A new kind of extension worker: the Livestock Guru

RIU

Validated RNRRS Output.

Researchers working in India have developed Livestock Guru—a multi-media interactive learning program to teach farmers about animal health, welfare, and production. The program is available in two languages (Tamil and Oriya) and poor livestock keepers are being given access to it through kiosks with computing facilities. In Tamil Nadu and Pondicherry, these kiosks are permanently available in local village knowledge centres. In Orissa, on the other hand, they are being placed in NGO training centres and local government offices for two months before being moved on. Importantly, the program keeps a record of exactly what information users ask for. This information can then be used to make decision makers aware of the needs of the poor and to update the program.

Project Ref: **LPP25:**
Topic: **7. Spreading the Word: Knowledge Management & Dissemination**
Lead Organisation: **University of Reading, UK**
Source: **Livestock Production Programme**

Document Contents:

Description

LPP25

Research into Use
NR International
Park House
Bradbourne Lane
Aylesford
Kent
ME20 6SN
UK

Geographical regions included:

Bolivia, China, India, Kenya,

Target Audiences for this content:

Livestock farmers,

A. Description of the research output(s)

1. Working title of output or cluster of outputs. Knowledge Dissemination

Livestock Guru

2. Name of relevant RNRRS Programme(s) commissioning supporting research and also indicate other funding sources, if applicable.

Animal health

3. Provide relevant R numbers (and/or programme development/dissemination reference numbers covering supporting research) along with the institutional partners (with individual contact persons (if appropriate)) involved in the project activities.

R8213

Claire Heffernan, Livestock Development Group, School of Agriculture, Policy and Development, University of Reading
Mr Senthil Kumaran, MS Swaminathan Research Foundation, 3rd Cross Road, Tamarani Industrial Area, Chennai, India
Dr Swami Arupananda, Arupa Mission Research Foundaton, N6/23 IRC Village, Nayapalli, Bhupaneshwar, Orissa

4. Describe the RNRRS output or cluster of outputs being proposed and when was it produced?

The **Livestock Guru** project was part of a cluster of outputs for **knowledge dissemination** and delivery as part of the Animal Health Programme. The project ran from 2002-2005. The software was produced in response to the demand for poor livestock keepers for knowledge and information as detailed in Project R7659: The Delivery of Livestock Services to the Poor: A framework for analysis. The software was part of a wider project exploring the animal health priorities of the poor vs. decision-makers Project: R8213: Listening to the Voices of the Poor.

This former study explored perceptions and attitudes toward livestock services among over 3,300 farmers in three countries: Kenya, India and Bolivia. Interestingly, across the three countries and continents, the problems of poor livestock keepers were largely the same. The poor suffered from the lack of appropriate inputs and further, access to knowledge and accurate advice regarding the livestock in their care was perceived as a key constraint. As such, the research was the first to provide evidence as to the knowledge needs and hence, demands of the poor within the livestock sector.

In response, the Livestock Guru project was initiated. The Livestock Guru is a **multi-media interactive learning** program for farmers in India regarding animal health, production and welfare. Two language versions have been produced in India: Tamil and Oriya. The software is being distributed as part of the village knowledge centres in Tamil Nadu and Pondicherry. In Orissa, the software is being distributed through a local NGO.

Initial content for the programme was derived from the **priority livestock diseases** and production constraints first detailed in R7659 above. Further, the software has been designed to enable the information demands of the poor to be captured and transferred to decision-makers, further informing project R8213. In this manner, the content can be continually updated to meet the emerging information demands of the poor. Therefore, while the research produced a technology, given the design of the software, the outputs also have methodological (i.e. capturing the knowledge demands and priorities of the poor) and further policy implications (the impact of ICTs on learning).

5. What is the type of output(s) being described here?

Product	***Technology***	***Service***	***Process or Methodology***	***Policy***	***Other Please specify***
	x		*x*	*x*	

6. What is the main commodity (ies) upon which the output(s) focussed? Could this output be applied to other commodities, if so, please comment

The output is focused on livestock production and health. However, the software was designed to be able to incorporate other issues/constraints from other sectors. Thus, the format is easily adaptable to providing information on crop production and human health.

