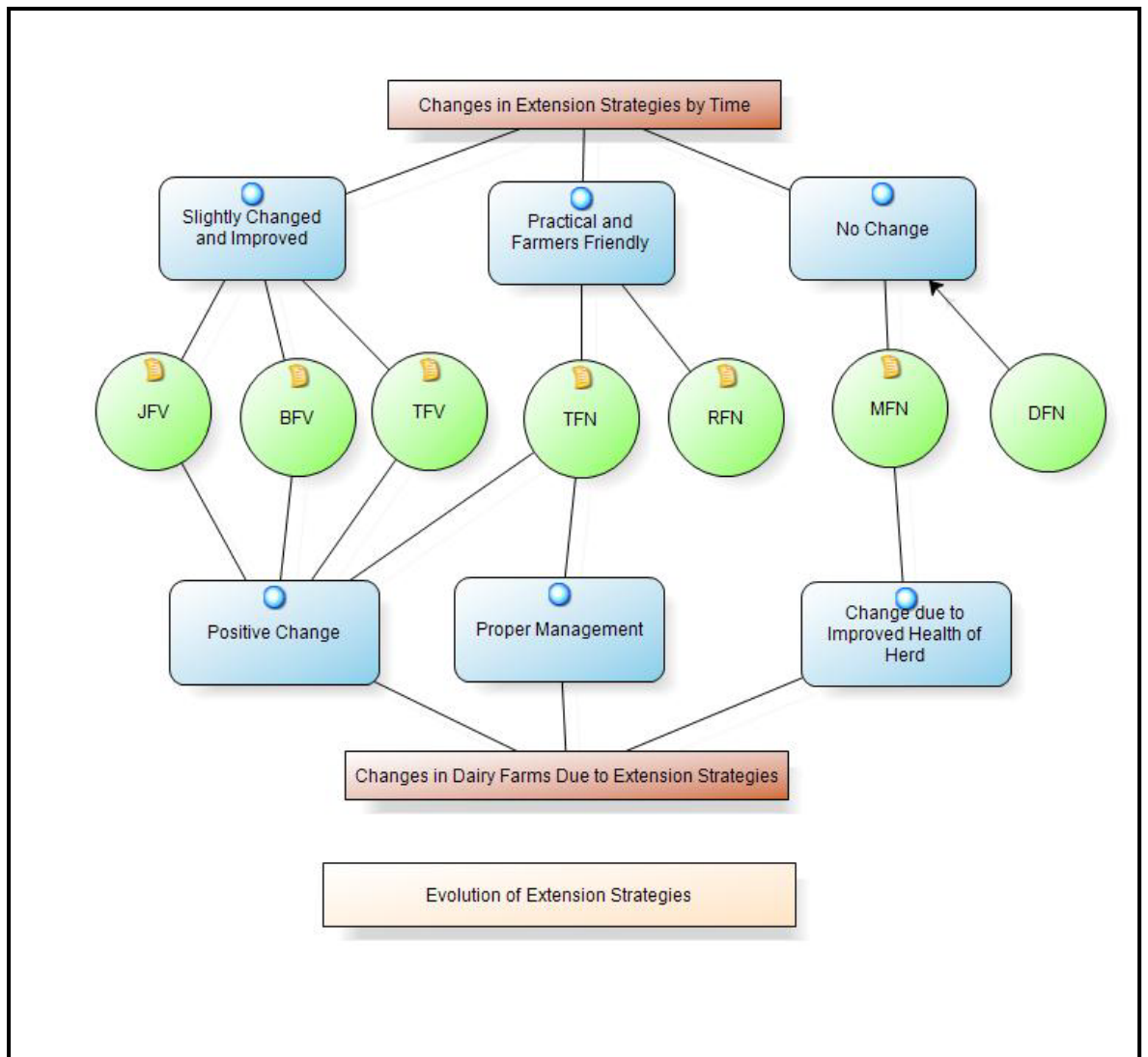


Figure 4.5: Model representing the perceptions of the participants regarding evolution of extension strategies in the last 10 to 15 years. This evolution was grouped into changes in dairy farms due to extension and changes in the extension strategies by time, further sub-grouped into three as far the responses of the participants (DFs).

