TERMINAL REPORT

SECOND UPLBCF-IDRC FORESTRY RESEARCH COURSE

Prepared by: DR. CELSO B. LANTICAN
Course Coordinator and
Dean, UPLB College of Forestry

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Course Title	:	Forestry Research Course
Course Description	:	Design and analysis of experiments in forestry
Course Duration	:	2.5 months, August 16 to October 31, 1983
Funding Agency	:	International Development Research Center of Canada (IDRC)
Implementing Agency	:	UPLB College of Forestry
Course Coordinator	:	Dean CELSO B. LANTICAN
Course Schedule	:	

Dates	Topics	Resource Person
August 16	Opening Program	
	Overview of the forestry research course	C. B. LANTICAN
	Review of elementary statistics	V. A. FERNANDEZ
17-19	Review of elementary statistics	V. A. FERNANDEZ
22	Comparison of two-groups by t-test	V. A. FERNANDEZ
23-24	Basic considerations in designing experiments; assumptions underlying the analysis of variance; completely randomized design	R. B. RAPERA
25-26	Randomized complete block design; Latin square design	R. B. RAPERA
29-31	Treatment comparisons; mathematical models; tests for non-additivity; transformation of data	A. V. REVILLA,JR.
Sept. 1-2	Factorial experiments	E. D. BELLO
5-7	Factorial experiments	E. D. BELLO

Dates		Topics	Resource Person
Sept.	8-9	Determining appropriate F-tests in the analysis of variance; orthogonal polynomial analysis	C. B. LANTICAN
	12-16	Split plot and other designs	N. Q. ZABALA
	19-21	Linear regression and correlation; partial correlation	G. A. MENDOZA
	22-25	Field trip to Northern Luzon	
	26-30	Multiple linear regression, non-linear regression; selecting the "best" regression equation	G. A. MENDOZA
Oct.	3-7	Analysis of covariance	C. B. LANTICAN
	10-11	Chi square tests	V. A. FERNANDEZ
	12-14	Discriminant functions	C. B. LANTICAN
	17-19	Case Studies:	
		Two-stage least squares (yield prediction)	G. A. MENDOZA
		Two-stage least squares (forest products)	P. V. SIBAL
		Sampling	A. V. REVILLA, JR.
		Wood quality evaluation	C. B. LANTICAN
		Forestry education	L. L. REBUGIO
	20-21	Project identification and formulation; data processing	M. L. BONITA
	24-25	Technical writing	P. F. YAPTENCO
	26-28	Presentation of individual projects	C. B.LANTICAN

Dates	Topics	Resource Persons
Oct. 29	Review and evaluation	C. B. LANTICAN
	CLOSING PROGRAM	
30-31	Departure of participants	

Participants:

AFRICA (TANZANIA)

Dr. Godwin Sigueli Kowero

Mr. Shabani A. O. Chamshama

BURMA

U Tun Hla

U Mehm Ko Ko Gyi

U Sein That

CHINA

Mr. Qua Zhong

Mr. Zhou Hongze

INDONESIA

Ir Slamet Riyadhi Gadas

Ir Han Rolladi

INDIA

Shri Jagjit Lamba

Shri Neelamadhab Misra

Shri B. N. Srivastava

EAST MALAYSIA

Mr. Timbah Bin Intu

Mr. Abang Abdul Hamid

WEST MALAYSIA

Mr. Abdul Rashid Malik

Mr. Mohamad Rashid Ibrahim

NEPAL

    · Mr. Moti Bajracharya

      Mr. Kedar M. Singh

      Mr. Dhan Lall Shrestha

PAKISTAN

    Mr. Fazle Subhan ✓

PAPUA NEW GUINEA

    Mr. Alvin Inammol

PHILIPPINES

    Mr. Sofredo Chua

    Mr. Jesus M. Castillo

    Mr. Bernardo A. Mendoza

SRI LANKA

    Mr. Batugedara Davithalage Samaraweera

THAILAND

    Mr. Jerdpong Makaramani

    Mr. Pairush Boonnorm

Performance of Participants:

All participants were able to comply with the requirements of the course satisfactorily. They attended the lectures, participated in discussions, performed their exercises, and completed the required research project proposal. A few participants, apparently, have had a lot of exposure to experimental designs and analysis before they come to Los Baños for the course.

Each participant was awarded a certificate for having completed the course during the closing program held on October 29, 1983.