7. What production system(s) does/could the output(s) focus upon?

Semi-Arid	***High potential***	***Hillsides***	***Forest-Agriculture***	***Peri-urban***	***Land water***	***Tropical moist forest***	***Cross-cutting***
				x		*x*	*x*

At present, in India, the software is targeted across a range of poor farmers residing in peri-urban, rural and urban areas.

8. What farming system(s) does the output(s) focus upon?

Smallholder rainfed humid	***Irrigated***	***Wetland rice based***	***Smallholder rainfed highland***	***Smallholder rainfed dry/cold***	***Dualistic***	***Coastal artisanal fishing***
x	*x*					

9. How could value be added to the output or additional constraints faced by poor people addressed by clustering this output with research outputs from other sources (RNRRS and non RNRRS)?

Given the design of the software, the program can both be a primary tool for knowledge dissemination and/or augment existing strategies. The software is easily adaptable to disseminate a wide range of knowledge outputs from a variety of research forms i.e. basic to applied approaches. Equally, the tool can be utilised to identify farmer priorities across a range of issues. With regard to the actual kiosks (or mechanism for delivery) value can

be added via synergies with convergent technologies such as wireless networking, solar technologies (to increase dissemination in rural areas) and mobile phone technologies (such as diagnostic and surveillance technologies).

In relation to RNRRS, clusters of relevant outputs include those relating to participatory, decision-support tools, knowledge management and dissemination; marketing support and policy influence. Across the RNRRS portfolio of projects, potential synergies are as follows:

Crop Post-Harvest Programme: Pest Management Tools and Strategies (R6311, R6684, R7686, R8265); Market Information Tools (R7494, R8250, R8422); Farmer Access to Markets (R8275; R8274; R8498); Knowledge Management (ZB0308).

Natural Resources Systems Programme: Community-led Improved NRM (R8362), Strategies for Scaling up Processes (R6525), Scaling up through communication (R8363) and Participatory Technology Development (R7412).

Animal Health: TB/Brucellosis (R7229, R7357); Diagnostic and Decision-Support Tools (R7596, R7597), Influencing Animal Health Policy.

Livestock Production: Small Holder Dairying Toolbox (ZC0261), Talking Pictures (R7431, R7855), Draught Animal Power Toolbox (ZC0204), Practical Decision-Support Tool to Improve the Feed Management of Ruminant Work Animals (R7376, ZC0257), Smallstock Toolbox (ZC0243), Participatory Livestock Research (ZC0289), Wambui (R7425).

Validation

B. Validation of the research output(s)

10. How were the output(s) validated and who validated them?

The Livestock Guru was validated in three stages by the following partners:

Stage I: Assessing User Demand (MSSRF, Arupa Mission Research Foundation, LDG)
Stage II: User Perceptions and Learning Assessment (LDG)
Stage III: Impact/Uptake (MSSRF, Arupa Mission Research Foundation)

Core methods are as follows:

Stage I: User Demand

To ensure the content for the programme was based upon user demand, the study drew upon a baseline survey carried out with 1,330 farmers across six states in India (as part of R7659). Within the context of the study, a

range of participatory methods including focus groups and semi-structured interviews were performed. Key livestock management/husbandry issues were described by households and ranked. The specific priorities of poor households in Pondicherry, Orissa and Tamil Nadu were utilised to inform the development of the content for the Tamil and Oriya language versions of the Livestock Guru. Therefore, the software was created to accommodate the specific perceptions, attitudes and needs of the targeted user group.

