

CALLIANDRA SEED PRODUCTION AND UTILISATION

PROJECTS R6535 AND R6549

REPORT ON A TRAINING WORKSHOP HELD IN
BOGOR, INDONESIA
NOVEMBER 14-16, 2000



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SUMMARY OF A TRAINING WORKSHOP 'CALLIANDRA SEED PRODUCTION AND UTILISATION'

1.0 INTRODUCTION AND AIM

The aims of the joint training workshop between projects R6535 and R6549 were:

1. To highlight recent FRP-funded research results in relation to *Calliandra calothyrsus* seed production and utilization (with special reference to fodder);
2. To provide the opportunity for Indonesian partners to share their experience in relation to *Calliandra calothyrsus* seed production and utilisation; and
3. To identify what type of extension material is appropriate to disseminate the information discussed in 1 and 2 above.

The workshop was organised in collaboration with Mr Jim Roshetko. Mr Roshetko is employed by Winrock International and is seconded to ICRAF in Bogor, Indonesia. The workshop was also supported through the Indonesian Forest Seed Project. A list of participants can be found at Annex 1.

The participants were supplied with a number of materials including:

- Abstracts and information leaflets to accompany each presentation in Indonesian;
- '*Calliandra calothyrsus* production and use: a field manual' (FACT Net, Winrock International);
- Proceedings of the International Workshop on *Calliandra calothyrsus* (FACT Net, Winrock International);
- 'Improving seed production in *Calliandra calothyrsus*: a field manual for researchers and extension workers' (OFI);
- A T-shirt, bag and notepad bearing the sponsors' logos.

2.0 TRAINING PROGRAMME AND METHODS USED

The workshop ran over a period of three days and involved a mixture of presentations, group discussions and a field visit. The workshop programme can be found at Annex 2. The workshop began with an informal session in which the participants could introduce themselves to one another, and express their expectations. This session was followed by an introduction to the FRP-funded work and why the workshop was taking place. The focus of the first day was on utilisation of calliandra, and presentations were made by Janet Stewart (OFI) on the findings of R6549, Budi Tangendjaja (Research Institute for Animal Production, Bogor), I Wayan Karda (University of Mataram) and James Roshetko (ICRAF/Winrock). The second day focused on reproductive biology and seed production, with training sessions by Joanne Chamberlain (CNRD) on the findings of R6535, and a presentation by Nurhayati D: Purwantari (Research Institute for Animal Production, Bogor). These sessions were accompanied by an abstract, or information leaflet. The third day involved a field visit to the Research Institute for Animal Production in Ciawi, just outside Bogor. Discussions were held in a plot of calliandra planted for fodder production, but which may be converted into a seed production area. After returning to Bogor, the material in the new seed production manual was reviewed.

Group discussions were conducted every afternoon, following the day's presentations. The working groups covered three main areas (one for each day) and then presented their results to the whole group:

1. Calliandra utilisation in Indonesia and the identification of knowledge gaps/constraints
Four working groups, one composed of researchers, and three with NGO representatives.
2. Designing seed production areas of calliandra
Three working groups split on a regional basis, i.e. Sumatera, NTB, NTT
3. Needs assessment for new training/extension materials
Three working groups split on a regional basis, i.e. Sumatera, NTB, NTT

3.0 RESULTS OF THE GROUP DISCUSSIONS

3.1 Calliandra utilisation in Indonesia and the identification of knowledge gaps/constraints (Day 1)

There were four working groups for this session, one composed of researchers, and three with NGO representatives.

Researchers

The research group discussed the difference in the results of fodder quality experiments conducted under R6549 and by Budi Tangendjaja (Research Institute for Animal Production, Bogor), and what recommendations should be made to NGOs and farmers. Research under R6549 found that drying calliandra leaves had no adverse effect on the intake of fodder or animal production, however, Budi's group in Bogor found that drying did adversely affect the digestibility of calliandra and animal production. These apparently conflicting results were thought to give a confused message to NGOs and their farmers, so the group discussed why the results of the two experiments may have differed. Two reasons could be found:

1. The R6549 experiments on digestibility involved air-drying at 30°C, whereas Budi's involved oven-drying at much higher temperatures.
2. The animals used under R6549 (in Embu) were not used to calliandra as a fodder (fed either fresh or dry), but Budi's animals had been regularly fed on fresh calliandra, which would tend to give them a preference for this.