Evaluation of the Training Course:

At the start of their training, the participants were asked to make a pre-training assessment of the course, based on information earlier given them. The results of this are shown in Annex A.

At the end of the training, the participants were requested to make an evaluation of the course. Twenty-one percent (21%) of the participants considered the course as extremely satisfactory and sixty-seven percent (67%) considered it as highly satisfactory. More details about the evaluation are shown in Annex B.

During the closing program, a representative of the participants was asked to deliver the group's collective impressions on the course. His speech is quoted below:

"Magandang hapon sa inyong lahat (good afternoon to you all).

On behalf of the twenty-seven (27) participants from 12 Afro-Asian countries, I have the privilege and pleasure of presenting before you, the august audience, the impressions, some candid and some platitudinous on the just concluded 2nd UPLBCF-IDRC Forestry Research Course.

The course commenced on 16th August 1983 in the College of Forestry, University of the Philippines at Los Banos. This University is a very famous place of learning in the region and it celebrated its Diamond Jubilee with due gaiety this year. We had the good

fortune of attending a Forestry Research Course here.

Before we reached here, we thought then we might get some really nice and comfortable accommodation, but instead we were put up inthe students dormitory, the comforts of which are not unknown to anyone here. But at this point, we are reminded of an old saying that time once gone cannot be recalled. But the dorm stay proved it otherwise by bringing back our good old school days of community living and if I may be permitted to say bating. The campus is really beautiful and picturesque with the benevolent Mt. Makiling, tall trees, with the seasonal blooming of flowers; big green playgrounds dotted by some creeks and the whole place is bustling with healthy activities.

The research course was quite useful and interesting on the whole, though we thought we were becoming computers with day long computations on the calculators. The main thrusts of the course has been on Statistics and it has helped us a great deal. It has shown us the direction to carry out research programs in our respective places with proper planning, design and statistical analysis. Needless to say, it has given added confidence.in the subject to each and every one of us. The course has been well designed, organized and conducted by the College of Forestry. Besides, we have had happy or interesting exposures to the various places of forestry and general interests, viz: Caliraya, Mangrove Forests, Dipterocarps

Forests, Tall Volcano, Manila Seedling Bank and pine forests around the beautiful city of Baguio; also we had few interesting exercises around Makiling Forest. The other subjects which benefited us were Research Project Proposals, Technical Writing and Computer Study.

We must bring to record the appreciation of the work done by the Course Coordinator, Dean Celso B. Lantican of the College of Forestry and the team of resource persons who conducted the course successfully with aplomb. It would be only fair if we say a few words about our coordinator of the research course. Dr. Lantican has endeared himself to each and every participant by his constant personal touch satisfying the needs of all with a touch of his infectious smile and a good sense of humor. It would not be exaggerating if I say this, though, officially we were 27, we were unofficially 27 + 1. The coordinator was always out with us on every field trip and also saw to it that the participants were usefully and constructively engaged in bowling, playing tennis, volleyball, etc.

Besides Forestry Statistics, we have learned a host of other useful things from the Filipinos. After being here for 10 weeks, the Philippines has carved a special niche in our hearts and we would love and look forward to meet the people of this great country wherever possible. We found the people here extremely nice, cordial and helpful. We could not agree more with the legendary hospitality warmth, friendliness, fun-loving, dancing-

singing and ever smiling faces of people for which the
Philippine sis known all over the world. When it comes
to smiles, the babae (ladies) are miles ahead of their
counterpart the lalaki (men) maybe the men folks had
exhausted all their smiles for the Spanish Senoritas
during the last few centuries and this recessive gene
among the male population might have become a semi-
permanent feature. Perhaps the ladies could pass a few
of their smiles to their men folks so that it is evenly
shared and there is no discrimant function on this score.

Before closing, we thank most profusely the Interna-
tional Development Research Center and each and every
member of the training staff and the support staff of
the UPLB College of Forestry for their guidance and help
in making our training and stay comfortable and a memorable
one.

In the end, we hope that there will be soon another
3rd UPLBCF-IDRC Research Course since this course has proved
to be quite useful. Further, we the participants from
different countries, take this opportunity to wish the
country of the Philippines and its great people health,
prosperity and happiness for all times to come.

Maraming salamat (Thank you),"

Let them offer of and see how many would come

CBL/lpn

PRE-TRAINING ASSESSMENT OF PARTICIPANTS

The pre-training assessment was conducted for the purpose of obtaining information that could serve as guide to the management and training staff in conducting the course to the full satisfaction of the participants, the sponsoring agency, and the members of the management and training staff themselves.