Stage II: User Perceptions and Learning Assessment

a. Validating the Interface: Prior to building the programme, a range of pictorial styles were tested among a sub-group of the overall sample group above. Key informants in each of the States involved were utilised to explore the denotative and connotative meanings of specific illustrations. As such, the main object signs in each illustration were evaluated for appropriateness and meaning ranging from the style of the buildings and furniture to the dress, jewellery and hairstyle of the farmers or characters included in the scene. Characters were also tested for 'trustworthiness' and suitability. Overall, 72 households participated in the visual testing portion of the study (44 women and 28 men).
Equally, both the Tamil and Oriya language versions of the Livestock Guru utilised visual and auditory frames adopted from the local film industry. As such, the introduction to the program used an animation a popular, local film actor whose previous films included livestock-related themes.
b. Learning Assessment: A repeated measures study design was utilised to assess changes in knowledge that could be attributed to program use. As such, 844 individuals were tested both pre- and post exposure to the software. In total, 65% of the study group were women. Responses were scored utilising an adaptation of Jonassen and Grabowski's (1993) framework to assess differences in the quality and quantity of knowledge uptake. The results of this portion of the analysis were also utilised to compare learning with two alternate methods of knowledge transfer for development: learning videos and written pamphlets. Perceptions regarding the speed and duration of both the instructional and interactive content were also assessed.

Stage III: Dissemination/Impact/Uptake

After the piloting stage, further dissemination was undertaken with the help of in-country collaborators. Different strategies were used by the NGO's for disseminating the new knowledge technology. For example, in collaboration with AMRF, the Livestock Guru was launched in Orissa through an initial awareness raising and publicity campaign, in which leaflets, Dingura's (processions of singers and musicians carried out in the lanes and sub-lanes of a village), banners, and public announcements were used. In Orissa, the Livestock Guru was launched to over a 1000 farmers in a 10 day period in May, 2005.

Partner organisations also measured the impact/uptake of the software programme and user perceptions. Key methods for assessment included workshops/stakeholder meetings and individual-level interviews.

11. *Where have the output(s) been validated?*

In India, the livestock production systems impacted by the software are cross-cutting and range from tropical humid production systems with irrigation in Tamil Nadu and Pondicherry to smallholder rain-fed humid systems in Orissa. As detailed above, the study sites also ranged in relation to the levels of urbanisation and households resided in urban, peri-urban and rural areas. The kiosks have also been placed with particular attention paid to

accommodating issues of social exclusion. In accordance with the official government discourse in India, the software has been aimed at two large segments of the poor: 'scheduled castes and tribes', and 'other backward classes'. As such, the software has been placed among Dalit or 'untouchable' villages in addition to villages populated by these other groups. Conversely, in Orissa, the kiosks have been utilised among recent migrants from Tribal areas to Bhubaneshwar, the state capital. The location and numbers of the Guru validation groups are as follows:

Table 1. Validation Groups: Pre and Post-Assessment Participants (Guru Only)

NGO	District/Village	State		Total
		Orissa	**Tamil Nadu**	
LDG	Bhodhokandi, Jagannat Bihar Gopal Basthi, Kaijanga, Nayapalli, Rental Colony, Sahid Dexam, Satkabat, Sihula, Sisilo, Subani villages	82		82
	Urban Chennai		148	148
LDG/AMRF	Orissa launch (Khurda and Puri Districts)	407		407
	Bhupeneshwar Environs	35		35
LDG	Pondicherry (Mannadipet, Kalithertal Kuppam, Emballam)		172	172
Total		***672***	***172***	***844***

Current Situation

C. Current situation

12. How and by whom are the outputs currently being used?

As detailed above, in India, the outputs are being disseminated by two organisations MSSRF and AMRF. Two different dissemination strategies have been utilised by the partner organisations. In Tamil Nadu and Pondicherry, the kiosks have been placed in Village Knowledge Centres – these are stand alone centres in which community members have free access both the internet and different learning programmes. In Orissa, on the other hand, kiosks are being placed in communities for two months at a time and then moved. In Orissa, the kiosks are being placed in NGO training centres and panchyat (local government) offices.

13. Where *are the outputs currently being used?*

As detailed above, the software is being utilised by collaborators in three states in India: Pondicherry, Tamil Nadu and Orissa. Collaborators have requested further kiosks to scale-up activities across the study sites. Indeed, MSRRF has requested that the software be distributed in 30 village information centres. The software is also currently placed in centres as part of the National Virtual Academy Project for Rural Prosperity (a government initiative to connect over 600,000 villages to the internet by 2007). Conversely, in Orissa, AMRF has requested

further kiosks for milk co-operatives and schools.

