



Profile Characteristics of Extension Personnel and their Association with Attitude towards ICT Tools and Information Management Patterns

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Abstract— Extension personnel are increasingly expected to function as information managers, yet the personal and situational factors that shape this capacity remain under-examined for Tamil Nadu's Departments of Agriculture and Horticulture. This study profiled 121 extension personnel (Agricultural/Horticultural Officers, Assistant and Deputy Directors) across Coimbatore, Tiruppur and Erode districts and examined the association and contribution of fifteen profile variables with their attitude towards Information and Communication Technology (ICT) tools and their information management patterns, using correlation and multiple regression analysis. Organizational climate and managerial ability emerged as the only variables contributing significantly to both outcomes, while work experience, value orientation, technical knowledge, job involvement and media talks and publications additionally predicted attitude ($R^2 = 0.652$, $F = 7.182^{**}$), and educational status, possession of communication gadgets, achievement motivation and trainings undergone additionally predicted information management patterns ($R^2 = 0.724$, $F = 11.327^{**}$). These results indicate that favourable organizational climate and stronger managerial ability are the most consistent, generalisable levers for improving both ICT attitude and information management performance, ahead of variables specific to only one outcome, and provide extension administrators an evidence-based basis for prioritising capacity-building investment.

Keywords—Extension personnel, Profile characteristics, ICT attitude, Information management, Multiple regression



I. INTRODUCTION

Agricultural extension is transitioning from a linear technology-transfer function to a pluralistic, demand-driven advisory system in which extension personnel must acquire, process and disseminate information as a core professional competency rather than an incidental duty. This transition places a premium on identifying which characteristics of extension personnel actually enable stronger engagement with Information and Communication Technology (ICT) tools and better information management, since capacity-building resources are finite and their allocation should be

evidence-based rather than uniform. A recent Principal Component Analysis-based assessment of a Digital Competency Index for Indian extension professionals found nearly half of respondents at only a medium level of digital competency, underscoring that competency gaps persist nationally and are not confined to any one state cadre (Mukherjee et al., 2026).

Profile–outcome linkages of this kind have been reported piecemeal in the literature, but rarely as a joint, multivariable regression exercise that isolates which profile characteristics matter once all others are held constant.

Complementary evidence from Krishi Vigyan Kendra personnel shows that the lack of training opportunities remains the single largest constraint to ICT adoption ahead of infrastructural or cost barriers (Singh et al., 2026), while a cadre-wise comparison of extension workers in coastal Odisha found that junior and senior officers differ systematically in which ICT competencies they hold and which they still need, implying that hierarchical position and its correlates (experience, training exposure) are not incidental but structurally linked to ICT-related outcomes (Sahoo et al., 2025). These findings motivate a study that (i) profiles extension personnel on the full set of characteristics plausibly related to information behaviour, and (ii) statistically isolates which of these characteristics independently predict attitude towards ICT tools and information management patterns, so that the two outcomes already reported for this sample (Anand and Ravichandran, 2014a; Anand and Ravichandran, 2014b) can be traced back to their determinants and translated into targeted policy action.

II. METHOD

The study was carried out in Coimbatore, Tiruppur and Erode districts of Tamil Nadu using an ex post facto research design during 2013–14. All blocks in the three districts were covered, and of the 154 extension personnel in the study area, 121 (78.57%) responded to a structured, pre-tested mailed questionnaire and constituted the sample (Agricultural/Horticultural Officers – AO/HO, n=64; Assistant Directors of Agriculture/Horticulture – ADA/ADH, n=33; Deputy Directors of Agriculture/Horticulture – DDA/DDH, n=24). Fifteen profile variables were measured: age (X1), educational status (X2), work experience (X3), organizational climate (X4), managerial ability (X5), value orientation (X6), possession of communication gadgets (X7), workload

perception (X8), technical knowledge (X9), achievement motivation (X10), job involvement (X11), job satisfaction (X12), self-confidence (X13), trainings undergone (X14), and media talks and publications (X15). Attitude towards ICT tools was measured using a seven-item scale earlier developed and standardised for this population by the Equal Appearing Interval method (Anand and Ravichandran, 2014a), and information management patterns were measured using a composite Information Management Index integrating information acquisition, processing (evaluation, treatment, storage, transformation) and dissemination, also previously validated for this sample (Anand and Ravichandran, 2014b). The association of the fifteen profile variables with each outcome was tested using Pearson correlation, and their independent contribution was estimated using multiple linear regression, with the two outcome variables entered separately as the dependent variable in each model.

