

THE EFFECT OF COMMUNICATING *Gliricidia maculata* ON THE BEHAVIOR  
OF INDIGENOUS GARUT SHEEP PRODUCERS IN THE DISTRICT  
OF MAJALENGKA, WEST JAVA

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ABSTRACT

Communication of innovation was a key activity in the study to promote indigenous Garut sheep production to small farmers in the district of Majalengka. *Gliricidia maculata* that was widely grown in rural areas as green fences, but was not used in feeding sheep, was selected as an innovation to be disseminated. The objectives were to improve the farmers' knowledge on this subject and to motivate them to act on one major constraint to sheep production, e.g., nutrition. To attain these objectives, an audio-visual program entitled "Planting and Feeding *Gliricidia maculata* to Sheep" was produced. The program was then presented to the cooperating farmers in four villages in Majalengka, in four consecutive nights, as a part of their training. Tests were given to the participants' prior and after the presentation. About one year after the show, a follow-up survey was conducted. The objective of the survey was to evaluate whether such information created an impact to the farmers' sheep feeding behavior and whether they planted *Gliricidia* tree cuts to secure further supplies. The results pointed out that, first, the cooperating farmers benefited from the *Gliricidia* show. Their knowledge about this subject increased significantly. Second, the follow-up survey demonstrated that the majority of the farmers that attended the show did feed *Gliricidia* tree fodder to their sheep and planted *Gliricidia* tree cuts for further supplies. These findings suggested that sheep producers were receptive to the appropriate information disseminated and used such information in their efforts to alleviate certain constraint to sheep production.

Key words : Communication, *Gliricidia maculata*, Audio-visual program, Farmers' knowledge, Sheep feeding behavior, Indigenous sheep production

INTRODUCTION

Communication of innovation was one objective of the study to promote indigenous Garut sheep production to small farmers in the district of Majalengka. This key activity was deliberately designed to help the local farmers learn about various aspects of sheep production and, therefore, empower them to alleviate certain constraints to their sheep production.

Research pointed out that the overriding constraint in the small ruminant production system in developing countries, that severely curtail high performance of the animal, was feed (Devendra, 1986). In this conjunction, Sabarani, *et al.*, (1982) found

out that farmer in Bogor, Cirebon and Garut of West Java mostly fed natural grasses to small ruminants. Further, Jahi *et al.*, (1989) discovered that most farmers in Majalengka did not feed legume tree fodder to their sheep.

These findings were in line with Devendra's judgment (1990) that shrubs and tree fodder was a particularly neglected and inadequately understood aspect of the feeding systems of ruminants in developing countries.

*Gliricidia maculata*, known locally as *Gamal*, was widely grown as living fences in rural Majalengka. However, despite its nutritional value for ruminants, farmers did not use this legume tree fodder in feeding their sheep. Corresponding to the above

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objective, *Gliricidia maculata* was selected as an innovation to be disseminated. An audio-visual program entitled "Planting and Feeding *Gliricidia maculata* to Sheep" was produced and presented to the cooperating farmers in four villages in Majalengka, in one of their training sessions.

For further investigation, three research questions were formulated: (1) After viewing the *Gliricidia* show, to what extent the farmers gained better knowledge about the subject? (2) After about a year from watching the *Gliricidia* show, to what extent those farmers had changed their sheep feeding behavior and (3) to what extent those farmers had planted *Gliricidia* tree cuts for securing further supplies?

## MATERIAL AND METHODS

### Material

**Communication material.** A sound-slide program entitled "Planting and Feeding *Gliricidia maculata* to Sheep" was the communication material used in this study. It consisted of 52 slide frames and a narration in *Bahasa Indonesia*, recorded in a cassette tape.

Additionally, a Kodak carousel slide projector and a wireless sound system with a built in cassette player were used to present this communication material to the target audiences.