Globally, the software program is also being utilised in Bolivia, with plans to scale-up activities in Kenya and China. Equally, a number of further requests for a software programme have been initiated by a variety of institutions and groups ranging from the State Government of Kwa Zulu Natal in South Africa to North-West Sci-Tech University in China to a development projects in Nigeria and Zanzibar.

14. What is the scale of current use?

In all three states, use of the kiosks was established quickly, with strong feedback from both farmers and partner organisations. At present, exposure to the software is simply limited by the number of kiosks. In India, to date, over 4,000 households have participated in the study. Usage is still spreading in both states and to help meet user demands, the kiosks are being utilised in a mobile fashion (particularly in Orissa, as mentioned above).

Table 1. The Livestock Guru: User Exposure

District/Village	Orissa	Tamil Nadu	Total
Bhupaneshwar Environs	384		384
Khurda and Puri Districts	1526		1526
Koraput	375		375
Mahidharpada	25		25
Jagatsinghpur	371		371
Total Orissa	*2381*		*2381*
Pondicherry (Mannadipet, Kalithertal Kuppam, Emballam)		491	491
Chennai		326	326
Dindigul		311	311
Thanjavur		334	334
Pudukkattai		>200	>200
National Virtual Academy (Pondicherry)		>200	>200
Total Tamil Nadu/Pondicherry		*1862*	*1862*
	2381	***1862***	***4243***

15. In your experience what programmes, platforms, policy, institutional structures exist that have assisted with the promotion and/or adoption of the output(s) proposed here and in terms of capacity strengthening what do you see as the key facts of success?

At present, the policy environment for ICTs in India is extremely positive. Thus, scaling up the software at a national level in India is feasible and currently has a high level of political goodwill.

In Tamil Nadu and Pondicherry, the project team worked with an NGO with a strong IT presence in the communities involved, while this was helpful, the experience in Orissa demonstrated that such a presence while helpful was not critical. Indeed, while the Village Knowledge Centre set-up clearly facilitates scaling-up, there was an overwhelming demand from communities without any IT exposure. Indeed, during the Orissa launch, a

number of communities came forward to request visits by the project team and requested future involvement in the programme. Thus, the demand of the poor for such technologies at the moment far exceeds the ability of the project partners to meet this demand.

At the level of the technology itself, the success of the Livestock Guru can be related to two factors. First, the high levels of visual and oral validation and the inclusion of local referents/knowledge frames has created a programme which strongly resonates with users. Second, by utilising traditional mechanisms for raising awareness (such as the Dingura's in Orissa), communities become rapidly engaged in use of the software.

Current Promotion

D. Current promotion/uptake pathways

16. Where *is promotion currently taking place?*

As indicated above, promotion of the outputs is on-going in three states in India with further requests for scaling-up by the partners involved. Additional requests have been received by the State Government of Andhra Pradesh and the National Dairy Research Institute for further up-scaling. It is estimated that a Hindi version of the Livestock Guru could reach an estimated 6,000 dairy producing households in the urban, peri-urban environs of New Delhi and Haryana.

17. What are the current barriers preventing or slowing the adoption of the output(s)?

In India, as in Bolivia and Kenya, the key barrier preventing scaling-up is funding. As detailed above, the policy environment is currently favourable and as the software is stand alone a large investment in institutional infrastructure is not required.

On the community-level, social exclusion was not a barrier to use of the software across the study set for the following reasons. First, the software was devised for a range of users including those with no or very little exposure to formal education. Nevertheless, in India, lack of education alone is not the most pressing barrier to knowledge acquisition. Indeed, caste and gender were the most critical barriers influencing the sources of information available to individuals in relation to livestock production and health. Indeed, studies have found that women in general and low-caste women in particular face major challenges in sourcing appropriate advice regarding animal health and are largely dependent on female social networks (Heffernan et al., 2006; Fuller, 2006). To accommodate this issue, the visuals of the software were created which were sensitive to caste associations and affiliations. Second, kiosks were physically located to accommodate issues of social exclusion.