Information needed in this assessment was sought through the use of a set of questionnaire made up of both structural and open-ended questions.

FINDINGS

Each of the 27 participants of the course was given a set of questionnaire before formal training sessions started. However, only 19 or 70 per cent accomplished and returned said questionnaire. The following discussion is based on the responses of these participants.

1. Age profile of participants

    The learning group is composed of young adults, the youngest of whom is 24 years old while the oldest is 46 years of age. The bulk of whom is, however, within the age bracket 31-40 years (Table 1).

2. Highest educational attainment of participants

    Apparently, all the respondents have adequate educational foundation to go through the Forestry Research Course satisfactorily. Table 2 shows that more than two-thirds of the respondents are degree holders, while five

are college graduates without specific degrees earned.
Of the degree holders, seven (7) have BS degree, one (1)
Diploma in Forestry, four (4) MS, and one (1) Ph.D. *Who is this.*

3. **Position of Participants in their respective agency/
   organization**

   Positions or designations of the respondents in
   their respective agency have different titles or nomen-
   clatures. However, analysis of the functions of the
   different positions brought about three major categories
   of functions. Table 3 reveals that almost one-half of
   the respondents are holding positions with research
   functions, five (5) are holding administrative positions,
   and four (4) are forestry school teachers or administrators.

4. **Experience and capability in conducting research**

   Significantly, almost all the respondents have expe-
   rience in conducting research (Table 4). As regards their
   capability to conduct research, nine (9) believe that they
   have fairly adequate knowledge and skills but eight (8)
   think that they are equal to the requirements of conducting
   research (Table 5).

5. **Previous training courses attended**

   Of the 19 respondents, only nine (9) have had training
   previous to the forestry research course they are now
   attending. The training courses they have attended are
   shown in Table 6.

6. **Estimate of the degree of usefulness of their previous training to their work**

   The respondents who have previous trainings have different estimates of the degree of usefulness of such training to their present work. Six (6) of them think that their previous training is extremely useful to them in their work while two (2) just occasionally useful (Table 7).

7. **Participants' expected gains from the Forestry Research Course**

   The expected gains from the course mentioned by the respondents almost in equal number of times are "more knowledge of statistics" and "improved knowledge and skills in conducting research" (Table 8). Significantly, these expectations are congruent with the objectives of the training course.

8. **Participants' estimate of the extent to which the course be of help in meeting their expectations**

   Majority of the respondents think that the training course will be of good help to them in meeting their expectations. One-third of them, however, are inclined to believe that the course will be of great help to them (Table 9).

9. **Participants' obligations or responsibilities to enhance their own learning**

   A number of obligations or responsibilities to enhance learning were expressed by the respondents. Table 10 shows

that the obligation or responsibility to perform class exercises and participate in class discussions seem to stand out.

10. Learning styles of participants

Among the learning styles the participants were asked to rank in the order of how they suit best their own learning method or style, "learning by doing" is ranked first by majority of the respondents. "Observation/ participation" is ranked second, "seeing" is third, and "hearing" is fourth (Table 11). The ranking implies that more of the respondents learn best by doing, that is through class exercises, problem solving, or performing individual or group assignments. It also suggests that while listening to lectures seems to be the least preferred learning method by seven respondents, it could be made more effective through the use of visual aids like charts, illustrations, chalkboard, and through class discussions, field observations, or method demonstration.

11. Co-curricular activities

Insofar as non-curricular activities is concerned, the respondents opted for sports, socials and cultural activities, and field trips or outings in that order (Table 12).

12. <u>How the training center could help the participants</u>

There are a number of ways the participants think
the training center could help them while attending the
course. Quite significant are <u>tutorship in Pilipino</u> for
at least two hours a week, also tutorship in statistics,
and <u>improvement of the dormitory facilities</u> (Table 13). *Key thing!*

Table 1. Age profile of participants

AGE GROUPING	NUMBER
21-30 years	4
31-40 years	9
41-50 years	6
TOTAL	19

Table 2. Highest educational attainment of participants

EDUCATIONAL ATTAINMENT	NUMBER
BS Forestry	6
BS Agriculture	1
Diploma in Forestry	1
College graduate	5
M S	4
Ph D	1
Associate in Forestry	1
TOTAL	19

Table 3. Position of participants in their respective agency

POSITION CATEGORY	NUMBER
Research	9
Administrative	5
Education and training	4
Others	1
TOTAL	19

Table 4. Experience in conducting research

RESPONSE	NUMBER
With experience	17
Without experience	2
TOTAL	19

What were they nominated?