The group therefore made the following recommendations:

- Do not allow calliandra fodder to wilt for longer than 24 hrs as the quality may reduce after this time.
- Preferably feed calliandra fodder on the same day as it is cut.
- Do not feed calliandra in a dry pellet form.

NGOs from Sumatera

This group felt that although calliandra was fairly common in Sumatera, the species was under-utilised. Their combined knowledge of calliandra was poor and they were only familiar with it as a source of fuelwood and for honey production. They commented that it was difficult to get seed, despite the tree flowering well. This group was therefore keen for a lot more information on calliandra especially as a source of fodder. They identified, in particular, a need for simple demonstrations of the benefits of feeding calliandra, as well as information on how much calliandra is needed per animal, and how this relates to land requirements. Landholdings in Sumatera tend to be larger than in Java, potentially giving more scope for on-farm planting. In Java, it is usually only possible to plant on boundaries and field corners, with most calliandra being collected from nearby forest areas.

NGOs from Sumatra, Yogyakarta and Flores

Calliandra was known to this group as a source of fodder, fuelwood and green manure, as a nurse crop for other tree species, and as a means of generating income through the sale of seed to a Belgian development project. This group felt that farmers were constrained by a lack of information and planting material, and that research needed to be put into a language that extension workers could understand. The group felt that there should be more research with farmers, economic analyses of systems involving calliandra to facilitate adoption and more information about how to cultivate and manage calliandra, particularly for wetlands and coastal areas. A problem of seed predation by caterpillars was noted, as well as a local belief that handling calliandra could induce 'flu-like' (allergic?) symptoms in humans.

NGOs from NTT and NTB

Calliandra was known to this group as a source of fuelwood, fodder and green manure, as a means of preventing soil erosion, and for income generation through the sale of seed to NGOs. Calliandra is normally found inter-cropped with food or cash crops and in hedgerows, often on very steep slopes (contour hedge spacing 1-2m on slopes steeper than 45°, 6-10m on less steep slopes). Farmers generally harvested calliandra once a year for wood, leaf and seed (it starts seeding after one year). Seed is produced in small seed orchards coordinated by local NGOs. When fed as a fodder it was allowed to wilt briefly (1-2 hours) as otherwise it could cause bloat in goats. Up to 1.5 kg of seed could be collected per tree per year, which could be sold at 6000 Rupiah per kg (US\$ 0.75), although the price varied from region to region. 1 kg of seed is considered to be enough for 1.5 km of hedgerow.

3.2 Designing seed production areas of calliandra (Day 2)

There were three working groups split on a regional basis, i.e. Sumatera, NTB, NTT. Participants from Java were distributed between these groups. Each group was asked to address the following question from the perspective of an NGO:

‘How can farmers in Indonesia develop their current planting systems for calliandra to optimally produce both seed for income generation and fodder for their livestock?’

Each group broadly described a typical farm (size, crops grown, climatic conditions) in their area. The group from NTT felt an appropriate approach would be to develop a demonstration plot for fodder production (involving rows of different tree species inter-planted with different grasses) and get farmers to plant tree fodder species as a requirement of receiving two animals per household on credit. For seed production, they would plant an area close to the NGO office so they could readily manage seed production, processing and distribution. The other two groups described an integrated system of planting for both fodder and seed production on-farm involving fodder banks of calliandra in which every third tree is left uncut for seed production (NTB), or calliandra planted as a border around crop land (Sumatera). The latter group also suggested planting a seed production area on communal land, and the reclamation of degraded land using calliandra. Each group described their planting designs, management regimes, how many livestock they could maintain and how much seed they expected to produce.

3.3 Needs assessment for new training/extension materials (Day 3)

There were three working groups split on a regional basis, i.e. Sumatera, NTB, NTT. Again participants from Java were distributed between these regional groups. Each group was asked to assess information channels, i.e. where do NGOs get information and how do they pass it onto farmers? They were also asked to assess what types of media are most useful for NGOs and farmers, to develop examples of these media, and to prioritise information needs for NGOs and farmers on calliandra utilisation and seed production.

