Mysore J. Agric. Sci., 53 (2) : 66-72 (2019)

Effectiveness of Peripatetic Training on Land Resource Inventory in Kalaburagi and Bidar districts of Karnataka

M. J. Chandre Gowda, N. Nagaraja, D. V. Srinivasa Reddy and Mallikarjun B. Hanji
ICAR - Agricultural Technology Application Research Institute (ATARI), Bengaluru
E-mail : maravalalu@yahoo.com

Abstract

The study analysed the farmers knowledge on the components of Land Resource Inventory (LRI) in Kalaburagi and Bidar districts of Karnataka. Responses were collected from 64 farmers on the selected ten components of LRI before and after the peripatetic training in the villages during September 2018 using a structured questionnaire. Pre-tests indicated that the knowledge quotient for different components ranged from 14.93 to 67.16, with an overall mean of 36.09. Four out of ten components were in 'very low' knowledge quarter (less than 25 % knowledgeable farmers) and the remaining six components were equally distributed in second and third quarters. None of the components found place in very high knowledge quarter. Post-training, the knowledge on most components improved substantially, with the knowledge quotient ranging from 67.16 to 92.54 with an overall mean of 85.78. As a result of the training, more than 75 per cent of farmers moved from 'very low/moderately low' to 'very high'knowledge on eight components. The knowledge gain was significant among senior farmers, farmers with lower education levels and food-crop growers, as these category farmers had lower pre-training knowledge compared to their counterparts. The knowledge gain on farm-specific soil maps and land classification based on soil pH were significantly different for commercial and food-crop growers. Farmers with larger holdings had better knowledge compared to their counterparts both during pre-test as well as post-test.

Keywords: Land resource inventory, Knowledge, Farmers, Peripatetic training, Extension

Karnataka has 19.05 million hectare of geographical area out of which about 10.13 m.ha is the net cultivated area. (GOK, http://raitamitra.kar.nic.in/KAN/Document/agriprop.pdf). It is estimated that about 65 per cent of cultivated land is rainfed. Scanty rainfall on one hand and deterioration of natural resources on the other are the major threats to agriculture in these conditions. In order to better understand the situations and to work out strategies to help farmers overcome the risks and uncertainties, the State Watershed Development Department and ICAR-National Bureau of Soil Survey and Land Use Planning (NBSS&LUP) have developed Land Resource Inventories (LRI) for the selected taluks in 11 districts of Karnataka, under the World Bank funded Watershed Development Project-II (Sujala-3 Project). The land resources are mapped based on soil characters/properties, climate, water, minerals and rocks, vegetation, crops and land use pattern. The LRI enables identification of farm-specific problems and potentials, suggest appropriate conservation measures, delineate suitability of the area for various uses and finally prescribe viable and sustainable land use options suitable for each and every land holding (Hedge *et al.*, 2018).

Effective utility of LRI maps and its contents depend on the extent to which farmer's capacity is built on understanding the contents of the maps and approaches to use these contents. Realizing this need, the Watershed Development Department collaborated with ICAR - Agricultural Technology Application Research Institute (ATARI), Bengaluru to organize capacity development programmes to farmers at the micro watershed/village level through its KrishiVigyan Kendra (KVK) network. The KVK subject matter specialists were trained as master trainers on the LRI components at NBSS&LUP, Bengaluru. In turn, the trainers organized peripatetic training of farmers on soil and site characteristics, hydrology, digital maps, thematic maps, land suitability of major crops covered, crop production technology and soil and water conservation practices suitable to different land areas. Unlike institutional training, the peripatetic training requires the trainers to move closer to the learners environment and engage the learners in the real-life work situations. This method was adopted as it was found effective for all category of farmers and for imparting knowledge on difficult to learn areas. The officials of the watershed development department provided additional support by sharing their knowledge and expertize about the location and local situations. There was much excitement among farmers as the LRI was a new concept, colourful maps depicted their own village and lands, and the contents were pertinent to both community as well as individuals. Every participating farmer was given an opportunity to locate his piece(s) of land on different maps and was explained the site-specific characteristics. Looking into the seriousness and interest shown by the farmers during the day-long interactions, a study was undertaken with the following objectives;