Table 5. Estimate of present capability in conducting research

ESTIMATE	NUMBER
More than adequate	0
Adequate	8
Fairly adequate	9
Not capable at all	0
No answer	2
TOTAL	19

Table 6.   Previous training of participants

TRAINING ATTENDED	FREQUENCY
Computer programming	2
Basic statistics	2
Agroforestry	1
Hydrology and watershed management	1
Entomology	1
Airphoto interpretation	1
Teacher training	1
Forest inventory	1
In-service training	2
Observation tour	1
None	10
TOTAL	23*

field?

in what?
vague – no value

*Some respondents have attended more than one training
course.

Table 7.   Degree of usefulness of training

DEGREE	NUMBER
Extremely useful	6
Occasionally useful	2
Sometimes useful	1
Never useful	0
TOTAL	9

Table 8. Expected gains from the Forestry Research Course

EXPECTED GAINS	FREQUENCY
Improve knowledge and skills in conducting research	11
More knowledge of statistics	10
See the Philippine countryside	1
Vague response	2
No response	2
TOTAL	26*

! at least he's honest!

* Some participants mentioned more than one expectation.

Table 9. Extent to which the training course be of help to participants in meeting their expectations

RESPONSE	NUMBER
Will be of great help	6
Will be of good help	11
It might help	0
No response	2
TOTAL	19

Table 10. Participants obligations to enhance their own learning

OBLIGATION	FREQUENCY
Perform class exercises and participate in discussions	8
Attend all lectures	3
Be more attentive in class	1
Discuss problems with other participants	1
Master practical English	1
Vague response	6
No response	5
TOTAL	**25***

* Some participants mentioned more than one obligation.

Table 11. Learning styles of participants

| LEARNING STYLE | FREQUENCY* RANK | | | | |
	1st	2nd	3rd	4th	Total
Seeing	3	5	8	1	17
Hearing	5	3	2	7	17
Learning by doing	10	3	0	4	17
Observation/participation	2	7	6	2	17

* Two respondents did not respond correctly.

Table 12. Co-curricular activities the participants would like to participate in.

ACTIVITIES	FREQUENCY
Sports (indoor and outdoor)	12
Socials and cultural activities	10
Field trips	8
Reading, watching TV and listening to music	3
No response	3
TOTAL	36*

* Some respondents gave more than one choice.

Table 13. How the training center could be of help to participants

RESPONSE	FREQUENCY
Tutorship in Pilipino	2
Tutorship in statistics	2
Exchange of research	2
Make researches of FORI, FPRDI & UPLBCF available	1
Make Library facilities available	1
Help in the preparation of research design	1
Help research projects approved by IDRC	1
More take home materials	1
Request IDRC to increase allowance	1
Improve dormitory facilities	3
Vague answers	5
No answer	7
TOTAL	27*

* Some respondents gave more than one response.

EVALUATION OF TRAINING

As established by the pre-training assessment, the participants were positive that the course will enhance their knowledge and ability to conduct better quality research in forestry.

The extent to which this expectation was met and what factors helped the participants in their performance is dealt with in this discussion.

The discussion is based on the responses of 87 percent of the participants (24 out of 27) in two separate surveys conducted at the middle and at the end of training.

FINDINGS

1. Participants' assessment of their capability to develop and conduct research in forestry after training

At the start of training, 53 percent of the participants claimed that they were barely capable of developing and conducting research in forestry while 47 percent believed that they were more than capable. After the training, 71 percent of the respondents thought that their capability has greatly improved; 10 percent, tremendously improved; while 14 percent fairly improved (Table 1).

2. Participants' estimate of the amount of knowledge gained from the topics discussed

There seems to be a varying estimate of the amount of knowledge gained from each topic discussed in the course. However, much have been learned by a greater number of respondents from all the topics except from the case study on sampling and from the topic on project identification and

formulation where not much were learned by at least a majority. *Why?*
At least a third however learned a lot from the topics on
analysis of variance, discriminant functions, technical writing
and designing experiments (Table 2).

3. New knowledge/facts learned from the course as a whole

The participants were asked to list at least five new know-
ledge/facts they learned from the course. Not all respondents
were able to mention at least five new learnings. Nevertheless, *oh?*
the most frequently mentioned are indicated in Table 3 as
follows: knowledge on technical writing, applicability of dis-
criminant functions, analysis of covariance, basic consideration
in designing experiments, analysis of variance and factorial
experiments in that order.

