

Evaluating Technology Transfer in the Logging Industry. A Case Study with Portable Timber Bridges

Bob Smith

Center for Forest Products Marketing and Management
Department of Wood Science and Forest Products
Virginia Tech
Blacksburg, Virginia, USA

And

Ren-Jye (Marshall) Shiau
Department of Marketing
National Chung Hsing University
Taichung City, Taiwan

Objectives

- . Identify transfer participants methods of receiving disseminating information**
- . Determine the best channels of technology transfer for the diffusion of portable timber bridge technology to loggers.**

Project Outline

Logger's reception of transfer efforts

Evaluation of intermediaries technology transfer efforts.

Portable timber bridge developers dissemination efforts.

Conclusions

My loggers need portable bridges.



Background

Logging operations are being placed under increased scrutiny for their effects on water quality.

One practical solution is utilizing portable timber bridges for stream crossings.

New portable timber bridge technology was developed by the WIT In Morgantown, WV.

Technology transfer processes and efforts are far more complex than most research recognizes.

General Methodology

Literature search on diffusion of innovations.

Preliminary interviews with loggers, technology developers and potential intermediaries.

Start data collection with loggers and work back to portable bridge technology developers.

Perceived Technology Transfer in the Logging Industry

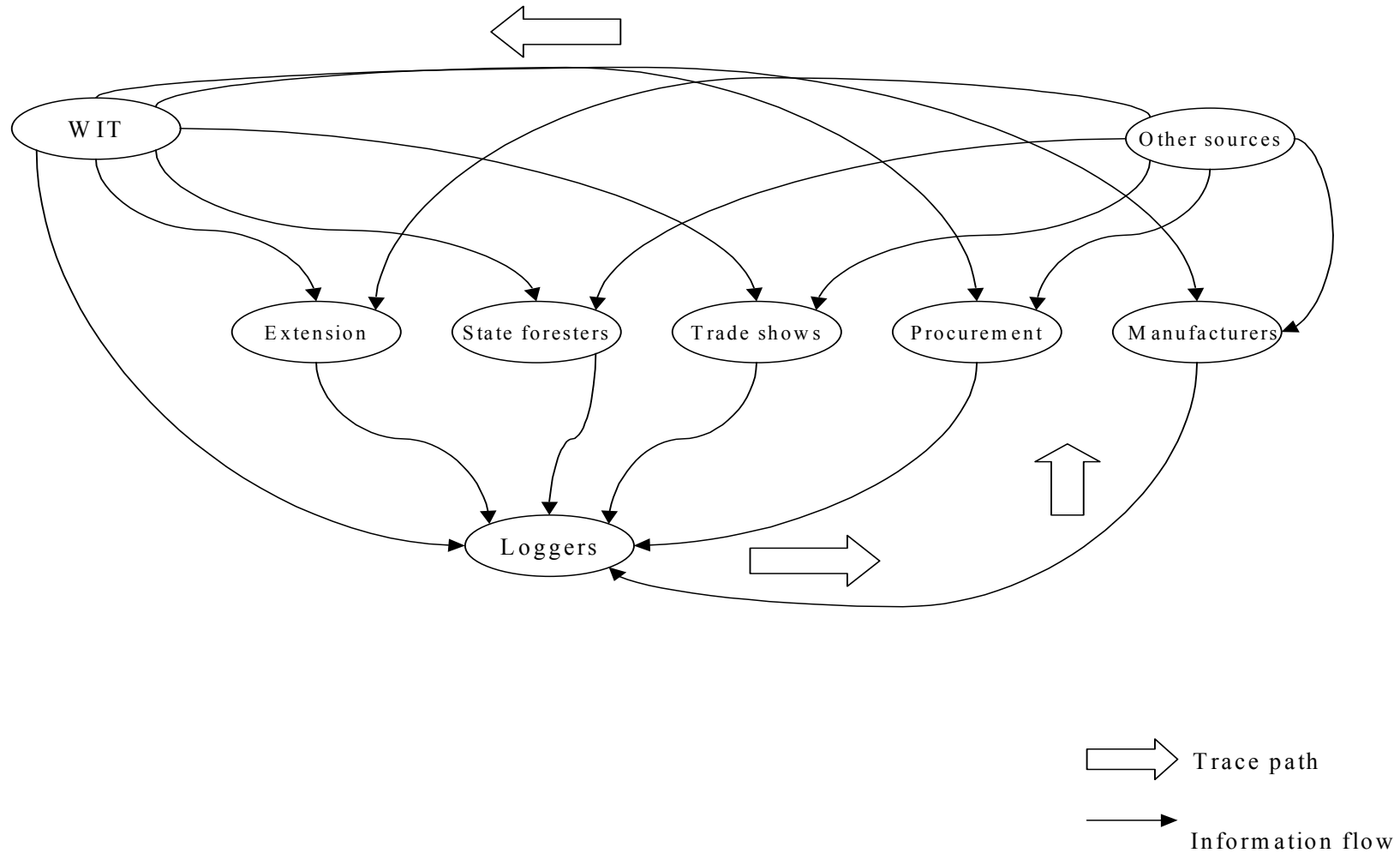


Figure 1 Perceived Technology Transfer in the Logging Industry

Logger's Research

Objectives

1. Identify which information sources are important for loggers in receiving new technology;
2. rate construction materials for their importance in the selection of a portable bridge; and
3. identify which intermediaries are the most effective communication channel(s) in transferring technology information to loggers.

Methods

Sample Frame

Loggers within the Eastern half of the US
(East, South, Mid-Atlantic, and Midwest)

Date Collection

Questionnaire

Mall intercept interview (trade shows)

Classroom (logger's education programs)

Results

8 useable questionnaires were collected

early 43 percent of respondents utilized portable timber bridges.