- To assess the knowledge level of farmers on different components of LRI before and after the training
- To attribute the differences in age, education, holding size and crops grown to the knowledge gain
- To associate the knowledge gain to differences in commercial crop and food crop farmers

Methodology

Considering that the project is implemented in 11 districts of the state, with majority of the districts being from Hyderabad-Karnataka region, trainings organized in the two districts of the region *viz.,* Kalaburagi and Bidar were purposively short-listed for the study. Trainings organized in the villages under the micro watersheds in the two districts during the study period (September 2018) were visited by the research staff of ATARI, Bengaluru to elicit the farmers response. Five micro-watersheds/villages visited for the purpose were Pastapura, Kanakapura, Marpalli, Ranapura and Mustarwadi. All the 150 participants in these villages were administered a pre-tested, structured questionnaire in the vernacular language. The participants filled out the 10-item questionnaire before and after the training. Responses for all the 10 questions were in 'I know' or 'I Don't Know' format and the response marked 'I know' in front of the question was awarded with a score of 1 and 0 score for 'I Don't Know'. Responses received from 64 farmers, complete on all the ten LRI components, both pre-test as well as post-test, are used for the present analysis.

Knowledge Quotient for each LRI Component was worked out by using the fallowing formula :

$$\text{KQ of } i^{th} \text{ component} = \frac{\text{No. of farmers having knowledge on } i^{th} \text{ component}}{\text{Total No. of respondents (n=64)}} \times 100$$

Based on the knowledge quotient the LRI components were grouped in the following Knowledge Quarters:

1. Very low Knowledge (VLK) – Known by less than 25 per cent farmers
2. Moderately low Knowledge (MLK) – Known by 26-50 per cent farmers
3. Moderately high knowledge (MHK) – Known by 51-75 per cent farmers
4. Very high knowledge (VHK) - Known by More than 75 per cent farmers

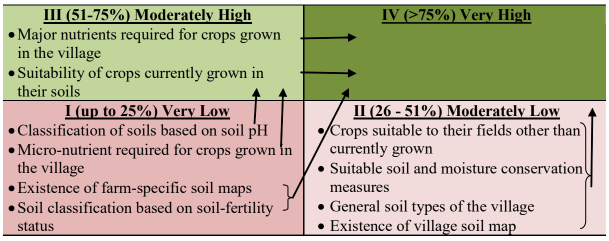
Overall knowledge quotient for all the components and all the respondents put together was calculated using the below formula;

$$\text{Overall KQ} = \frac{\sum \text{Knowledgeable farmers on 10 components}}{\text{No. of Respondents x No. of components}} \times 100$$

Chi-square test was adopted to assess the association between the gain in knowledge due to training with that of crops grown.'t' test was employed to assess the significance difference in knowledge score before and after the training.

Results and Discussion

Position and transition of LRI components in the Knowledge Quarters before and after the training is depicted in Fig. 1. Four out of 10 components were in Quarter I and three each were in II and III quarter. Existence of farm-specific soil maps, classification of soils based on soil pH, micro-nutrient required for crops grown in the village, and soil categorization based on soil-fertility status were under 'very low'(<25% farmers knowledgeable) category. Major nutrients required for crops grown in the village and suitability of crops currently grown to their soils were found under 'moderately high' (51-75% knowledgeable farmers) category. Crops suitable to their fields other than those currently grown, suitable soil and moisture conservation measures, existence of village soil maps and general soil types of the village fell in 'moderately low' (26-50% farmers knowledgeable) category. None of the components were in IV quarter before the training.



Note: arrows indicate the knowledge position of the LRI component after the training

Fig. 1: Location and Transition of LRI components in Knowledge Quarters Before and After the Trainings

Post-test data indicated that farmers knowledge on most components increased substantially as indicated by the arrows that 8 out of 10 components were shifted to 'very high knowledge' quarter after the training. Two components moved from 'very low' to 'moderately high' category after the training. None of the components remained in 'very low' and 'moderately low' knowledge categories after the training.