4. Skills in forestry research improved during training

The skills frequently mentioned as having been improved
during training are techniques of writing technical reports, *good*
preparation and presentation of project proposals, development
of research design, analyzing covariance, analyzing data, and
designing experiments (Table 4).

5. Participants' estimate of the extent to which each topic presented
help them in achieving their expectation

Each topic presented during training was of considerable
help to a greater number of respondents in meeting their expec-
tation from the course (Table 5). However, the topics that were
of very much help to at least half of the respondents are dis-
criminant functions and technical writing.

6. **Participants' estimate of the degree to which the following factors helped them achieved their expectation**

The training schedule is considered by more than two-thirds of the respondents as having a high degree of effect in the achievement of their expectation. This is followed by the training staff (67 percent), the site of training (63%), and *least?* the course content (54%). However, the factors considered as having a very high degree of help to at least a third of the respondents are the participants' relationship among themselves, the training materials, the course content and their relationship with the resource persons (Table 6).

7. **Participants' opinion on how each topic was developed or organized**

The topics thought by the majority of the respondent as well organized or developed are split plot and other designs, discriminant functions, case study on wood quality evaluation, principles of experimental designs, and analysis of variance. However, at least one third believed that the topics on technical writing, factorial experiments, linear regression and correlation, and discriminant functions were very well organized but the case study on sampling, the topics on two stage least squares as applied to forest products utilization, and the two-stage least squares as applied to yield prediction were only fairly organized (Table 7).

8. **Participants' reaction to the teaching methods/techniques used**

More than two-thirds of the respondents felt that the lecture method used in the presentation of topics was done just right. There is however a common feeling among a greater number of respondents that there is a need to use more visual aids and to do more group or class discussion, class exercises, and individual or group assignments (Table 8).

9. **Participants feeling about the overall presentation of each topic**

The respondents are almost equally divided in their feeling about the overall presentation of each topic. At least one-half felt that the presentation of the topics on technical writing and analysis of covariance was very stimulating. Also at least one-half felt that the presentation of the topics on chi-square tests, discriminant functions, and analysis of variance was quite stimulating while almost the same number found the presentation of the case studies on sampling and two-stage least squares as applied to yield prediction as fairly stimulating (Table 9).

10. **Participants' appraisal of the course as a whole**

The course was highly satisfactory. This is the appraisal of 67 percent of the respondents. However, 21 percent said that it was extremely satisfactory (Table 10).

Good!

11. **Participants' rating of factors attendant to their training course**

The factors attendant to training which were rated quite satisfactory by a greater number of respondents are the classroom facilities, classroom ventilation and classroom lighting,

while the factor rated as unsatisfactory by a majority is the *// no surprise* dormitory facilities (Table 11).

12. <u>Some details of training that need improvement should a third course be conducted in the UPLB College of Forestry in the future</u>

Consistent with their appraisal of the course as a whole, only a few details of training were recommended for improvement. The most frequently mentioned is the accommodation facilities including the provision of a "common room" where they could relax, read newspaper and magazines, watch TV or discuss things among themselves. This is followed by teaching methods, schedule of field trips or visits and the selection of places for such activities (Table 12).

13. <u>Would participants recommend to their agency the holding of a similar training in their own country</u>

Almost all the respondents (92 percent) would recommend to their respective agencies the holding of a similar training *good!* in their own country (Table 13).

Table 14, on the other hand, shows the topics that they would recommend to be included and given emphasis in the course.

14. <u>Other matters the participants would like the training staff to know</u>

Some of the comments in this section were already con- sidered as recommendations in section 12. However, there are significant comments from individual participant that need to be conveyed to the training staff. These are:

14.1. Personal thanks to the training staff for their coopera- tion and kind understanding.

14.2. Sincere gratitude to the Dean for going out of his way to help us make out stay in the Philippines more fruitful.

14.3. I followed the course happily.

14.4. Having a resource person to help us in the discussion of our proposal was very good.

(14.5.) Most of the resource persons need to improve their way of expression in the class. *oh?*

(14.6.) Resource persons should come with adequately prepared handouts. *oh?*

Differs from assessment in 7+10

14.7. Resource persons need not go too deep into the theoretical part as majority of the participants have limited mathematical and statistical background.

(14.8.) A few of the resource person could prepare the lessons a little better.