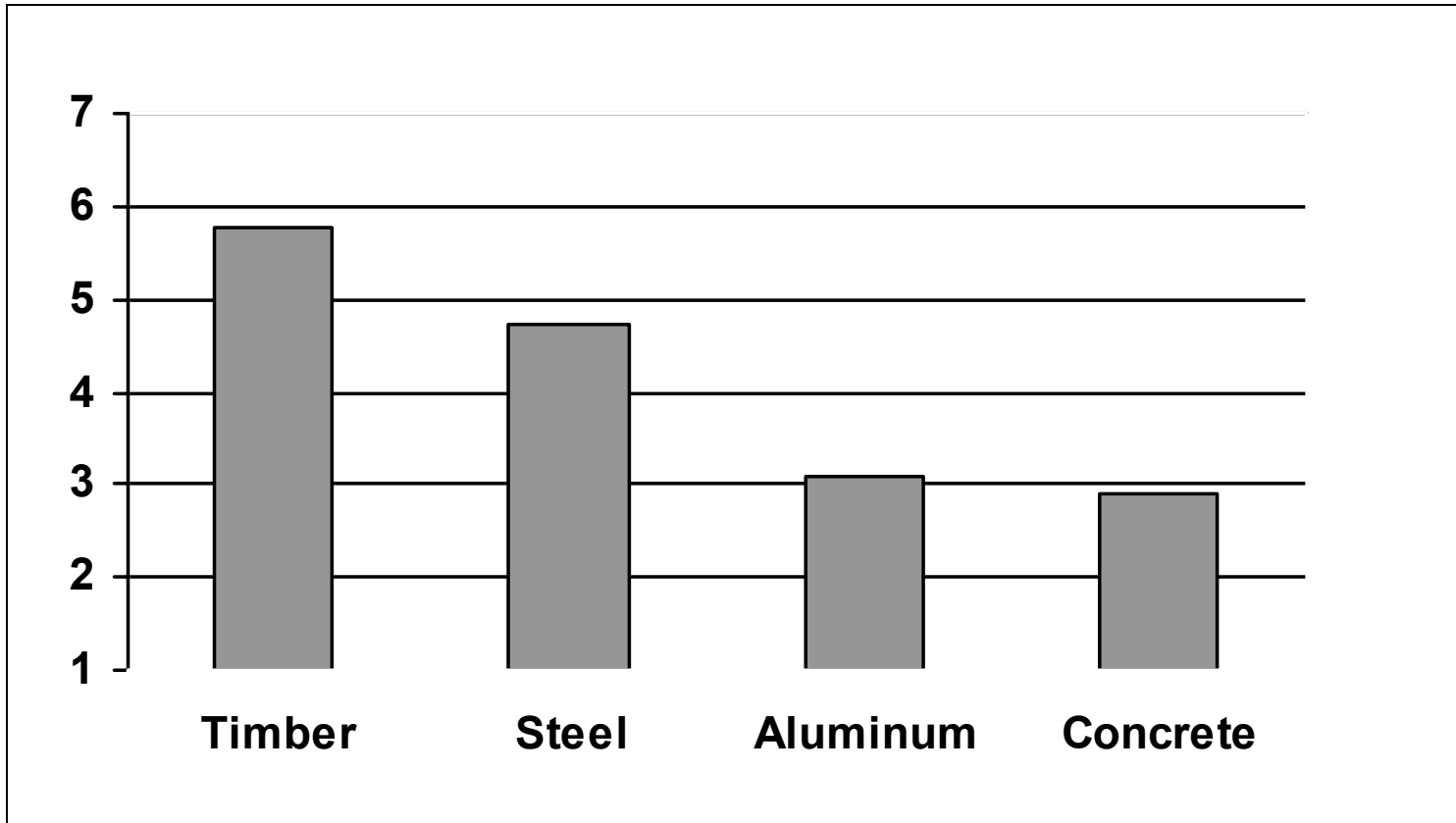


the most frequently used technology in logging operation:
wireless communication and personal computers.

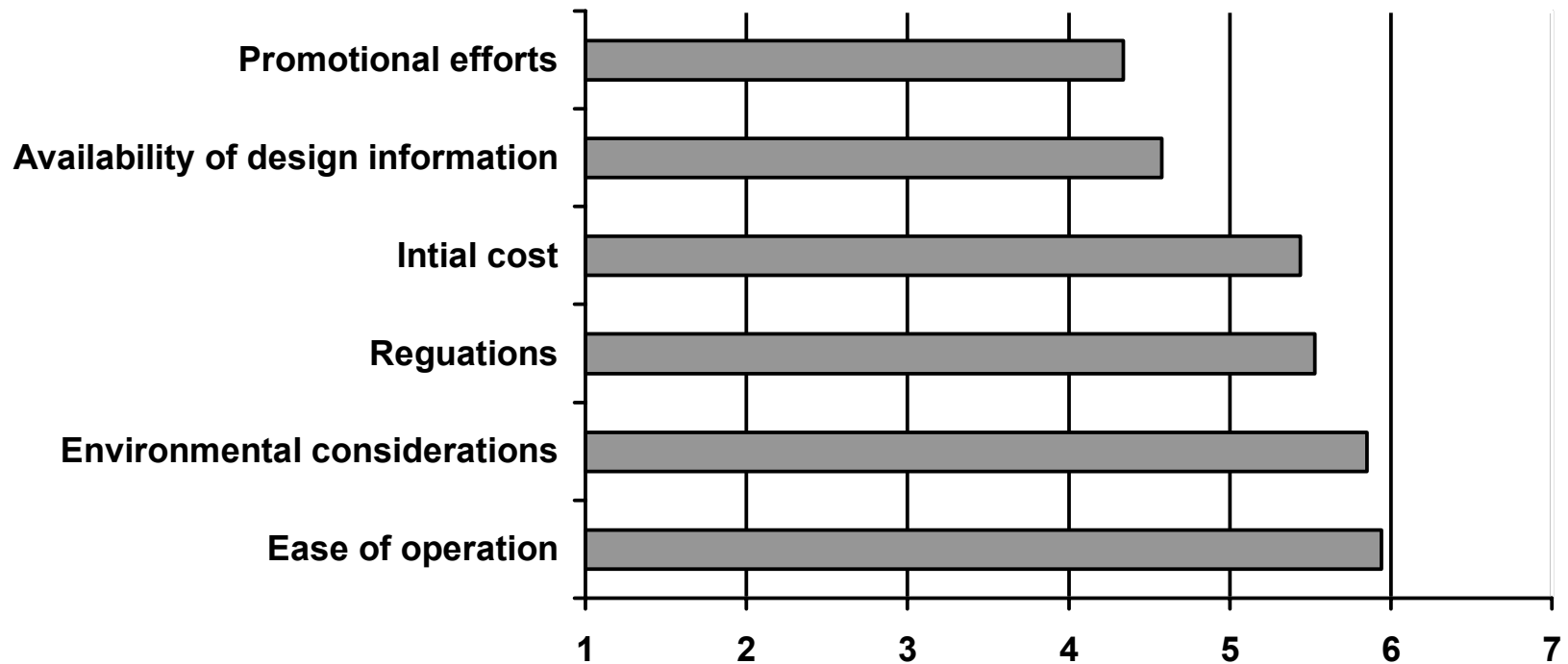
the most often used portable timber bridges:
skidder bridges, DIY bridges