III. RESULTS

Profile characteristics of extension personnel

Table 1 summarises the profile of the 121 extension personnel. Close to half (49.59%) were in the old age category, and a majority held a Bachelor's degree in Agriculture/Horticulture (57.85%), with 39.67% holding a Master's degree. Work experience was bimodal, split between less than 14 years (43.80%) and more than 20 years (41.32%). A large majority perceived organizational climate as more conducive (69.42%) and workload as high (82.64%), and most reported high technical knowledge (68.60%). Possession of communication gadgets at home skewed towards the medium category (51.24%), and two-thirds of respondents (67.77%) had attended more than two trainings.

Table 1. Profile characteristics of extension personnel (n=121)

Profile variable	Category	Percentage
Age	Young / Middle / Old	31.40 / 19.01 / 49.59
Educational status	B.Sc (Agri./Horti.) / M.Sc (Agri./Horti.) / Ph.D.	57.85 / 39.67 / 2.48
Work experience	≤14 yrs / 15–20 yrs / >20 yrs	43.80 / 14.88 / 41.32
Organizational climate	Moderate / More conducive	30.58 / 69.42
Managerial ability	Self doing / Getting assistance	23.14 / 76.86
Value orientation	Medium / High	33.06 / 66.94
Communication gadgets (home)	Low / Medium / High	19.01 / 51.24 / 29.75

Workload perception	Moderate / High	17.36 / 82.64
Technical knowledge	Low / Moderate / High	0.83 / 30.58 / 68.60
Achievement motivation	Low / Moderate / High	9.09 / 58.68 / 32.23
Job involvement	Less / Moderate / High	9.10 / 40.49 / 50.41
Job satisfaction	Medium / High	60.33 / 39.67
Self-confidence	Moderate / High	52.07 / 47.93
Trainings undergone	None / <2 / >2	5.79 / 26.45 / 67.77
Media talks and publications	Less / Moderate / High	9.10 / 40.49 / 50.41

Note: educational-status and communication-gadget sub-categories condensed for brevity; full cadre-wise breakdowns (AO/HO, ADA/ADH, DDA/DDH) are available from the corresponding author.

Association and contribution of profile variables with attitude towards ICT tools

Correlation analysis showed that work experience, organizational climate, trainings undergone and media talks and publications were positively and significantly associated with attitude towards ICT tools at the 1% level, while achievement motivation, job satisfaction and self-

confidence showed no significant association. Multiple regression (Table 2) explained 65.2% of the variance in attitude ($R^2 = 0.652$, $F = 7.182$, $p < 0.01$). Seven of the fifteen variables contributed significantly: work experience, organizational climate, managerial ability, value orientation, technical knowledge, job involvement and media talks and publications, each with a positive partial regression coefficient.

Table 2. Association and contribution of profile variables with attitude towards ICT tools

Profile variable	r	b	SE	t
Age (X1)	-0.361**	0.610	1.422	0.429 NS
Educational status (X2)	0.324**	-1.062	0.876	-1.212 NS
Work experience (X3)	0.031**	2.964	1.931	1.535**
Organizational climate (X4)	0.098**	0.791	1.200	3.158**
Managerial ability (X5)	0.220	0.588	0.194	2.257*
Value orientation (X6)	0.510**	0.394	2.197	2.910**
Communication gadgets (X7)	0.320**	-1.129	1.952	-0.578 NS
Workload perception (X8)	-0.375**	-3.159	2.379	-1.328 NS
Technical knowledge (X9)	0.364**	0.759	0.344	2.205*
Achievement motivation (X10)	0.172 NS	0.299	0.293	1.022 NS
Job involvement (X11)	-0.047 NS	0.580	0.220	2.635**
Job satisfaction (X12)	-0.206 NS	-1.566	2.341	-0.669 NS
Self-confidence (X13)	0.093 NS	0.289	0.175	1.651 NS
Trainings undergone (X14)	0.465**	0.073	0.335	0.217 NS

Media talks/publications (X15)	0.365**	0.933	0.351	2.661**
Constant = 8.518	$R^2 = 0.652$			$F = 7.182^{**}$

* Significant at 5%; ** Significant at 1%; NS – Non-significant; r = simple correlation coefficient; b = partial regression coefficient; SE = standard error of b ; t = t -value of b ($df = 105$).

Association and contribution of profile variables with information management patterns

For information management patterns, educational status, value orientation, workload perception, technical knowledge and job involvement showed significant positive association at the 1% level, and job satisfaction and self-confidence at the 5% level; managerial ability and achievement motivation showed no significant simple correlation. The regression model (Table 3) explained 72.4% of the variance ($R^2 = 0.724$, $F = 11.327$, $p < 0.01$). Six

variables contributed significantly: educational status, organizational climate, managerial ability, possession of communication gadgets, achievement motivation and trainings undergone. Possession of communication gadgets, although positively correlated with information management patterns ($r = 0.435^{**}$), carried a negative partial regression coefficient ($b = -2.063$) once the other variables were held constant, indicating a suppression effect: gadget ownership per se does not improve information management beyond what is explained by the other profile characteristics.