14.9. I have a general impression that most of the members of the training staff know their subject matter well. Nevertheless, it will be better still if the subjects being presented and supported with examples and problems which are associated with forestry. *weren't they? agreed*

14.10. I think the course is holiday for the Indians. They are too good for the subjects being presented. *!!*

CONCLUSIONS

The end product of a training effort is the satisfaction that comes to the participants as a result of meeting a need, solving a problem, or some other change in behavior.

The findings show in a number of instances that nearly all the participantsobtained satisfaction, although to varying degrees, from what they think they have achieved. They have gained new learnings in research, developed or improved skills that they need in developing and conducting research in forestry. In effect they have met to a considerable extent their expectation from the course.

It appears that the fulfillment of satisfaction as a result of their participation or attendance in the course is conditioned by at least five factors, namely:

1. **Subject Matter**

   The topics which were well organized and logically presented from the point of view of the participants stimu-lated them to learn and work toward the achievement of their goals.

2. **Teaching Methods**

   The teaching methods chosen and used by the individual members of the training staff helped them to a certain extent in fulfilling their learning expectation.

3. **Physical Facilities**

   Physical facilities incident in training help bring about positive or negative climate for learning. Considered as having contributed to the establishment of a conducive

climate for learning are the classroom facilities, classroom
ventilation and lighting, and recreational facilities.

4. Organizational Factors

The organizational factors that helped the partici-
pants in meeting their needs are the course content,
training staff, training schedule, training materials and
site of training.

5. Interpersonal Relationships

This factor helps in the establishment of a psycho-
logical climate that promote learning. In this course,
the relationship of the participants with the resource
persons and their relationship among themselves were
satisfying to most of them.

What about dorms? Yes! Key problem that created the petition!

/lpn
11-15-83

Table 1. Participants' assessment of their capability to develop and conduct research in forestry after their training

ASSESSMENT	NUMBER	PERCENT
Tremendously improved	3	13
Greatly improved	17	71
Fairly improved	3	13
No improvement at all	0	–
No answer	1	4
TOTAL	24	101*

* Figures do not add to 100 due to rounding.

Table 2. Participants' estimate of the amount of knowledge gained from the topics discussed.

T O P I C	A Lot		Much		Not Much		None		No Ans.		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Review of elementary statistics	3	12	7	29	9	38	–	–	5	21	24	100
Considerations in designing experiments	8	33	10	42	4	17	–	–	2	8	24	100
Analysis of variance	10	42	7	29	5	21	–	–	2	8	24	100
Factorial experiments	7	29	11	46	5	21	–	–	1	4	24	100
Split plot and other designs	4	17	13	54	4	17	1	4	2	8	24	100
Orthogonal polynomial analysis	4	17	13	54	5	21	1	4	1	4	24	100
Linear regression and correlation	7	29	10	42	3	13	2	8	2	8	24	100
Analysis of covariance	7	29	13	54	2	8	–	–	2	8	24	99*
Chi square tests	4	17	12	50	6	25	–	–	2	8	24	100
Discriminant functions	9	38	10	42	3	13	–	–	2	8	24	101*
Wood quality evaluation	4	17	12	50	6	25	–	–	2	8	24	100
Two-stage least squares as applied to yield prediction	2	8	15	63	5	21	–	–	2	8	24	100
Two-stage least squares as applied to forest products utilization	2	8	12	50	8	33	–	–	2	8	24	99*
Sampling	3	13	5	21	14	58	–	–	2	8	24	100
Project identification and formulation	2	8	8	33	11	46	1	4	2	8	24	99*
Technical Writing	8	33	11	46	3	13	–	–	2	8	24	100

* Figures do not add to 100 due to rounding.

Table 3. New knowledge/facts learned.

KNOWLEDGE/FACTS	FREQUENCY	PER CENT
Technical writing	12	14
Application of discriminant functions	10	12
Analysis of covariance	10	12
Basic considerations in designing experiments	10	12
Analysis of variance	8	10
Factorial experiments	5	6
Multiple linear regression	5	6
Aspects of split plot and other designs	3	4
Orthogonal polynomial analysis	3	4
Analysis of data	3	4
Linear regression and correlation	3	4
Two-stage least squares as applied to forest products utilization	3	4
Selection of the "best" regression equation	2	2
Wood quality determination	2	2
Determination of appropriate "F" test in the analysis of variance	2	2
Formulation of research problems	2	2
TOTAL	83	100

Table 4. Skills improved during training.