**Target audience.** The target audience of this communication study was four groups of small farmer that were raising

indigenous Garut sheep. They resided in four villages in the district of Majalengka, West Java i.e., Balida, Kadipaten, Pakubeureum, and Sukasari Kidul. The following Table 1 presented the size of the farmer group of each village, which participated in the communication presentation about *Gliricidia*.

Table 1 pointed out that of the four groups of farmer participated in the *Gliricidia* show, the biggest group was the Pakubeureum's, followed by the Balida's, the Kadipaten's and the Sukasari Kidul's. In general, however, their sizes were about equal.

### Communication material production

The production of the *Gliricidia* sound-slide program followed several steps as outline by Kemp (1975). First, doing literature research about technical and socio-economic aspects of *Gliricidia maculata* in greater areas of Bogor. Second, writing a story outline about *Gliricidia*. Third, writing the story line and presenting the manuscript to a panel of communication and subject matter specialists. Fourth, rewriting the story line and making the shooting script. Fifth, doing artwork with drawing artist. Sixth, drawing final colored pictures. Seventh, writing the narration script. Eighth, recording and editing the sound track, and ninth, shooting the slide pictures. Testing the Communication Material. The sound-slide program was tested separately with three groups of audience, representing graduate students in agricultural communication, livestock extension workers and sheep farmers in a village near Bogor.

Table 1. The size of farmer groups participated in *Gliricidia* presentation

Village	Group Size	Percent
Balida	32	26.23
Kadipaten	29	23.77
Pakubeureum	33	27.05
Sukasari Kidul	28	22.95
Total	122	100.00

Suggestions obtained from the students, extension workers and farmers were used to improve the pictures and the narration.

### The Design

Basically, the closest design followed in the conduct of this communication study was one of the three pre-experimental designs, i.e., the One Group Pretest-Posttest Design (Campbell and Stanley, 1966, pp. 7-9). In this study, this design was replicated four times to cover the four groups of farmers resided in four different villages. According to Campbell and Stanley (1966, p. 7), this design was still widely used in educational research. In this study, concern for danger to internal validity due to the effect of *history* could be handled by administering pretest, treatment and posttest in one block of time. The time was relatively short in this study. So, the chance for an uncontrolled event to intervene between the pretest and the posttest, was minimized. Therefore, the effect of *Gliricidia* show on the posttest could be assured.

### Data and Instrumentation

Data required to meet the first objective of this study were two types, i.e., the pretest and the posttest data. A test instrument was developed to gather these two groups of data. The instrument contained 20 items of right or wrong statement for measuring the target groups' knowledge about *Gliricidia* prior to and after exposure to the sound-slide program. To accelerate the target groups' comprehension on the test items, the instrument was translated into Sundanese dialect.

### Testing the Test Instrument

The test instrument was pretested to determine its appropriateness. The pretest involved ten farmers from a village near Bogor. An extension worker familiar with the farmers help the researchers conducted the pretest. The extension workers explained the purpose of the pretest and ask the farmers to respond to every item of the instrument that he had read. The extension worker's and the

farmers' responses and comments were used to improve the wording of the instrument.

### Data Collection

The study was implemented in the third week of February 1993, prior to the beginning of the fieldwork to promote the indigenous Garut sheep production system to the small farmers in the four research sites, in the district of Majalengka. The first presentation was conducted at Sukasari Kidul, a village located about 12 Km south of Majalengka. This meeting involved more than 28 persons.

The meeting occurred at the village hall. It lasted for about one hour from 19:30 to 20:35 PM. Representative of the head of the District of Majalengka Livestock Service and the team leader gave short speech introducing the program and the activity that followed. After that, a Livestock Extension Worker guided the pretest. Then, the *Gliricidia* show was presented to the audience. Right after the show, the participants were ask to do the posttest with the Extension Worker guidance. Total time consumed for the whole activity was about 65 minutes. Twenty minutes for introduction and test explanation, 15 minutes for the pretest, 15 minutes for the *Gliricidia* show, and 15 minutes for the posttest. Similar meetings were conducted in three consecutive nights at the village of Kadipaten, Pakubeureum and Balida. The pattern of activities in these meetings was similar.