18. What changes are needed to remove/reduce these barriers to adoption?

The experience of the Livestock Guru across two states in India has demonstrated that when ICTs accommodate the demands of the poor in relation to both topic and learning style, the communities themselves will ensure project sustainability. Equally, the Livestock Guru has been distributed on a cost-sharing basis with project

partners. Partners are responsible for all in-country transport, labour, training and awareness-raising and any maintenance costs. Nevertheless, to scale up the outputs, further inputs are required to engage other in-country partners and institutions.

19. What lessons have you learnt about the best ways to get the outputs used by the largest number of poor people?

Within India, the research team has found that efforts at raising awareness have a large impact on user profiles. Indeed, by utilising traditional mechanisms for advertising events at the community level, the research team found that curiosity and interest in the software increased exponentially. Further, high levels of initial awareness fostered the ability of communities to express demands and preferences in relation to the software such as kiosk placement issues and the inclusion of particular topics or learning material.

On a wider level, the LDG has identified two issues fundamental to the adoption of ICTs in Southern countries:

1. The software must be driven by the demands of the poor. As such the content must be relevant and the visuals appropriate. If these conditions are satisfied, the poor themselves will generate and sustain the demand for the software.
2. Collaborator organisations must be responsive to the demands of their clients and dedicated to poverty alleviation goals.

Impacts On Poverty

E. Impacts on poverty to date

20. Where have impact studies on poverty in relation to this output or cluster of outputs taken place?

The aim of the project was to explore the impact of ICTs on knowledge transfer. As such, the study was not designed to explicitly measure changes in poverty. Nevertheless, in recent years, the development community has acknowledged the strong link between knowledge and poverty (World Bank, 1998). The aforementioned report concluded that the new knowledge economy had the potential to lift hundreds of millions of people out of poverty (ibid). And indeed, it is likely that poverty impacts have occurred with use of the Livestock Guru software. Indeed, in India, collaborator reports suggest that the software is particularly useful in reaching women, who as noted above, are generally excluded from accessing formal sources of advice. Further, by geo-referencing report points, decision-makers are able to identify the knowledge needs and demands of particular user groups. In this manner, the software reduces farmer risk and amplifies the demands of livestock keepers to decision-makers via a new communication pathway which directly links decision-makers and the poor.

Core publications on learning impacts are as follows:

Heffernan, C. and Nielsen, L. (2006) *The Livestock Guru: Demand-led knowledge transfer for poverty alleviation.* Conference Proceedings International Conference on ICTs and Development, May 14-16, 2006, University of California, Berkeley.

Nielsen, L. and Heffernan, C. (2006). New Tools to Connect People and Places: The impact of ICTs on learning among resource poor farmers in Bolivia. *Journal of International Development* 18(6): 889-900.

Heffernan, C. and Nielsen, L. (2005). *The Livestock Guru: Transmitting demand-led information between decision-makers and the poor*. Conference Proceedings International Workshop on Improving the Well-being of Resource Poor Farmers. September 12-16th, Howick, South Africa.

21. Based on the evidence in the studies listed above, for each country detail how the poor have benefited from the application and/or adoption of the output(s):

In India, the livestock diseases prioritised by farmers, those with the greatest impact on livelihoods, were Foot and Mouth Disease and Mastitis. Therefore, the following section explores the impact of the software on learning regarding these farmer-led priorities.

Livestock Guru: Impacts on Learning

In total, 212 individuals chose learning modules on the following livestock diseases across the three forms of media: Livestock Guru, videos and pamphlets.

Table 3. Participants by Media and Disease: India

Media	FMD	Mastitis
Livestock Guru	23	31
Pamphlets	25	32
Video	49	52
Total	97	115

Participants were scored both pre and post exposure to the media. As the following table demonstrates, learning had occurred across all of the media in both disease modules.

Table 4. Mean Learning scores by Disease Module

Assessment Scores	FMD (n=97)	Mastitis (n=115)
Mean Pre-assessment score	0.13	0.16
Mean Post-assessment score	0.29	0.37

Equally, within each disease, there was a difference in learning across the different topics.