S K I L L S	FREQUENCY	PER CENT
Techniques of writing technical reports	10	20
Preparation of project proposals	8	16
Development of research design	6	12
Analyzing covariance of various designs	6	12
Data analysis	5	10
Designing experiments	5	10
Regression analysis	4	8
Application of two-stage least squares in yield prediction	3	6
Implementation of research results	2	4
TOTAL	49	98*

* Figures do not add to 100 due to rounding.

Table 5. Participants' estimate of the extent to which each topic presented helped in the achievement of expectation

TOPIC	A Lot		Much		Not Much		None		No Ans.		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Review of elementary statistics	5	21	10	42	4	17	–	–	5	21	24	100*
Considerations in designing experiments	6	25	17	71	–	–	–	–	1	4	24	100
Analysis of variance	11	46	13	54	–	–	–	–	–	–	24	100
Factorial experiments	10	42	13	54	1	4	–	–	–	–	24	100
Split plot and other designs	5	21	13	54	4	17	1	4	1	4	24	100
Orthogonal polynomial analysis	5	21	12	50	6	25	1	4	–	–	24	100
Linear regression and correlation	10	42	10	42	3	12	1	4	–	–	24	100
Analysis of covariance	7	29	13	54	2	8	–	–	2	8	24	99*
Chi square tests	4	17	12	50	6	25	–	–	2	8	24	100
Discriminant functions	9	38	10	42	3	13	–	–	2	8	24	101*
Wood quality evaluation	4	17	12	50	6	25	–	–	2	8	24	100
Two-stage least squares as applied to yield prediction	2	8	15	63	5	21	–	–	2	8	24	100
Two-stage least squares as applied to forest products utilization	2	8	12	50	8	33	–	–	2	8	24	99*
Sampling	3	13	5	21	14	58	–	–	2	8	24	100
Project identification and formulation	2	8	8	33	11	46	1	4	2	8	24	99*
Technical writing	8	33	11	46	3	13	–	–	2	8	24	100

* Figures do not add to 100 due to rounding.

Table 6. Participants' estimate of the degree to which the following factors helped in the achievement of expectation

FACTOR	DEGREE											
	Very Much		Much		Not Much		None at All		No Ans.		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Course content	8	33	13	54	2	8	-	-	1	4	24	99*
Training staff	7	29	16	67	-	-	-	-	1	4	24	100
Training materials	8	33	9	38	6	25	-	-	1	4	24	100
Training schedule	2	8	18	75	3	13	-	-	1	4	24	100
Site of training	2	8	15	63	5	21	1	4	1	4	24	100
Relationship with resource persons	8	33	7	29	8	33	-	-	1	4	24	99*
Relationship with fellow participants	10	42	11	46	2	8	-	-	1	4	24	100

* Figures do not add to 100 due to rounding.

Table 7. participants' opinion on how each topic was organized/developed.

TOPIC	Very Well N	Very Well %	Quite Well N	Quite Well %	Fairly Well N	Fairly Well %	Poorly N	Poorly %	No Ans. N	No Ans. %	Total N	Total %
Review of elementary statistics	4	17	11	46	4	17	–	–	5	21	24	100*
Considerations in designing experiments	7	29	13	54	4	17	–	–	–	–	24	100
Analysis of variance	7	29	13	54	4	17	–	–	–	–	24	100
Factorial experiments	9	38	12	50	3	12	–	–	–	–	24	100
Split plot and other designs	4	17	15	62	5	21	–	–	–	–	24	100
Orthogonal polynomial analysis	7	29	9	38	5	21	2	8	1	4	24	100
Linear regression and correlation	8	33	10	42	5	21	1	4	–	–	24	100
Analysis of covariance	10	42	12	50	–	–	–	–	2	8	24	100
Chi square tests	7	29	11	46	4	17	–	–	2	8	24	100
Discriminant functions	8	33	14	58	–	–	–	–	2	8	24	99*
Wood quality evaluation	3	13	14	58	4	17	–	–	3	13	24	101*
Two-stage least squares as applied to yield prediction	–	–	13	54	8	33	–	–	3	13	24	100
Two-stage least squares as applied to forest products utilization	1	4	10	42	9	38	1	4	3	13	24	101*
Sampling	–	–	8	33	11	46	2	8	3	13	24	100
Project identification and formulation	–	–	12	50	5	21	4	17	3	13	24	101*
Technical writing	14	58	6	25	2	8	–	–	2	8	24	99*

* Figures do not add to 100 due to rounding.