### Assessing the Delayed Effect of the Communication Program

A follow-up survey was accomplished in the four farmer's groups in the four research sites, about one year after the *Gliricidia* show. Seventy-one farmers were interviewed in this survey. The objective of the survey was to measure the delayed effects of the communication program on the target group's behavior. In this survey, two farmers' behavior were assessed, i.e., (1) their sheep feeding behavior, and (2) Their *Gliricidia* planting behavior.

Table 2. The small farmers' pretest and Posttest scores about *gliricidia*

Village	Pretest	Posttest	Village	Pretest	Posttest
1. Balida	0	19	3 Pakubeureum	1	16
	6	18		6	17
	:	:		:	:
	13	19		17	20
	19	20		19	20
Mean	14.41	18.41	Mean	14.76	18.41
df = 31; t Stat = -5.53			df = 33; t Stat = -9.27		
P(T<=t)two-tail = 4.65E-06			P(T<=t)two-tail = 1.03E-10		
t Critical two-tail = 2.0395			t Critical two-tail = 2.0422		
Village	Pretest	Posttest	Village	Pretest	Posttest
2. Kadipaten	3	18	4. Sukasari Kidul	1	14
	11	15		9	20
	12	19		11	14
	:	:		:	:
	17	20		17	20
	19	20		19	20
Mean	14.13	17.26	Mean	15.04	19.12
df = 30; t Stat = -7.11			df = 25; t Stat = -7.77		
P(T<=t)two-tail = 4.56E-08			P(T<=t)two-tail = 4.03E-08		
t Critical two-tail = 2.0345			t Critical two-tail = 2.0595		

**Data Analysis**

First, the pretest and the posttest data were analyzed per village, by Student t-Test, Paired Two Sample for Means procedure (Hopkins and Glass, 1978, pp. 233-244). Second, the data about the farmers' sheep feeding and *Gliricidia* planting behavior were analyzed by the Chi-square test for two independent samples (Siegel and Castellan, Jr., 1988, pp. 111-124) and the descriptive statistic procedure. The two groups of data

were analyzed by using the computing facility available at hand.

**RESULT AND DISCUSSION**

**Result**

The Effect of *Gliricidia maculata* Show on the Farmer's Knowledge  
 Table 2 presented the research results

Table 3. Relationship of watching *gliricidia* show and Feeding *gliricidia* tree fodder to sheep

	Watch the Show	didn't Watch the Show	Total
Fed Sheep <i>Gliricidia</i>	59	4	63
Didn't Feed Sheep <i>Gliricidia</i>	8	0	8
Total	67	4	71

$\chi^2 = 2.46; df = 1; p = 0.20$

Table 4. Frequency of feeding *gliricidia* tree fodder to sheep

Frequency of Feeding <i>Gliricidia</i> Tree Fodder	Number of farmer	Percent
Every one or two days	30	47.62
Every three days	23	36.51
Rare	10	15.87
Total	63	100.00

about the effect of exposing the small farmer to the *Gliricidia* shows.

The above Table 2 pointed out that the mean scores of pretest and posttest of the four farmer groups were very highly significantly different, as indicated by the values of t Statistics that were larger than the table values of t Critical two-tail at a given significance level. This indicated that most farmers in the four groups significantly gained knowledge about *Gliricidia*, after being exposed to such audio-visual program.

#### The Farmer's Sheep Feeding Behavior Change

Developing the local resources of indigenous *Garut* sheep required the farmers to alter their sheep feeding behavior. To assess such behavioral change among the farmers, a follow-up survey in the four research sites was accomplished about a year after the *Gliricidia* show. Two aspects of feeding practices were assessed: (1) How many of the farmers that watch the *Gliricidia* show a year ago had provided the legume tree fodder to their sheep, in addition to grass? and (2) How often did they feed this legume tree fodder to their sheep? The results of the survey were in Tables 3 and 4.