4.3. Advice to other Farmers

At the end of every interview the farmers were asked to provide their valuable advice based on their experiences to other fellow farmers. Participants believed that the information obtained from the EPs was very useful; however, farmers need to bring it to practice according to their needs and available resources, and then it can result in increased profitability and productivity. Three DFs suggested farmers should try different things and reduce inputs by avoiding unnecessary spending on their farms. One DF suggested that, farmers need to 'fine tune' the available information and utilize it according to the need. Some of the valuable advices by the participants to other fellow farmers are as follow.

I always tell other farmers and will suggest that all the information we get are very useful, so we must use it then it can make difference in the production. Adoption is the key to success. (TFN)

The biggest return on productivity for us is the reasonable and simple changes we make on farm. (BFV)

These responses reflect the usefulness of the information provided by extension professionals and other sources. It was observed that there is always a message for adoption in the extension services, if the farmers' make use of those messages then changes in productivity will surely occur.

Give your time and try things differently, if things don't work then modify it. There will be things working on my place but not on others and there will be things working on other places but not on mine. We just need to modify things before using or adopting it. (MFN)

Spend as much time in learning as you can and take more steps towards implementing them. (BFV)

The first response reflects the suggestion of the DF, highlighting an important issue of adoption of new information by trying new things. In the second response the importance of implementation of what farmers learn in the extension strategies is highlighted. This concept has been observed throughout the two case studies and is termed as 'Bringing theory in practice'.

4.4.Summary:

Seven interviews were undertaken and analysed in this case study B with the aim of finding out the effectiveness of extension strategies used, by the perceptions of the DFs. The study found that the main extension strategies used by the DFs in the two States in Australia were; group, one to one, mass media and web-based extension. It was observed that group extension is mostly used across the two states, as it provide a platform for the DFs to see things practically on other farms and learn from other fellow farmers. For direct solution to farmers' problems, one to one extension was found to be the most effective extension strategy. However, the need for 'multiple methods' approach was also pointed out by 5 out of 7 DFs, who indicated for group extension to be followed up by one to one extension. Mass media and web-based extension were mostly found to be used for networking, experience sharing, informal education, awareness rising, and feedback. Mass media was also found as a good supportive extension strategy. The importance of web based extension was highlighted as an emerging effective strategy and having good future. It has been observed that web base technologies can enhance farmers' learning and change the traditional farming to the IT based farming. The web based technology can also help solving the concern of farmers' 'youth not taking interest in farming' by attracting them to farming. Most importantly, web based technologies seems to have possible IT impact on the farmer to farmer and farmer to EPs networking.

The perceptions of DFs reflected the effective use of the extension strategies. It was observed that the DFs received information mostly from private extension providers followed by government extension providers. The trend of public-private partnerships in the dairy extension across Australia has also been observed.

The rationale for the actions of the farmers in relation the extension strategies they are involved in has been investigated. It was found that the extension services resulted in improved productivity and profitability of farms and provides opportunity for networking among DFs, EPs and other stakeholders. However, the issue of appropriate timing of extension activities and lack of interest of some farmers require possible solution. The weaknesses of the extension strategies used were; lack of trust between some farmers and theory not back by practical, especially in mass media.

The case study further showed that the four extension strategies are effective and have good outcomes for DFs. The shared desired outcomes for all the participants (EPs &

DFs) were; productivity and profitability, confidence building and decision making, and learning and practice change. Both the case studies reflected that the shared desired outcomes were achieved by the effective use of extension strategies in terms of information transfer, capacity building and participatory learning. The perceptions of the participants were slightly different, as the EPs (Chapter-3) indicated that they want to see the outcomes of the strategies used as applicable and practical for the DFs. On the other hand DFs want to ensure that experience-sharing, along with feedback and information transfer, as important outcomes of using these strategies. It appears that regular two way communication among DFs and EPs is missing which is necessary and could help in experience sharing, feedback and new knowledge.

The theme 'evolution of extension strategies' represented the perceptions of the participants for changes in the extension strategies in the past 10 to 15 years. The changes in extension strategies by time were found to be; practical and farmers friendly and slightly change with some improvements. However, some DFs also described that there is no change in the extension strategies. The changes in dairy farms practices due to extension strategies used were found to be; proper management, improved herd health, and other positive changes. Also the participants provided their valuable advice to other farmers for effective use of extension strategies.