Table 3. Association and contribution of profile variables with information management patterns

Profile variable	r	b	SE	t
Age (X1)	-0.268**	-0.663	0.707	-0.937 NS
Educational status (X2)	0.260**	1.062	0.519	2.048*
Work experience (X3)	0.185**	0.671	0.780	0.860 NS
Organizational climate (X4)	0.031**	1.716	0.600	2.862**
Managerial ability (X5)	0.011 NS	0.549	1.544	3.595**
Value orientation (X6)	0.306**	-2.419	1.372	-1.763 NS
Communication gadgets (X7)	0.435**	-2.063	0.910	-2.267*
Workload perception (X8)	0.306**	2.395	1.226	1.953 NS
Technical knowledge (X9)	0.406**	0.045	0.171	0.262 NS
Achievement motivation (X10)	0.053 NS	0.438	0.194	2.257*
Job involvement (X11)	0.273**	-0.021	0.140	-0.153 NS
Job satisfaction (X12)	0.160*	-1.988	1.289	-1.542 NS
Self-confidence (X13)	0.190*	0.198	0.139	1.423 NS
Trainings undergone (X14)	0.588**	0.529	0.246	2.148*
Media talks/publications (X15)	0.499**	0.191	0.203	0.944 NS
Constant = 18.638	$R^2 = 0.724$			$F = 11.327^{**}$

* Significant at 5%; ** Significant at 1%; NS – Non-significant; r = simple correlation coefficient; b = partial regression coefficient; SE = standard error of b ; t = t -value of b ($df = 105$).

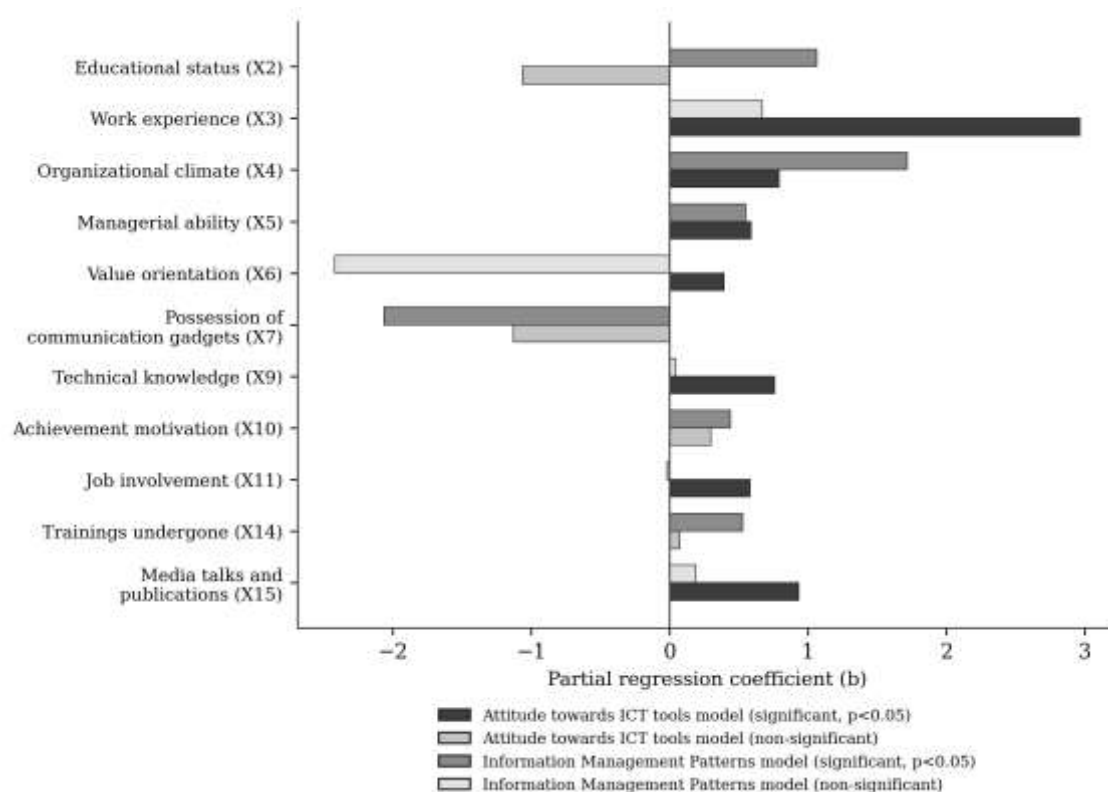


Fig.1: Partial regression coefficients of profile variables on attitude towards ICT tools and on information management patterns (variables non-significant in both models – X1, X8, X12 and X13 – are omitted)