where loggers learned how to use portable timber bridges:
company they logged for and field demos

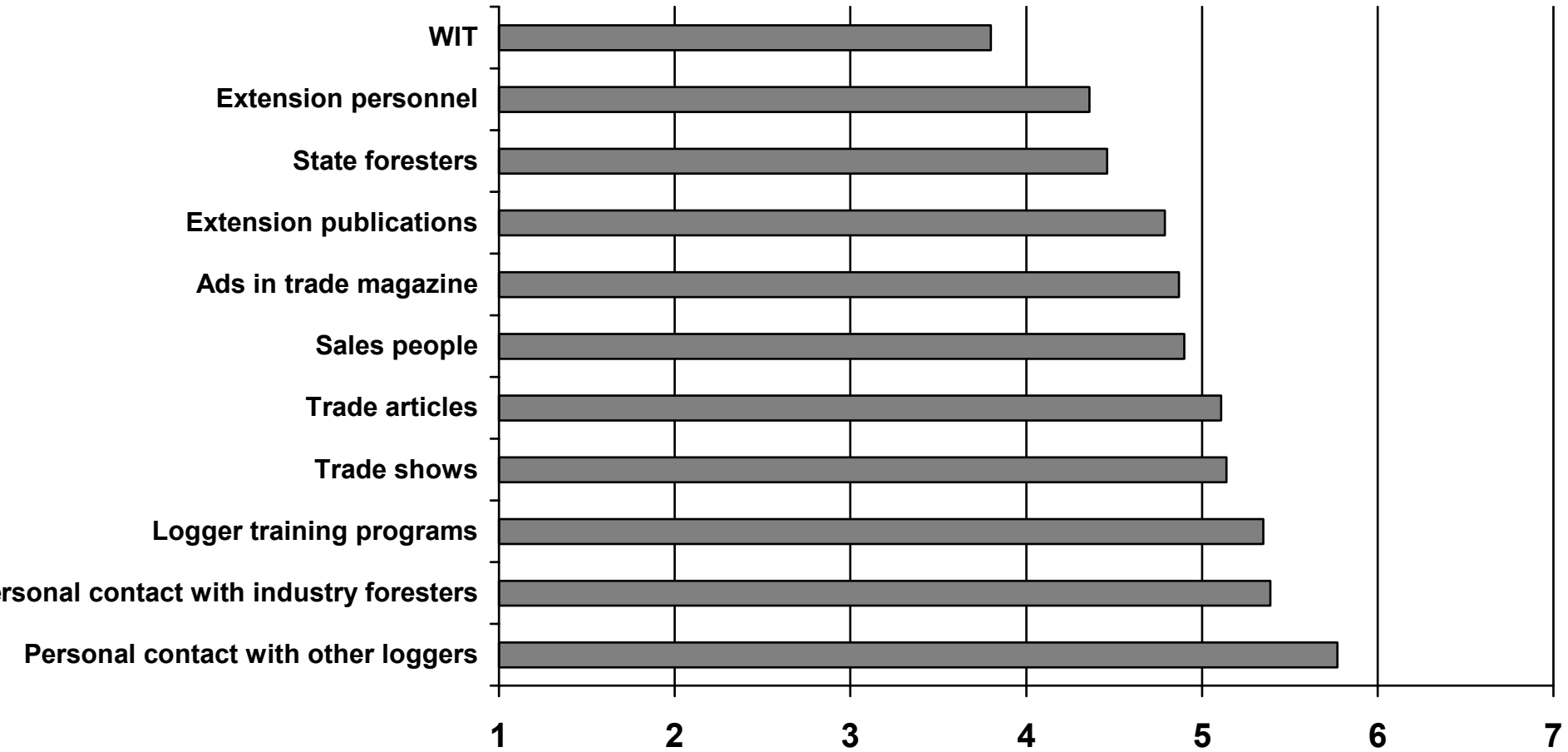
Loggers Portable Bridge Material Ratings



Why Use a Portable Timber Bridge?



Logger's Ratings of Technology Transfer Intermediaries



Results from Loggers

- * The best methods to transfer new technology to loggers:
word-of-mouth, field demos, videos, and trade shows
- * Loggers preferred personal contact methods as
important sources in receiving new information.
- * Initial cost and lack of marketing efforts were the major barriers
for the adoption of portable timber bridges technology.

Intermediaries

Objectives

1. Identify which sources are important for intermediaries in learning about new technology information;
2. evaluate the effective methods in dissemination of new technology information to end-users; and
3. identify which factors are important to influence the decision(s) in dissemination of new technology information to end-users.