Finally, the case study investigated the effectiveness of the current extension strategies employed by the extension professionals (government and private), and dairy farmers' perceptions regarding the effective use of these strategies. The findings shows that all the four extension strategies can be utilised in Pakistan dairy industry but the most effective based on literature reviewed will be group extension followed by web based extension.

4.5.Limitation of the Study:

The study has a number of limitations:

- Conducting interviews was difficult as most of the extension professionals and dairy farmers were busy. Although the number of interviews conducted was sufficient to provide worthwhile results, it would have been ideal to have conducted more interviews.
- The time available for the research was limited and was also affected by the natural calamity like floods in Australia, resulting in a delay in data collection.
- The eighteen interviews studied from extension professionals and seven interviews from dairy farmers across NSW and Victoria does not reflect the complete Australian dairy industry, but the studies of these cases do provide the insights into the industry.
- There was lack of local dairy extension literature for Pakistan, so general agricultural extension literature relating to Pakistan has been used for this study. This also notably shows that there is a need to fill this gap and conduct further research into the Pakistani dairy sector.
- In near future, PDDC will further develop and refine their dairy extension strategies across Pakistan. The findings and recommendation of this study will possibly help our PDDC extension team, and will be shared with other partner (public and private) organizations. However, other government policy makers may not adopt the extension strategies based on this single study at the initial stage, unless they see the implications.

CHAPTER 5: SUMMARY AND APPLICATION TO PAKISTAN

5.1. Introduction

This study has highlighted the perceptions of NSW and Victorian extension professionals and dairy farmers regarding the effectiveness of extension strategies used in Australia. The general findings from this study show that dairy extension in Australia is mainly focused on capacity building and community engagement. The desire for new and improved information by farmers and early adoption of new technologies has been one of the important recent changes associated with the dairy extension. A recent positive change in the dairy industry reflects that state governments are welcoming public-private partnerships. The current strong public and private partnerships with a defined role in service provision and development of regional networks are playing key roles in Australian dairy industry. However, extension officers now often act as facilitators rather than as experts in science or technology. The findings from this study provide a foundation for making effective use of the four extension strategies in Pakistan. The lessons learned from the Australian extension strategies shows that group extension followed by web-based extension has possible application to the medium sized dairy farmers in Pakistan. In addition, the development and maintenance of public-private extension partnerships in Pakistan will be necessary for effective extension delivery.

5.2. Lesson Learned

The study found that group extension is growing rapidly and has wide application and acceptance in Australian dairy industry. However, to use group extension effectively, it needs to be ‘topped up’ by one-to-one extension in order to facilitate the on-farm learning processes of individual farmers. Such an approach helps farmers to be prepared to face future challenges, able to plan and to introduce technologies in a specific manner on their farms. The findings showed that dairy farmers mostly received group extension from government extension providers, and one-to-one extension from private extension providers. The use of a ‘multiple approach’ was also observed, and was considered to be

effective with a rapid growth in the use of web-based extension, and mass media still used for information transfer.

Strong linkages among extension providers and dairy farmers were found to be necessary for effective extension delivery; as extension professionals are the ‘change agents’ in the whole process. It was found that extension professionals have had a significant role in improved milk production, farmers’ adaptation to climate change, correct calf management, improved animal health and introduction of modern dairy sheds. In addition, extension professionals are providing the best services within their capacity and available resources.

The major mismatches found among the perceptions of extension professionals and dairy farmers were; some government extension professionals are perceived as providing only general and project-based extension, while some private extension professionals provide commodity-based extension. In addition, a lack of trust among some farmers, and their perception that theory is not backed up by practical support, especially in mass media communications, were other mismatches highlighted by dairy farmers. It was apparent from this study that private extension professionals were the ones mostly providing specific one-to-one extension and therefore involved in specific practical problem solving. While in Australia, group extension is mostly funded by state government, and one-to-one extension is almost privately funded, the networking and coordination among extension professionals working in the two sectors has improved.

It was notable that web-based extension appears to be gaining in popularity, with the acknowledgement of the inclusion of new ‘smart’ technologies. Farmer use of web-based technology has been increasing during the last decade, with 66 percent of Australian farms reported to be using the internet for business operations (ABS, 2008). This positive trend suggests that most farmers will start using web-based extension in future.