Table 5. Learning Scores disaggregated by Topic

Learning Scores by Topic	FMD (n=97)	Mastitis (n=115)
Cause	0.12	0.26

Symptoms	0.22	0.10
Treatment	0.17	0.22
Prevention	0.11	0.27

Interestingly, the greatest learning occurred with regard to symptoms of FMD. While most farmers could outline symptoms, they often described signs associated with a very advanced clinical condition. Hence, the uptake can be attributed to better recognition of the early signs of FMD disease in cattle. Conversely, individuals were more conversant with the symptoms of mastitis but less knowledgeable about causes, treatment and prevention.

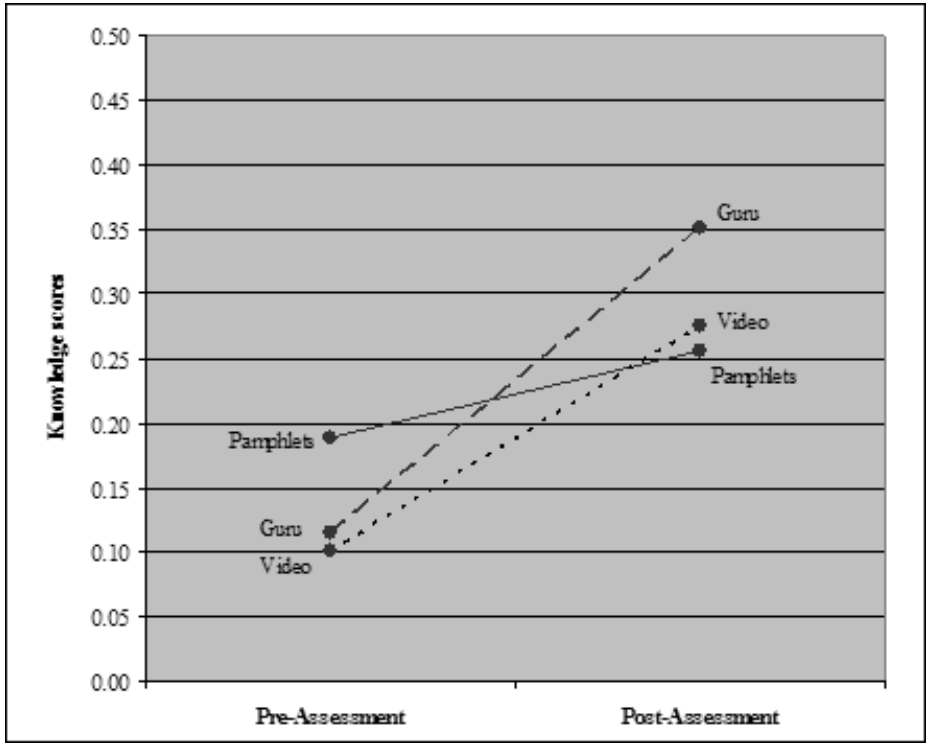
When the modules were disaggregated by media, overall, the Livestock Guru showed the greatest impact on learning outcomes across both disease modules (Table 8).

Table 6. Learning Scores disaggregated by Media

Media Groups	FMD (n=97)	Mastitis (n=115)
Guru	0.25	0.38
Pamphlets	0.05	0.13
Video	0.17	0.16