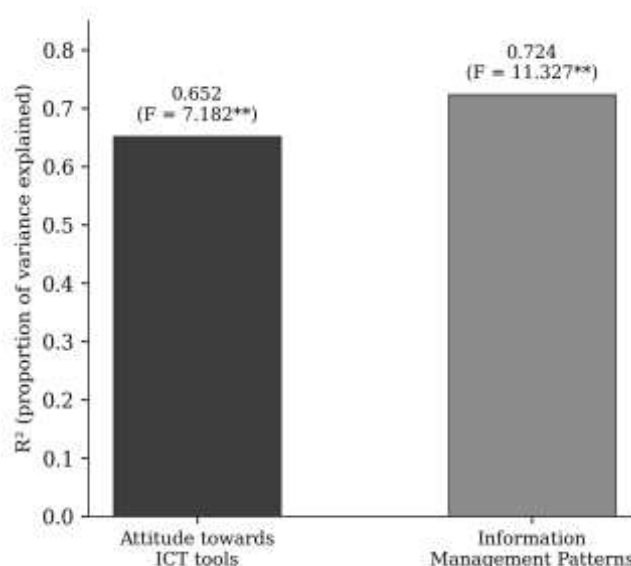


Fig.2: Variance explained (R^2) by the attitude and information-management regression models

IV. DISCUSSION AND CONCLUSION

Work experience, organizational climate and technical knowledge exhibited an expected positive relationship with attitude towards ICT tools: longer service builds the confidence and familiarity needed to engage ICT tools productively, and a conducive organizational climate

removes a structural barrier to forming favourable attitudes rather than merely correlating with them. Managerial ability and value orientation also predicted attitude independently, consistent with the view that ICT engagement is as much a managerial and dispositional competency as a technical one. Notably, trainings undergone, although not an

independent predictor of attitude once the other variables were controlled, showed a strong positive simple correlation with it ($r = 0.465^{**}$). A recent study of KVK personnel found lack of training opportunities to be the single largest constraint to ICT adoption (Singh et al., 2026); the present results suggest that where training has occurred, as in this sample (67.77% attended more than two trainings), it is associated with a more favourable attitude, reinforcing rather than contradicting the constraint-side finding.

Figure 1 makes the comparison across both regression models explicit. Organizational climate and managerial ability are the only two variables that contribute significantly and positively to both outcomes, while the remaining significant predictors are largely outcome-specific: work experience, value orientation, technical knowledge, job involvement and media talks and publications for attitude; and educational status, possession of communication gadgets, achievement motivation and trainings undergone for information management patterns. This pattern is consistent with a recent cadre-wise comparison of extension personnel in coastal Odisha, which found that junior and senior officers diverge in which specific ICT competencies they hold, implying that hierarchy-linked variables such as experience and training operate somewhat differently on attitude formation versus on management behaviour rather than acting as a single undifferentiated 'ICT-readiness' factor (Sahoo et al., 2025). The stronger fit of the information-management model ($R^2 = 0.724$ against 0.652; Figure 2) further suggests that information management, being a more procedural and habitual set of behaviours, is more fully determined by stable profile characteristics than attitude, which retains a larger unexplained, plausibly dispositional or contextual, component.

Practically, since organizational climate and managerial ability are the only variables that move both outcomes together, they represent the most generalisable and cost-effective entry point for administrative intervention – improving supervisory climate and managerial skill-building would be expected to lift both ICT attitude and information management performance simultaneously, whereas upgrading technical knowledge alone would be expected to improve attitude more than management behaviour, and vice versa for qualification- and training-linked interventions. This distinction directly extends the Digital Competency Index finding that a substantial share of extension professionals remain at only medium digital competency (Mukherjee et al., 2026): the present results indicate that closing that gap requires attention to organizational and managerial conditions, not technical exposure alone.

In conclusion, profiling 121 extension personnel across three Tamil Nadu districts and regressing their previously reported attitude and information-management outcomes on fifteen profile variables identified organizational climate and managerial ability as the sole variables contributing significantly to both, with the remaining significant predictors specific to one outcome or the other. The information-management model explained a materially larger share of variance than the attitude model, indicating that management behaviour is more profile-determined than attitude. These findings offer extension administrators a differentiated, evidence-based basis for capacity building: organizational-climate and managerial-skill interventions for broad-based gains, and outcome-specific interventions (technical-knowledge upgrading and encouragement of media talks and publications for attitude; higher academic qualification and structured training for information management) where a narrower, targeted gain is sought.

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