This study has shown that the four extension strategies predominantly used in Australia are effective, providing good outcomes for dairy farmers. The shared, desired outcomes for all the participants (EPs & DFs) were; productivity and profitability, confidence building and decision making, and learning and practice change, and progress seems to be perceived as positive by both extension providers and recipients. Some differences in

perceptions of extension professionals and dairy farmers for the outcomes of the extension strategies used showed that extension professionals want to see the outcomes of the strategies used as applicable and practical for the dairy farmers. On the other hand dairy farmers want to ensure that experience-sharing, along with feedback and information transfer, as important outcomes of using these strategies. It appears that regular two-way communication among dairy farmers and extension professionals are missing, which is necessary and could help in experience sharing, feedback and uptake of new technologies.

5.3. Application of Findings to Medium-Sized Dairy Farmers in Pakistan

Recently in Pakistan, various action plans have been adopted in order to develop systems to provide profitability for small dairy producers and maintain quality through the supply chain, while assisting the development of large scale commercial farms. This concept was initially introduced by Pakistan Dairy Development Company and called as “Two-Tiered Action Plan” (PDDC, 2006). In this concept, the needs of medium-sized dairy farmers, who are the main suppliers to the big cities, were somewhat neglected (PDDC, 2006).

The results of the present study suggest that there is potential to make use of any of the 4 identified extension strategies, particularly group and web-based extension, and that these could have a significant impact if the associated technologies and human resources could be supported through the Pakistan Dairy Development Company. Therefore, the findings of this study have implications for institutions charged with training dairy extension professionals in Pakistan who work with dairy farmers, specifically medium-sized dairy farms. From the present study, it has been observed that public-private partnership is necessary for effective extension delivery; however, the initial review indicated that in Pakistan the public-private partnership is very loose. It seems that the public and private sectors will need to work more closely in order to achieve effective extension delivery into the future. Such linkages will further create opportunities for network building with other stakeholders, while using the resources efficiently and targeting large number of farmers effectively.

The findings of this study indicate that change in the dairy industry can be effected from an extension professional point of view through working with the farmers, assisting them to bring theory into practice, as well as by adopting group and adult learning principles, and engaging farmers by using case studies from developed dairy industries. From the dairy farmers' perspective, there is a need to change their traditional views and practices, and take steps towards improved sustainability and food security.

Profitability and productivity of milk production will not increase unless the dairy farmers in Pakistan adopt innovations and mechanization. Government and non-governmental organizations (NGOs) need to encourage investment in the dairy sector if it is to reach its potential as a food provider for the Pakistani nation. In addition, reductions in duplication and increased infiltration of dairy programs or projects across the country must also be considered in order to utilize the limited available funds and resources properly and effectively.

As observed from this Australian study, most group extension is state government-funded while one-on-one extension is mostly privately funded. In Pakistan, extension provision is under a similar model, but lacks coordination between the two sectors. Most of the extension programs are duplicated, and both sectors are mostly using their funds and resources for similar goals. The government sector provides group extension and various NGOs, projects, programs, national and multi-national companies provide both group and one-to-one extension. In Pakistan, the public-private partnership can progress if the public sector focuses more on group extension and the private sector focuses on providing additional group and one-to-one extension. The public-private partnership and coordination will help dairy farmers in improving productivity and profitability, adoption of new technologies, and to face future challenges. However, the public and private sector gains will be; improved coordination, saving time and resources, achieving goals and targets, and resulting happy farmers.

Networking of extension professionals, dairy farmers and other stakeholders is also important for effective extension services. It is anticipated that the participant-led, group based approaches are the most likely to contribute to the capacity building of the dairy farmers, as these will be the most cost-effective. There is also a potential for utilization of web-based technologies in Pakistan for farmer communication. In Pakistan, the phone and internet coverage is very vast and according to Telecommunication Regulatory