Intermediaries' Methods

Sample Frame

628 Pre-identified Intermediaries by loggers
(state/local foresters, industry foresters, officers in trade associations, extension personnel, and marketing professionals in private companies)

Data Collection

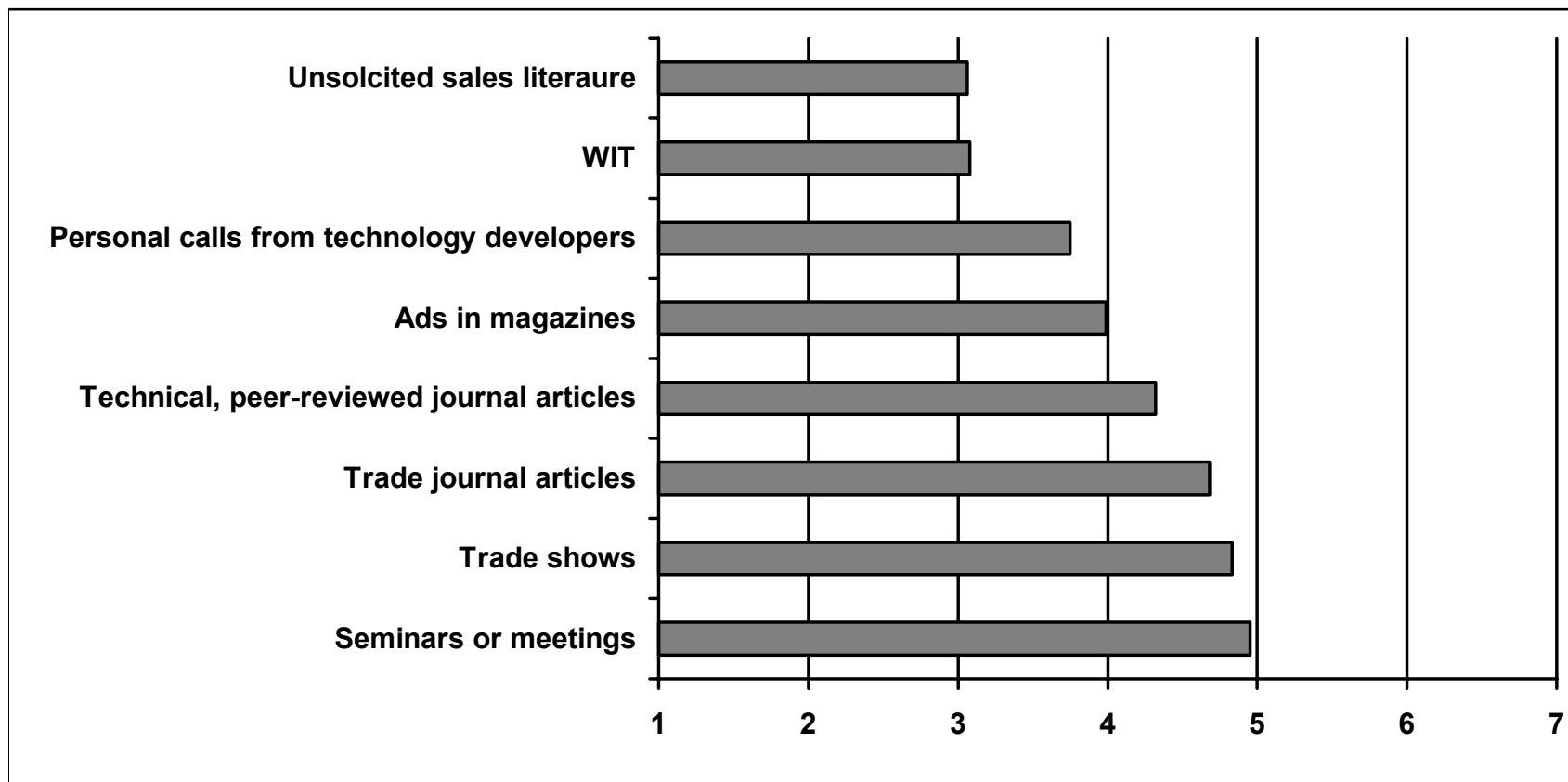
Mail Questionnaire

Response

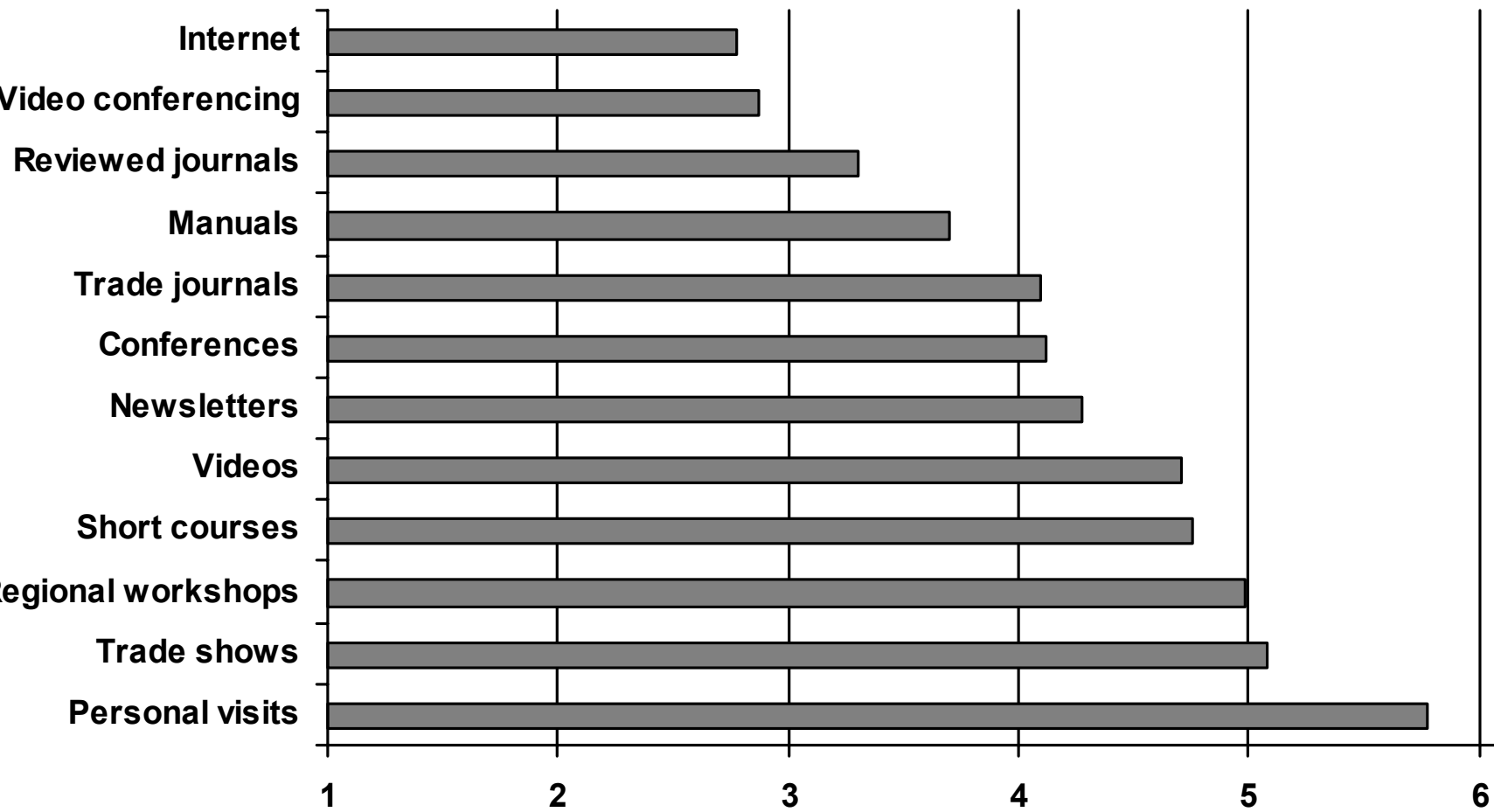
369 useable questionnaires collected

The adjusted response rate was 58 percent.

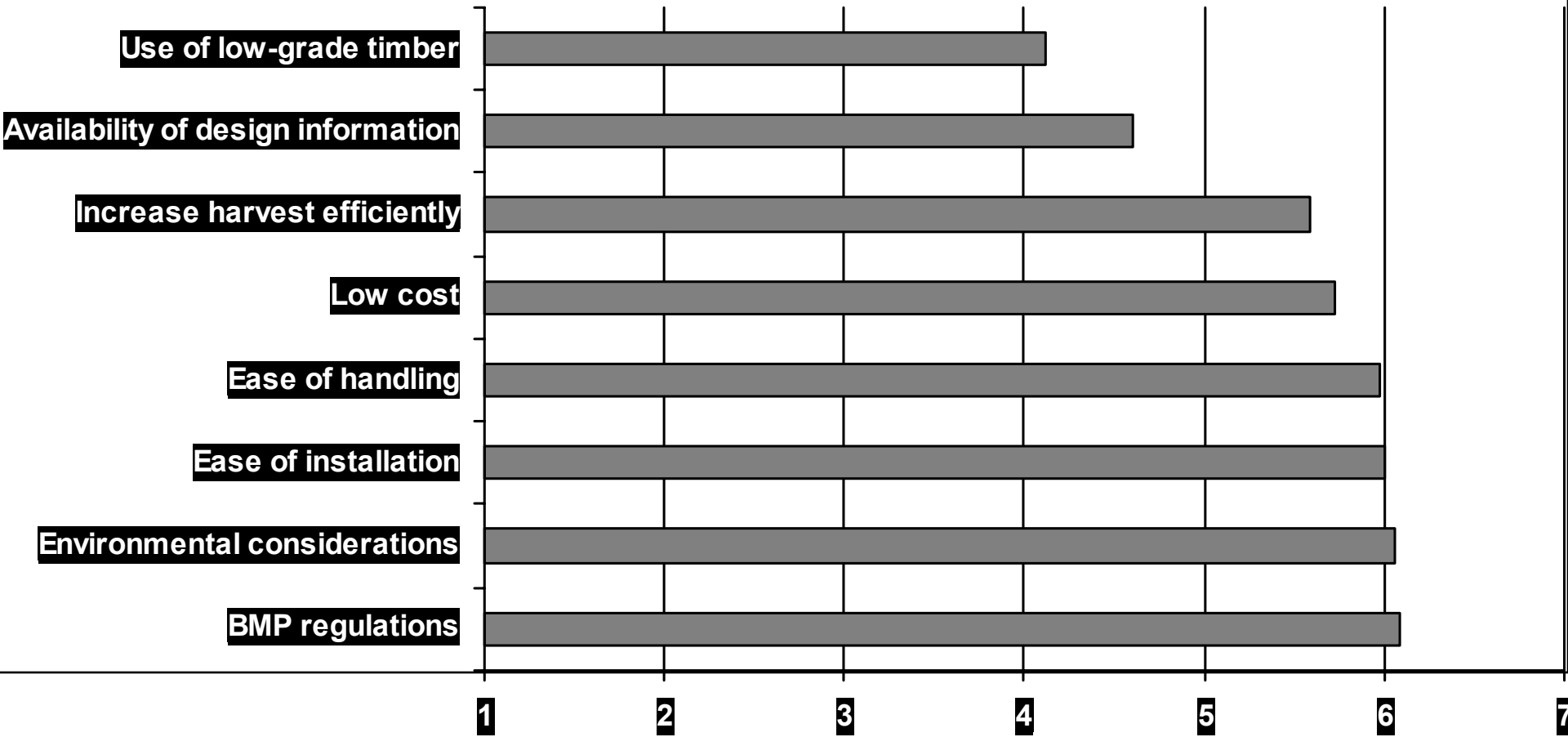
Where do Intermediaries learn about Technology?



Technology Dissemination to Loggers



Why Promote Portable Timber Bridges



Intermediaries' Results

The most frequent topic planned to be disseminated to loggers:
BMP's, logging safety issues, and environmental regulations

The most frequently disseminated type of portable timber bridge information: skidder bridges, road or deck mats, and engineered portable timber bridges

Nearly one- half of the respondents' organizations disseminated portable timber bridge information.

Sixty-six percent of industry foresters disseminated portable timber bridge information to loggers.

able Timber Bridge Technology Developers' Study

Objectives of the Study:

Identify important sources in the dissemination of new technology information;

Identify the factors influencing technology developers decisions to provide new technology for the logging industry; and

Identify which intermediaries are the most effective communication channel(s) in transferring technology developers' new technology.