The reason for higher knowledge after the training is largely due to the relevance and need of the subject (content), participatory learning environment, use of visual aids, and the interactions based on the location-specific knowledge by the experienced experts. Learners being the core of the learning environment, their effort were evident by the greater level of interest shown by the trainees at the time of discourse by the experts and subsequent clarification of doubts during the discussions. That means, all the five elements of a learning situation were perfectly coherent with the training objectives that finally resulted in improved knowledge level of the learners.

The Table 1 shows the component-wise knowledge quotient values before and after the training. Prior to the training, availability of farm-specific soil maps was the least knowledgeable area with less than 15 per cent farmers expressing their knowledge. Classification of soils based on soil pH was also not known to most farmers. Micronutrients requirement of their soils and the soil classification based on soil fertility were known to only about a quarter of farmers (23.88 knowledge index). The post-training data indicate that net gain in knowledge was the highest in case of existence of farm-specific soil maps, followed by classification of soils based on soil pH. All components put together, the mean knowledge index increased by 49.69, from 36.09 before training to 85.78 after the training.

High knowledge about suitability of crops currently grown by the farmers on their soils even before training (67.16) could be attributed to the farmers experience of cultivating these crops and the knowledge of their environment. Higher knowledge on major nutrients required for the crops grown would have been the impact of extension activities carried out by different developmental agencies, including print/electronic media, over aperiod of time. Use of fertilizers that supply major nutrients has been a regular practice among farmers, which could be the other reason for greater knowledge about major nutrients. These two components were also not totally new for majority of the farmers.

Increased overall knowledge after the training can be attributed to the peripatetic method of training. Peripatetic training enabled the trainers to relate the science to actual situations, allowed the participants to compare the physical environment with that of

TABLE 1

Knowledge Quotient of LRI components before and after the training

Land Resource Inventory (LRI) Areas	Knowledge Quotient		Net gain
	Before	After	
Existence of farm-specific soil maps	14.93	83.58	68.58
Classification of soils based on soil pH	19.40	67.16	47.76
Micro-nutrient required for crops grown in the village	23.88	73.13	49.25
Soil classification based on soil-fertility status	23.88	82.09	58.21
Crops suitable to their fields other than currently grown	28.36	79.10	50.74
Suitable soil and moisture conservation measures	29.85	86.57	56.57
Existence of village soil map	38.80	92.54	53.74
General soil types of the village	40.30	80.60	40.30
Major nutrients required for crops grown in the village	58.21	83.58	25.37
Suitability of crops currently grown to their soils	67.16	91.04	23.88
Overall mean	36.09	85.78	49.69

contents in the maps and reflected by agreeing or disagreeing with the details on the maps. By peripatetic method, all difficulties can be solved and science can be effectively taught. The high quality visuals (colour maps and charts) used during the training added to the learning experience. As a result 92.54 per cent of the farmers could acquire knowledge about the village soil maps. The highest net gain was recorded on the availability of farm-specific soil maps. About 84 per cent farmers could locate their lands on the map and relate the soil properties in the maps to the actual situation of their soils in their farms. Soil pH based classification appeared to be a difficult area to understand even after the training as the knowledgeable farmers was the least (67.16 %) among all the LRI components, even after the training.

The assumption relevant to experiential learning that significant learning takes place when the subject matter is perceived by the learners as relevant to own purposes perfectly supports the findings. The ecological environment like training setting that created a learning situation in the backdrop of the village environment could have also resulted in immediate learning of the basic components of LRI. The behavioural theory of learning stress the role of environment specifically how stimuli are arranged and presented and how responses are reinforced. The cognitive theory of learning also acknowledges the role of environmental conditions as influencing on learning (Schunk, 2012).

The respondents were grouped based on age, education level, holding size and crops grown and was analyzed for differences in knowledge as well as after the training (Table 2). Majority of the farmers were more than 35 years old and had lesser knowledge compared to their young counterparts. The gain in knowledge was significant for the adult senior farmers wherein the knowledge score increased from 3.5 to 8.4 out of a possible score of 10. On educational front, the college educated farmers were less in number and had higher knowledge than the school educated before the training. The college education helped the participants to understand the LRI contents much better than all others as evident from the highest overall knowledge (9.2) after the training. Large holders were the majority and also had higher knowledge then the small holders. Commercial crop growers were the minority in number compared to food crop growers but had the highest knowledge before the training (5.2) and also had higher knowledge after the training as well.