Table 8. Participants' reaction to the teaching method used.

METHOD	R E A C T I O N										
	Done Just Right		Need to Do It More		Need to Do It Less		Need To Do It		No Ans.		Total
	N	%	N	%	N	%	N	%	N	%	N	%
L e c t u r e	17	71	3	13	2	8	–	–	2	8	24	100
Class or group discussion	8	34	13	54	1	4	1	4	1	4	24	100
Class exercises	9	38	11	46	2	8	1	4	1	4	24	100
Use of visual aids	6	25	15	63	–	–	1	4	2	8	24	100
Group or individual assignment	9	38	11	46	2	8	–	–	7	8	24	100

Table 9. Participants' feeling about the overall presentation of each topic.

TOPIC	Very Stimulating		Quite Stimulating		Fairly Stimulating		Totally Stimulating		No Ans.		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Review of elementary statistics	4	17	7	29	8	33	–	–	5	21	24	100
Considerations in designing experiments	8	33	11	46	4	17	–	–	1	4	24	100
Analysis of variance	7	29	12	50	3	13	1	4	1	4	24	100
Factorial experiments	8	33	11	46	4	17	–	–	1	44	24	100
Split plot and other designs	3	13	11	46	7	29	–	–	3	13	24	101*
Orthogonal polynomial analysis	3	13	10	42	6	25	3	13	2	8	24	101*
Linear regression and correlation	6	25	10	42	6	25	1	4	1	4	24	100
Analysis of covariance	12	50	10	42	–	–	–	–	2	8	24	100
Chi square tests	3	13	15	63	4	17	–	–	2	8	24	100
Discriminant functions	9	38	12	50	1	4	–	–	2	8	24	100
Wood quality evaluation	1	4	11	46	10	42	–	–	2	8	24	100
Two-stage least squares as applied to yield prediction	1	4	9	38	12	50	–	–	2	8	24	100
Two-stage least squares as applied to forest products utilization	1	4	10	42	10	42	1	4	2	8	24	100
Sampling	1	4	6	25	14	58	1	4	2	8	24	99*
Project identification and formulation	3	13	8	33	10	42	1	4	2	4	24	100
Technical writing	14	58	8	33	–	–	–	–	2	4	24	99*

* Figures do not add to 100 due to rounding.

Table 10. Participants' appraisal of the course as a whole.

APPRAISAL	NUMBER	PER CENT
Extremely satisfactory	5	21
Highly satisfactory	16	67
Fairly satisfactory	2	8
Unsatisfactory	-	-
No answer	1	4
TOTAL	24	100

Table 11. Participants' rating of the factors attendant to their training.

FACTOR	Very Satis-factory		Quite Satis-factory		RATING Fairly Satis-factory		Unsatis-factory		No Ans.		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Dormitory facilities	1	4	2	8	8	34	13	54	-	-	24	100
Classroom facilities	7	29	11	46	6	25	-	-	-	-	24	100
Classroom ventillation	5	21	10	42	7	29	1	4	1	4	24	100
Classroom lighting	6	25	11	46	4	17	3	13	-	-	24	101*
Recreation facilities	3	13	2	8	11	46	6	25	2	8	24	100
Reference materials	1	2	13	54	6	25	2	8	1	4	24	99

* Figures do not add to 100 due to rounding.

Table 12. Details of training that need improvement.

DETAIL	FREQUENCY	PER CENT
Accommodation facilities	12	34
Teaching methods	6	17
Schedule of field trips and selection of places	4	11
Class schedule	3	9
Allowance of participants	2	6
Selection of resource persons	2	6
Sending of agreement letter and travel arrangement	2	6
Classroom facilities	2	6
Relationship between staff and participants	1	3
Supply of stationary	1	3
TOTAL	35	101*

* Figures do not add to 100 due to rounding.

Table 13. Would participants recommend to their agency the holding of a similar training in their country.

RESPONSE	NUMBER	PER CENT
YES	21	88
NO	2	8
No comment	1	4
TOTAL	24	100

Table 14. Topics to be given emphasis in the training in their country.

TOPIC	FREQUENCY	PER CENT
Designing experiments	11	27
Technical writing	6	15
Sampling methods	5	12
Regression analysis	5	10
Analysis of variance and covariance	3	8
Factorial experiments	3	3
Discriminant functions	3	8
Selection of best regression	2	5
Project formulation	2	5
Split plot and other designs	1	2
TOTAL	40	100

Key topics for normal wd

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