Technology Developers' Study

Research Method:

Sample Frame

Technology developers who have been involved in the design of portable timber bridge for the WIT Program.

Data Collection

Questionnaire

Mail survey to 25 individuals

WIT Developers' Study

There were 15 useable questionnaires returned.

Employees at state/local governments (4), university professors (7), officers at trade associations (2), and employees at federal government (2).

Most frequent topic or technology planned to be disseminated to the logging industry: new timber bridge systems or standards

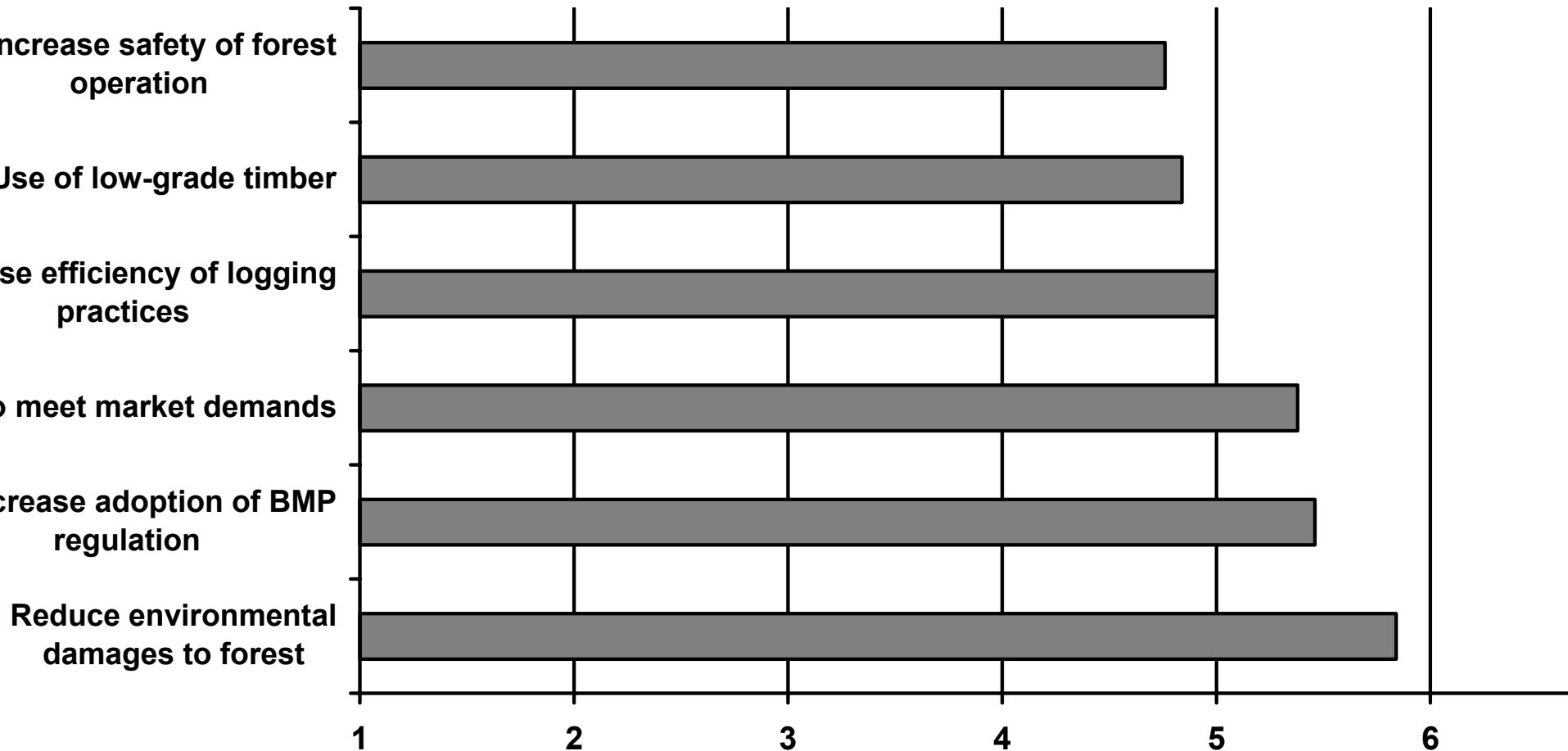
Price ranges for the portable timber bridges designed:

Over \$7,500 (55%), \$5,001 to \$7,500 (33%)