Higher knowledge of youth before the training on the components of LRI could be the result of self-directed

TABLE 2

Differences in Knowledge before and after the training for farmers of different age, education, holding size and crops grown

Respondents (No.)			Knowledge Quotient		sd	t - value
			Before	After		
Age	Adult/senior farmers (>35 years)	47	3.6	8.4	2.145	16.487 **
	Young farmers (< 35 years)	12	4.8	8.8		
Education	School educated (upto10[th])	38	3.7	8.6	1.862	16.114 **
	College educated (>10[th])	11	4.4	9.2		
Size of farm	Large holders (>2 ha)	42	3.9	8.7	2.301	13.678 **
	Small holders (< 2 ha)	22	3.1	8.3		
Type of growers	Food crop growers	53	3.3	8.5	1.892	19.967 **
	Commercial crop growers	11	5.2	9.1		

**Significant at 0.01 level ; Note: 't' test not done for the sample size less than 30.

learning that could have happened as part of their exposure to the modern world. The self-directed learning enables youth to engage in planning, carrying out, and evaluating their own learning experiences, without the help of others. However the higher gain in knowledge among senior / adult farmers could be attributed to the andragogy concept. The andragogy concept of adult learning (Knowles, 1980) proposes that adults are problem-solvers and learn best when the subject is of immediate use to them. As an individual matures he / she accumulates an expanding reservoir of experience, become an increasingly rich resource for learning and at the same time provides a broadening base to which to relate new learnings.

Education was found to be the critical factor that enabled farmers to acquire knowledge related to most components of the land resource inventories. Education improves information learning. on one hand it gives better access to sources of information and on the other, helps understanding new information. Urvashi and Bhardwaj (2012) revealed the positive influence of education with adoption of new technology. Education is more fundamental to development in general and more particularly in the context of use of new technologies (Chandre Gowda and Dixit, 2015).

Choice of crops grown by farmers is an indicator of their economic motivation. Growing cash crops and commercial crops in a rainfed environment is a risky proposition, but some farmers do so driven by the urge to earn more returns. Economic motivation is one of the inducers to take up venturesome risky activities as evident from the research study on precision farmers (Sangeetha *et al*., 2013). The commercial seed producers had higher economic motivation than other farmers (Archana, 2013).

Table 3 shows total number of knowledgeable farmers on each component before and after training divided under the two categories of growing commercial and field crops. Out of 64 participants, only 11 farmers cultivated commercial / cash crops and remaining cultivated the food crops such as millets, pulses, cereals and oilseeds. The gain in knowledge was statistically significant for two LRI components *viz.,* farm-specific soil maps and classification of soils based on pH, as these two were difficult and new areas for most farmers. Differences in knowledge gain between commercial crop growers and food crop growers before and after the training revealed interesting facts. Before the training, the percentage of knowledgeable farmers for different components among commercial crop growers ranged from 36.4 to 72.7 per cent,

TABLE 3

Knowledgeable farmers on LRI components before and after the training and its association with crops grown