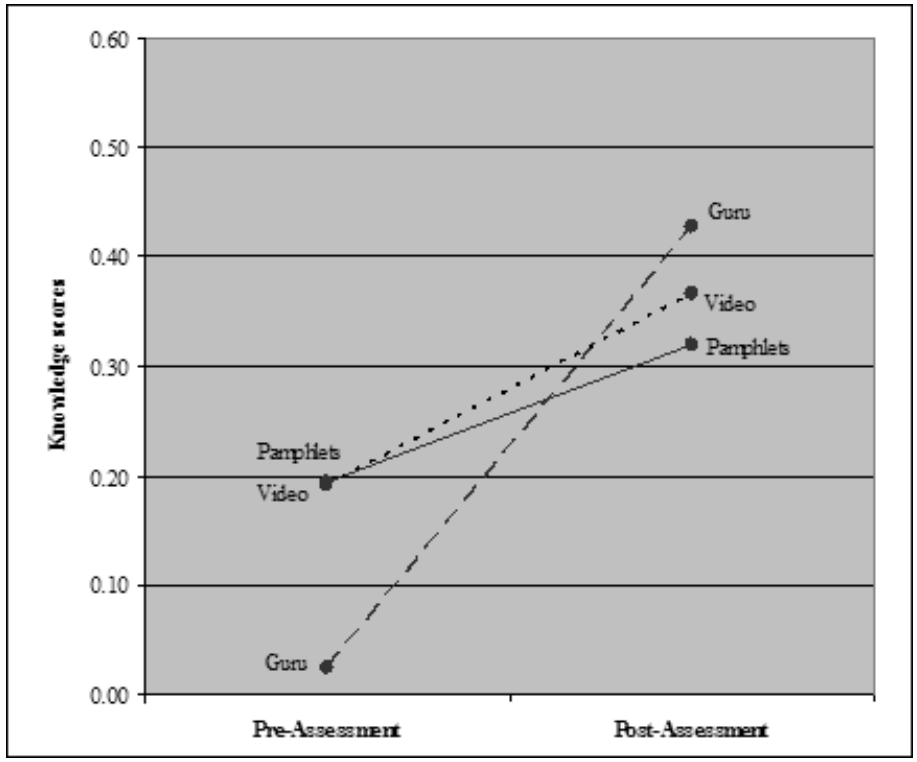
Nevertheless, the ANOVA revealed differences in the interaction of media and topic between the two disease modules. For example, the analysis of variance for FMD demonstrates an overall effect of media on knowledge uptake (P=0.004). Nevertheless, there was not a significant effect of topic (P=0.222), nor was there a significant interaction between media and topic (P=0.685).

Fig. 1. The interaction effect of media pre/post exposure to the FMD training module



Similarly for mastitis, while the analysis of variance demonstrated the overall effect of media (*P*<0.000).

Fig. 2. The interaction effect of media pre/post exposure to the Mastitis training module



Thus, in relation to FMD and Mastitis there was a significant interaction effect between the content and the media. As such, learning for certain types of information is related to particular modes or methods of presentation. Indeed, it appears that ICTs had a greater effect in transferring instructional vs. descriptive information to the poor. The finding becomes very important when considering diseases with particularly negative livelihood impacts for the poor such as Avian Influenza. Tools with the ability to transfer instructional messages to alter or change farmer behaviour to support livestock-based livelihoods are particularly vital.

Environmental Impact

H. Environmental impact

24. What are the direct and indirect environmental benefits related to the output(s) and their outcome(s)?

Enhancing the sustainability of livestock enterprises among the poor will obviously support benefits to the environment in relation to crop/livestock interactions. However, the software, at present, only explicitly tackles environmental issues in relation to animal health. For example, the component on Blue Tongue explores the potential benefits and constraints of spraying local environments for cullicoides.

However, project partners in India are particularly interested in adding components on traditional treatments and

their cultivation. Requests have also been put forward for a component to aid farmers in understanding the impacts of different crop/livestock interactions and increase fodder production. As such, direct positive impacts on local environments are easily achieved with such additions to the software.

25. Are there any adverse environmental impacts related to the output(s) and their outcome(s)?

There are no adverse environmental impacts associated with the software.

26. Do the outputs increase the capacity of poor people to cope with the effects of climate change, reduce the risks of natural disasters and increase their resilience?

At present, the software focuses on animal health and production issues. Therefore, it principally deals with livestock husbandry/management constraints and the diagnosis, treatment and prevention of epidemic and endemic livestock diseases. As such, a component on Highly Pathogenic Avian influenza is being added in each of the countries involved. In this manner, the outputs decrease the risk of farmers being adversely impacted by this particular disaster. Further, by encouraging farmers to seek formal healthcare services and engage in preventative disease behaviours, the incidence and prevalence of other epidemic diseases is expected to decline. In this manner, the software increases resilience to such disasters.