Environment (TRE) survey report of Pakistan telecom; *“In 2008 Pakistan was the world’s third fastest growing telecommunications market. Pakistan’s telecom infrastructure is improving dramatically with foreign and domestic investments into fixed-line and mobile networks; fibre systems are being constructed throughout the country to aid in network growth”* (Wilson, 2009). In addition, the recent statistics of Pakistan Telecommunication Authority (PTA) shows that approximately 90 percent of Pakistanis live within areas that have cell phone coverage, and more than half of all Pakistanis have access to a cell phone, with 108 million mobile subscribers in April 2011; Pakistan has the highest mobile penetration rate in the South Asian region (PTA, 2011). The majority of extension professionals and farmers are using mobile phones, and the extension professionals’ use the internet for information transfer and social networking; however, the use of internet for effective use of extension among farmers is not common. The farmers still need to be engaged with internet use for farmer networking and information transfer.

The current projected population growth in Pakistan highlights the need for dairy extension services to sustain development and meet perceived needs. Dairy extension services are very important for achieving productivity outcomes and the dairy farmer needs to be more willing to adopt new practices and technologies in order to face the challenges of the increased demand. This study has found that the technological and managerial changes in the Australian dairy industry were mostly the consequence of the “shift” to the larger farms. In Pakistan this is also likely in the near future and as ‘the shift’ to larger farm takes place and the medium dairy farmers will be the first to involve. To meet the need of future of the medium dairy farmers in Pakistan, extension professionals need to provide the “demand pull” extension services through participatory group base extension, this could possibly targeted by:

- Identifying need based trainings.
- Facilitation of dairy farmers in various on-farm activities.
- Linkages development with other organizations and dairy farmers.
- Rural network formation and development.
- Better access to veterinary care services.
- Milk marketing and processing.
- Providing path ways to ‘shift’ by increasing farm size and number of animals.

- Access to easy finance.
- Increase productivity and profitability of dairy farms.

In addition effective dairy extension could also help the industry in achieving the goal of a “white revolution” and ensuring food security. Pakistan is ranked 3rd in milk production in the world but the numbers of extension professionals in dairy extension are limited. There is also a need to increase the number of extension providers for effective extension delivery. The recent investment in the dairy sector in Pakistan needs further expansion in provision of extension services. The study of the Australian dairy industry has focused on participatory learning, networking among farmers, extension professionals and stake holders and expanding extension services in the dairying regions. The recommended application of the outcomes of this study will possibly help in strengthening the industry in the following ways.

- Helping the overall increase in milk production and quality.
- Help better networking of dairy farmers.
- More contribution to GDP.
- Help in meeting the needs of urban areas.
- Better and organised extension networks.
- Boost to rural development.
- More jobs.

Addressing these issues will help in supporting the medium size dairy farmers and should result in helping to overcome food security issues.

Finally, it has been observed from the two case studies in this thesis that one-to-one extension is the most effective way of information transfer, but it is expensive. Can web based extension fill in this gap in future? This question is still to be answered. , network analysis of farmers in order to use web-based technologies for extension needs may play a major role in future dairy extension Farmers’ community networks could also provide a new vision to the community farming in Pakistan and Australia.

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Appendix A:

Semi-Structured Interview Questions for Extension Professionals:

Background and Context:

1. Could you please describe your role within your organization and how long you have been fulfilling the role?
2. Could you please describe in general terms how your organization functions in relation to its extension and education activities?
3. Has this function changed over the last 10-15 years? If yes, how has it changed?
4. What do you believe if there is any contraction or expansion in extension services in both states?

Extension Strategies:

5. What are the primary extension strategies you use, and how do you employ them?

For each extension strategy mentioned:

6. What do you believe are the outcomes of the extension strategy?
7. Has this strategy changed over time? If so, how has it changed, and why has it changed?
8. What do you believe are the strengths or weaknesses of this strategy?
9. Have you formally evaluated the effectiveness of this strategy? If so, what were the outcomes of this evaluation? Has this evaluation been documented, and if so, is this document available?
10. Generally speaking, what criteria would you use to evaluate the effectiveness of this strategy?
11. What do you believe is the future for this strategy in your organization?
12. What advice would you give to other extension professionals about using this strategy effectively?
13. What, if any, are alternative strategies not currently used by your organization which you think could be useful? What benefits might these strategies offer?
14. , what are the similarities and differences of public and private extension?