LRI components	Type of Crop	Farmers (No)	Knowledgeable Farmers (No) Before		After		Chi square (n=64)
Farm-specific soil map	Commercial	11	4	(36.40)	9	(81.80)	3.07 *
	Food crop	53	6	(11.30)	47	(88.70)	
Classification of soils based on soil pH	Commercial crop	11	8	(72.70)	10	(90.90)	7.28 **
	Food crop	53	5	(9.40)	35	(66.00)	
Micro nutrient required for crops grown in the village	Commercial	11	5	(45.50)	9	(81.80)	1.18
	Field crop	53	11	(20.80)	40	(75.50)	
Soil classification based on soil fertility	Commercial	11	4	(36.40)	9	(81.80)	0.618
	Food crop	53	12	(22.60)	46	(86.80)	
Other suitable crops for their fields	Commercial	11	7	(63.60)	11	(100)	1.93
	Food crop	53	12	(22.60)	42	(79.20)	
Suitable soil and moisture conservation measures	Commercial	11	5	(45.50)	10	(90.90)	0.576
	Food crop	53	15	(28.30)	48	(90.60)	
Village soil map	Commercial	11	5	(45.50)	11	(100)	0.0273
	Food crop	53	21	(39.60)	51	(96.20)	
Soil types of village	Commercial	11	5	(45.50)	10	(90.90)	0
	Food crop	53	22	(41.50)	44	(83.00)	
Major nutrients required for crops grown in the village	Commercial	11	8	(72.70)	11	(100)	0.0109
	Food crop	53	31	(58.50)	45	(84.90)	
Suitability of currently grown crops to their soils	Commercial	11	6	(54.50)	10	(90.90)	0.189
	Food crop	53	39	(73.60)	51	(96.20)	
Overall Knowledge Quotient	Commercial crop			51.81		90.09	
	Food crop growers			28.13		77.01	

Figures in parenthesis indicate percentage

whereas among the food crop growers, the knowledgeable farmers percentage ranged from 9.4 to 73.6. The percentage of knowledgeable farmers after the training ranged from 66.0 to 96.2 per cent for food crop growers as against 81.8 to 100 per cent for commercial crop farmers.

The overall knowledge quotient for the commercial crop growers before the training was 51.81 as compared to 28.13 for food crops growers, a difference of 23.68. However, this gap was reduced to 13.08 after the training, as the post-training overall knowledge quotient of food crop growers increased to 77.01. This shows the effectiveness of training that succeeded in building the capacity of the farmers on the importance of soil health management.

The paper brings out valuable insights into the effectiveness of peripatetic training in educating the farmers on less-known contents of land resources inventories. The results have implications for trainers in identifying the difficult areas that have lower proportion of knowledgeable farmers even after training. Such components probably may need careful planning for reinforced learning opportunities. Trainees with lower level education and owning small holdings need special attention to enhance the effectiveness of training. Planners and funding agencies of the Sujala watershed development could derive a sense of accomplishment from the impressive results revealed by the study and may be further encouraged to plan for scaling up of the capacity building activities in the ongoing project areas and also for expanding the project itself to new areas.

References

ARCHANA, K. N., 2013, Astudy on entrepreneurial behaviour of commercial seed growers of Dharwad district. *M.Sc. Thesis* (Unpub.), University of Agricultural Sciences, Dharwad.

CHANDRE GOWDA, M. J. AND SREENATH DIXIT, 2015, Influence of farmers educational level on comprehending, acting-upon and sharing of agro advisories. *Journal of Agriculture and Rural Development in the Tropics and Subtropics,* **116** (2) : 167 - 172.

GoK, Profile of Agriculture Statistics, Karnataka State Department of Agriculture, Bengaluru http://raitamitra.kar.nic.in/KAN/Document/agriprop.pdf

HEGDE, R., NIRANJANA, K. V., SRINIVAS, S., DANORKAR, B. A. AND SINGH, S. K., 2018, Site-specific land resource inventory for scientific planning of sujala watersheds in Karnataka. *Current Science*, **115** (4) : 644 - 652.

KNOWLES, M., 1980, The modern practice of adult education: Andragogy versus pedagogy. Rev. and updated ed. Englewood Cliffs, NJ: Cambridge Adult Education.

SANGEETHA, S., PRAVEEN S., AND JAISRIDHAR, P., 2013, Study on The Economic Motivation Level of Farmers in the Adoption of Precision Farming Technology. *International Journal of Scientific Research*, **2** (2) : 402 - 403.

SCHUNK, DALE, H., 2012, Learning Theories: An Educational Perspective, 6th ed. Pearson Education, Inc., as Allyn & Bacon, Boston.

URVASHI, N. AND BHARDWAJ, R. L., 2012, Socio-economic upliftment of tribal women through retail marketing in Rajasthan. *Journal of Extension Systems*, **28** (2) : 67 - 77.

(*Received :* April, 2019 *Accepted :* June, 2019)