Table 3 above pointed out clearly that the majority of small farmers that fed their sheep with *Gliricidia* tree fodder was also those that watch the *Gliricidia* show a year before. As a matter of fact, these two evidences demonstrated that a relationship existed between the two variables. Statistically, this was supported by the insignificant value of Chi-square at an accepted alpha level of 0.05. Further follow-up of these farmers yielded the following findings.

According to Table 4, almost half of the observed farmers provided *Gliricidia* to their sheep once every one or two days, and the rest with lesser frequencies.

#### Planting *Gliricidia* Tree Cuts for Future Supplies

Now, what happened to those farmers that had accepted the *Gliricidia* tree fodder as good feed for their sheep? Were they willing to plant it for securing further supplies through out the year? Data in the following table would answer these questions.

As a matter of fact, the above insignificant Chi square value at an accepted alpha level of 0.05 disclosed a close relationship between the above two variables.

Table 5. The relationship of watching *gliricidia* show and planting *gliricidia* tree cuts

	Watch the Show	Didn't Watch the Show	Total
Plant <i>Gliricidia</i> Tree Cuts	49	4	53
Did not Plant <i>Gliricidia</i> Tree Cuts	10	0	10
Total	59	4	63

$$\chi^2 = 2.57; df = 1; p = .20$$

Table 6. Number of *gliricidia* tree cuts planted

Number of <i>Gliricidia</i> Planted	Number of farmer	Percent
100 cuts or less	47	88.68
101 - 540 cuts	6	11.32
Total	53	100.00

So, it was the majority of sheep producers that watch the show a year before that also planted the *Gliricidia* tree cuts. In this conjunction, further investigation to discover the number of *Gliricidia* tree cuts planted by the farmers was presented in the following Table 6.

The above Table 6 show that the majority of the 53 sheep producers that confessed had planted *Gliricidia*, had planted 100 tree cuts or less, while the rest had planted a lot more cuts for future supplies.

### Discussion

In efforts to promote indigenous livestock resources, researchers could use communication as a means to solve certain problems in the target communities (Lionberger and Gwin, 1982). Through communication researchers could create certain desired effects, including the cognitive, affective and conative effects, that would lead to certain behavioral changes among the target groups (Gonzalez, 1993). In turn, this change would enable the target groups to attain some of their objectives.

In this study, researchers used an audio-visual show about several aspects of *Gliricidia* to inform and to encourage the target groups to utilize the long unused resources in their surroundings. The research findings clearly demonstrated the effect of the show to the small farmers. It turned out that the small farmers with limited formal education were benefited significantly from the audio-visual show. They substantially learned from the *Gliricidia* show and were aware of their potential resources. Since then on, they used the legume tree fodder to supplement a low cost protein source to their

traditional grass based sheep diet. This protein supplement was particularly important to the prolific Garut sheep performance.

The show was deliberately presented two months prior to the Garut sheep provision. In this way, the farmers would have enough time to learn and to have direct experiences in feeding this legume tree fodder to their sheep. So, when they received the Garut sheep, most of them would have enough confidence in the legume tree fodder. Therefore, no more doubt in using it. So, in one way or the other, the show enabled the farmers to overcome the nutrition constraint in the local sheep production.

Further encouraging effect indicated that the target groups began to plant the *Gliricidia* tree cuts for future supplies. This again demonstrated that the target groups picked the useful information and used them for their benefits. If the change processes continued well into the future, undoubtedly the small farmers would improve their sheep production -- an important resource base -- not only to their family economy, but also to the wider rural economy.

### CONCLUSION

The findings of the study and their interpretation suggested the following conclusions:

1. The small farmers learned well-gained practical knowledge and motivation to act on their problems from exposure to the audio-visual *Gliricidia* show. As the results:
2. The small farmers provided *Gliricidia* tree fodder -- the low cost plant protein

supplement – to their traditional grass based sheep diet.

3. The small farmers began to plant the *Gliricidia* tree cuts for securing future supplies.

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