15. Can you think of a particularly effective dairy extension program with which you have been involved?

- What was the name of the program, and what was it attempting to achieve?
- Why do you judge it as successful, and what did it achieve?
- What happened in this extension program to make it successful?

Technological and Management Change in the Dairy Industry:

16. What do you believe have been the most significant technological and management changes in the dairy industry over the last 10-15 years?

17. What do you believe have been the catalysts or drivers (internal and external to the industry) for each of these changes?

18. What role has extension and education played in initiating and facilitating these changes?

19. Finally, are there any other comments you would like to make?

Thank you for your contributions and participation.

Appendix B:

Semi-Structured Interview Questions for Farmers:

1. Can you please describe what type of farming you do and for how long you are involved in this?
2. Could you please describe generally, how and from whom, you get the updated information for improving your farm productivity?
3. What extension strategies you have engaged in so far, and what do you think are the outcomes of the strategies used?

For each extension strategy/model mentioned:

4. Can you please tell me, how does this extension strategy fit in to your enterprise?
5. For how long were you engaged in this extension strategy and why?
6. What do you think, is there any change in productivity after adopting this extension strategy?
7. What do you think is good about this strategy and what is bad about this strategy?
8. Has this extension strategy changed over time? If so, how has it changed, and why has it changed?
9. Do you believe this extension strategy will be useful in future?
10. What will you suggest to other fellow farmers about using this/these strategy/s effectively?
11. Finally, are there any other comments you would like to make?

Thank you for your contributions and participation.

Appendix C:

Consent Form for Participants

I,, have read the information contained in the Information Sheet for Participants and any questions I have asked have been answered to my satisfaction.

Yes/No

I agree to participate in this activity, realizing that I may withdraw at any time.

Yes/No

I agree that research data gathered for the study may be published using a pseudonym.

Yes/No

I agree to the interview being audiotape recorded and transcribed.

Yes/No

Signatures:

.....
.....

Participant

Date

.....
.....

Researcher

Date



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Appendix D:

INFORMATION SHEET for PARTICIPANTS

Research Project Title:

Dairy Extension Strategies in Australia: Application to The Pakistan Dairy Industry.

I wish to invite you to participate in my research on above topic. The details of the study follow, and I hope you will consider being involved. I am conducting this research project for my Postgraduate Research degree (Master of Rural Science) at the University of New England. My supervisors are Dr. Julian Prior and Dr. Geoff Hinch of University of New England. Dr. Julian Prior can be contacted by email at jprior@une.edu.au or by phone on 02 6773 3610. Dr. Geoff Hinch can be contacted by email at ghinch@une.edu.au or by phone on 02 6773 2202, and I can be contacted by email at sahmad4@une.edu.au or phone on 02 6773 5217 or 043-116-1942.

Aim of the Study:

The study will focus on examining Australian extension strategies used in dairy farming which may be suitable for medium-sized a dairy farmers in Pakistan. The research results will reveal the most applicable extension methods to be used by extension practitioners in Pakistan. This will be used to design a new and most applicable extension strategy for Pakistani dairy farmers.

Time Requirements:

Participants will be asked to take part in an interview, conducted either face to face or by phone. The interview will last approximately 40 minutes and will be audio-taped, with your permission.

Interviews:

Participation is completely voluntary. You may withdraw from the project at any time and there will be no disadvantage if you decide not to participate or withdraw at any time. If participant quotations are used, participants will be quoted anonymously, and they will not be identified in any way.

It is unlikely that this research will raise any personal or upsetting issues but if it does you may wish to contact your local Community Health Centre +61 2 9351 3484

The audiotapes will be kept in a locked filing cabinet at the researcher's office. The transcriptions will be kept in the same manner for five (5) years following thesis submission and then destroyed.

Research Process:

It is anticipated that this research will be completed by the end of September 2011. The results may also be presented at conferences or written up in journals without any identifying information.

This project has been approved by the Human Research Ethics Committee of the University of New England (Approval No: HE10/174 Valid to 24/09/2011)

Should you have any complaints concerning the manner in which this research is conducted, please contact the Research Ethics Officer at the following address:

Research Services

University of New England

Armidale, NSW 2351.

Telephone: (02) 6773 3449 Facsimile (02) 6773 3543

Email: ethics@une.edu.au

Thank you for considering this request and I look forward to further contact with you.