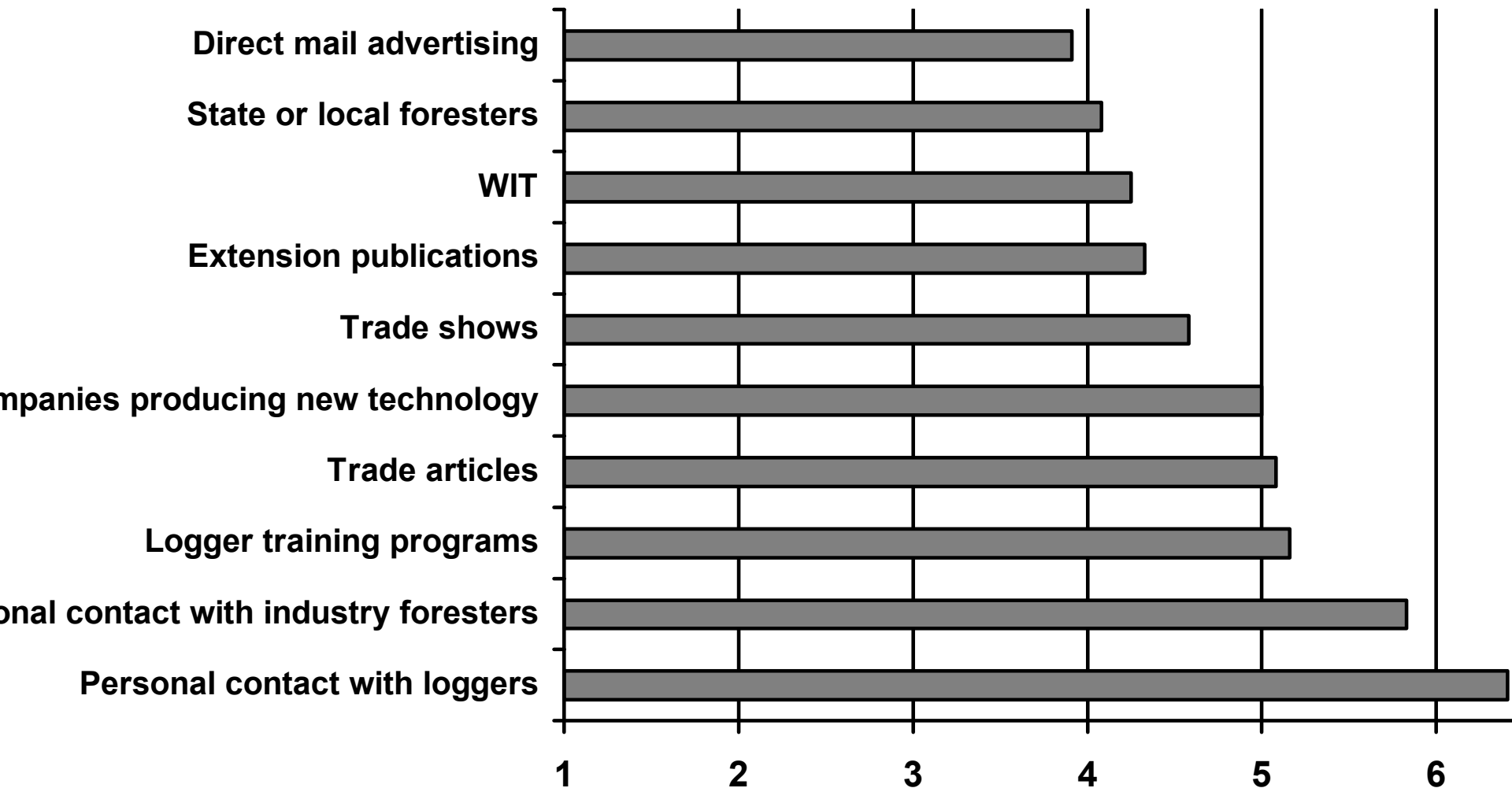
Main factor that encourage developers to design portable timber bridges: providing environmentally sound alternatives for stream crossing

Areas of research needed to be addressed for improving portable timber bridge utilization: light-weight bridges, low-cost design, and better marketing techniques

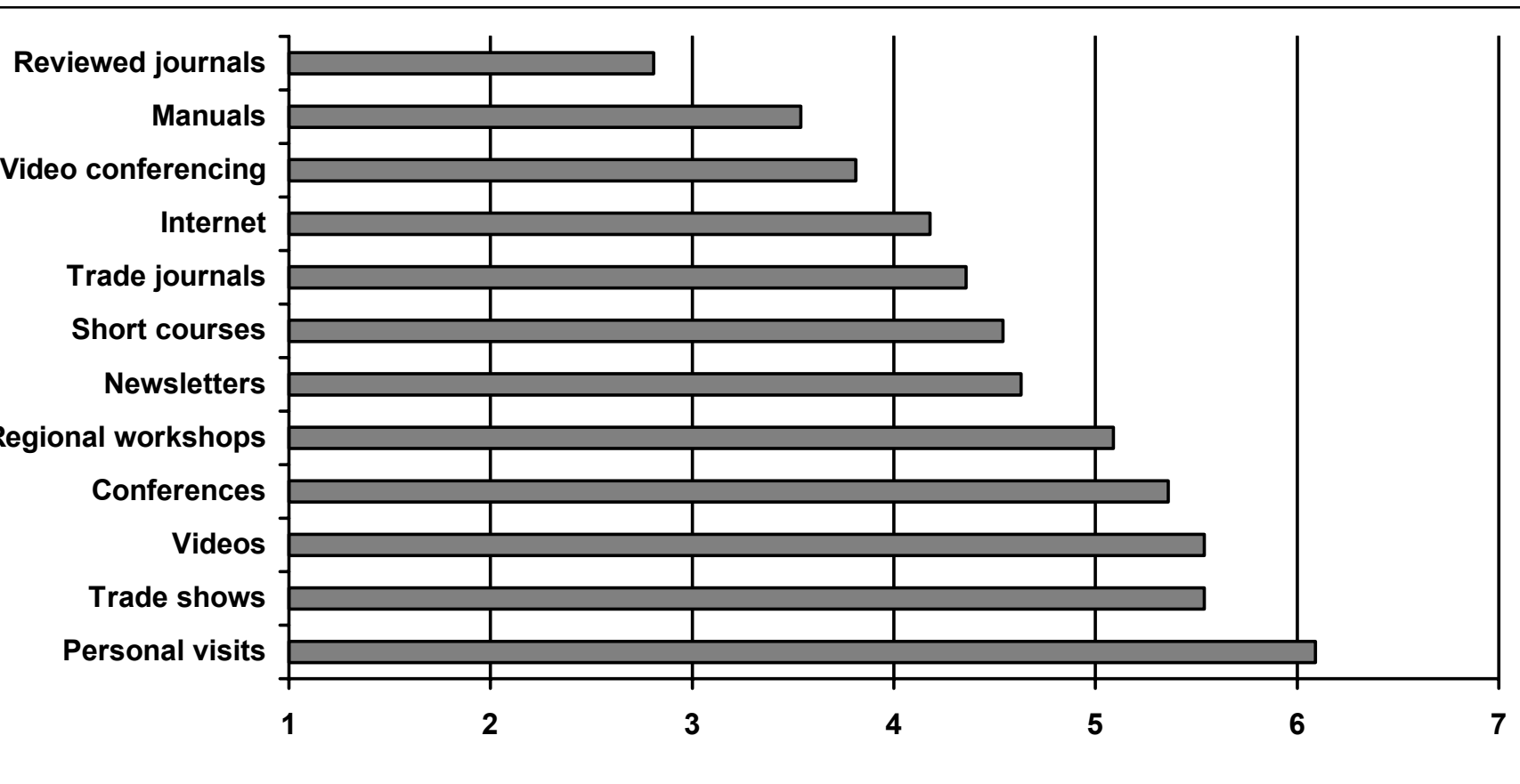
Important Factors Influencing Decision to Provide New Technology Information to Loggers



Information Sources for Dissemination New Information



to Reach Loggers with New Technology Information



Important factors in the decision to use/design/promote portable timber bridge technology (all groups comparison)

Differences in Messages

Factors	Loggers (n=158)	Developers (n=15)	Intermediaries (n=369)	P-values¹
Ease of operation	5.9	6.7	6.0	0.03
Environmental considerations	5.8	5.0	6.1	0.02
Regulations	5.5	4.4	6.1	< 0.01
Low cost	5.4	6.3	5.7	0.13
Availability of product information	4.8	4.7	4.6	0.91

Differences in dissemination of new technology information

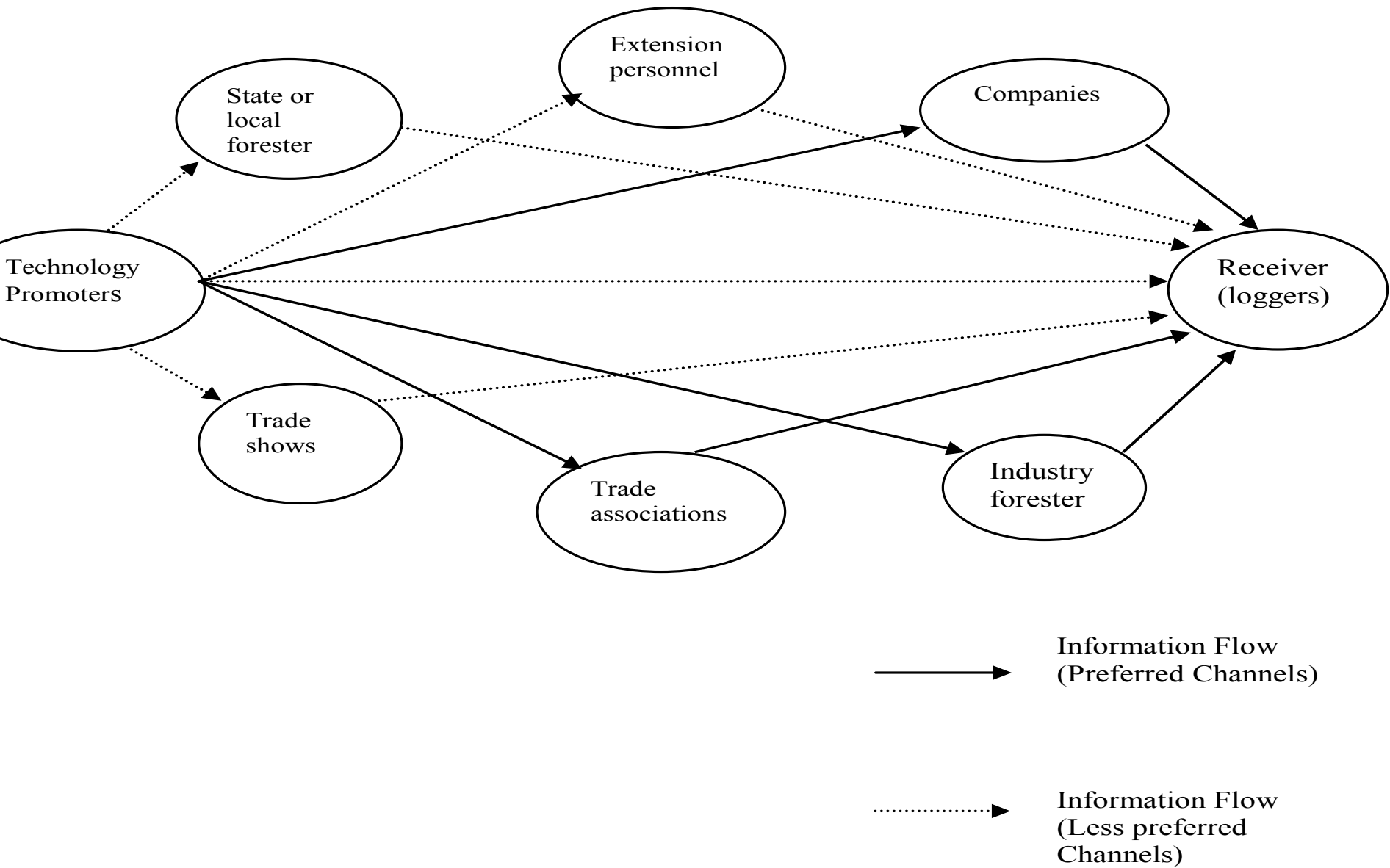
Table 5.12 Effective Methods in Disseminating New Technology Information

Methods	Developers (n=15) [@]	Intermediaries (n=369)	p-values ¹
Personal visits	6.1	5.8	0.73
Trade shows	5.5	5.1	0.08
Videos	5.5	4.7	0.11
Conferences	5.3	4.1	0.02
Regional workshops	5.1	5.0	0.67
Newsletters	4.6	4.3	0.16
Short courses	4.5	4.8	0.61
Trade journal	4.4	4.1	0.38
Internet	4.2	2.8	0.02
Video conferencing	3.8	2.9	0.12
Manuals	3.5	3.7	0.95
Reviewed journal	2.8	3.3	0.44

¹ - Nonparametric, Kruskal-Wallis Test. A asymptotic significance level at $p < 0.05$

[@] - Rating means (scale range 1 to 7) and n = sample size

Information Flow for Technology Transfer in the Logging Industry



Summary

Recommended Strategies:

* Promotional practices:

1. recruit seed loggers (word-of-mouth)
2. field demos
3. Company provide portable bridges for loggers

•Regional differences (loggers)- Tech Transfer methods different in regions – need to identify best method for each region.

•Technology developers need to recognize their audiences. Intermediaries receive and disseminate information differently than loggers.

Acknowledgements

Center for Forest Products Marketing and
Management

Wood In Transportation Program, USDA Forest
Service

Department of Wood Science and Forest Products