Sumatera

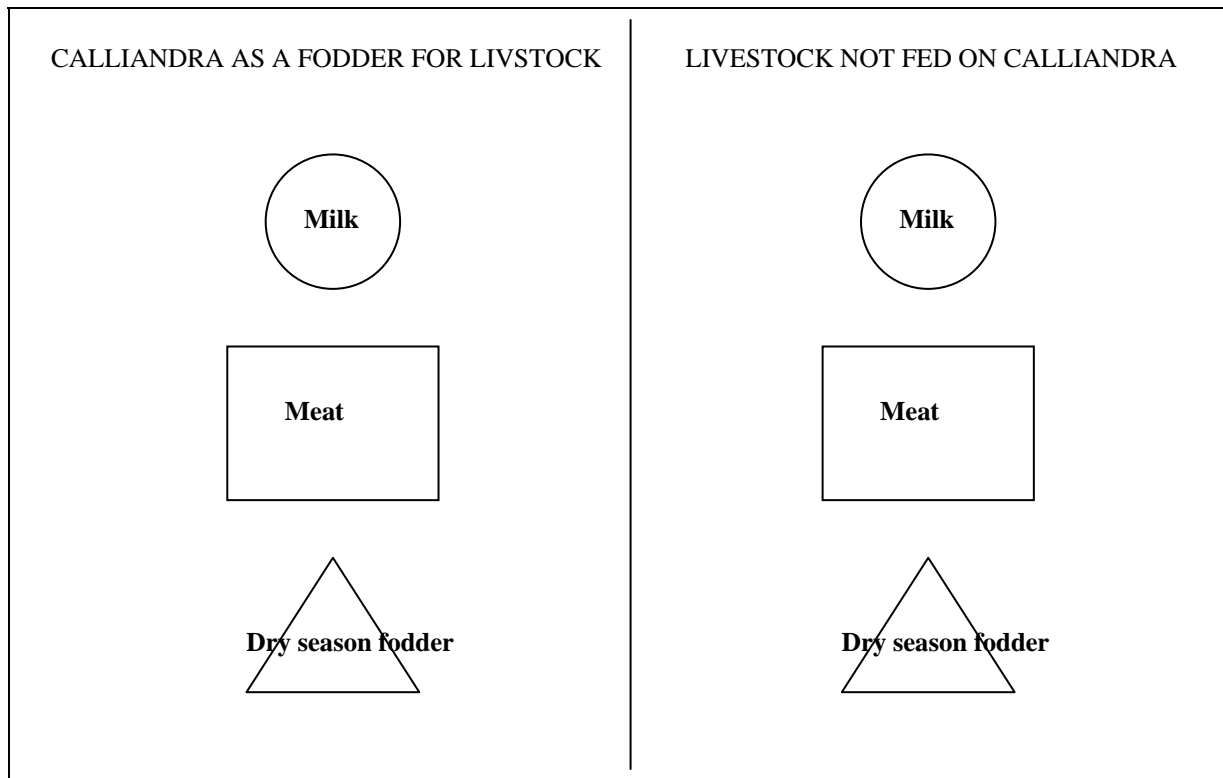
This group felt that NGOs received most of their information from government sources, e.g. forestry seed centres, livestock technical agencies, forestry associations, land conservation service and forestry extension services. Information was then passed from NGOs to farmers via farmer meetings and the development of new information materials.

Media useful to NGOs included field manuals and workshops and their outputs. Media useful to farmers included posters, brochures and leaflets with a simple summary of technical information. The group described their ideas for the posters in more detail. An example, which allows the comparison of raising cattle with and without the use of calliandra, is shown below:

Information needs were prioritised by this group as:

- Managing seed orchards
- Seed quality and handling
- Calliandra fodder and its effects on a variety of livestock
- Calliandra as a fish meal
- The use of calliandra within traditional medicine

Information on seed orchard management is available in the field manual on improving seed production (OFI), and in handouts supplied at the workshop. The latter have been translated into Indonesian, and ICRAF/Winrock, as an activity of the Indonesian Forest Seed Project (IFSP), will translate the field manual into Indonesian. Information on seed quality and handling and fodder production is available in both the Calliandra TFP (OFI) and Calliandra field manual (Winrock). The latter is to be updated and translated into Indonesian under project R6549. To our knowledge, calliandra has rarely been used as a fish meal or as a medicine.

Poster layout

Shapes represent photographs (or diagrams) showing the effect of using calliandra on milk, meat and dry season fodder production. For example, the 'milk' photograph might show a cow with 1 litre of milk without calliandra, but 1.5 litres with calliandra.

NTB

The group gave three examples of information channels between NGOs and farmers from Lombok, Sumbawa and Yogyakarta. NGOs in these areas were felt to be dependent on information from donors and donor-funded projects (e.g. NFTA, Winrock, ICRAF and FADO). A consortium of NGOs based in Lombok was often an important intermediary between the NGOs and donors. NGOs from this region rarely received information from government extension services. Information was then passed from NGOs to farmers.

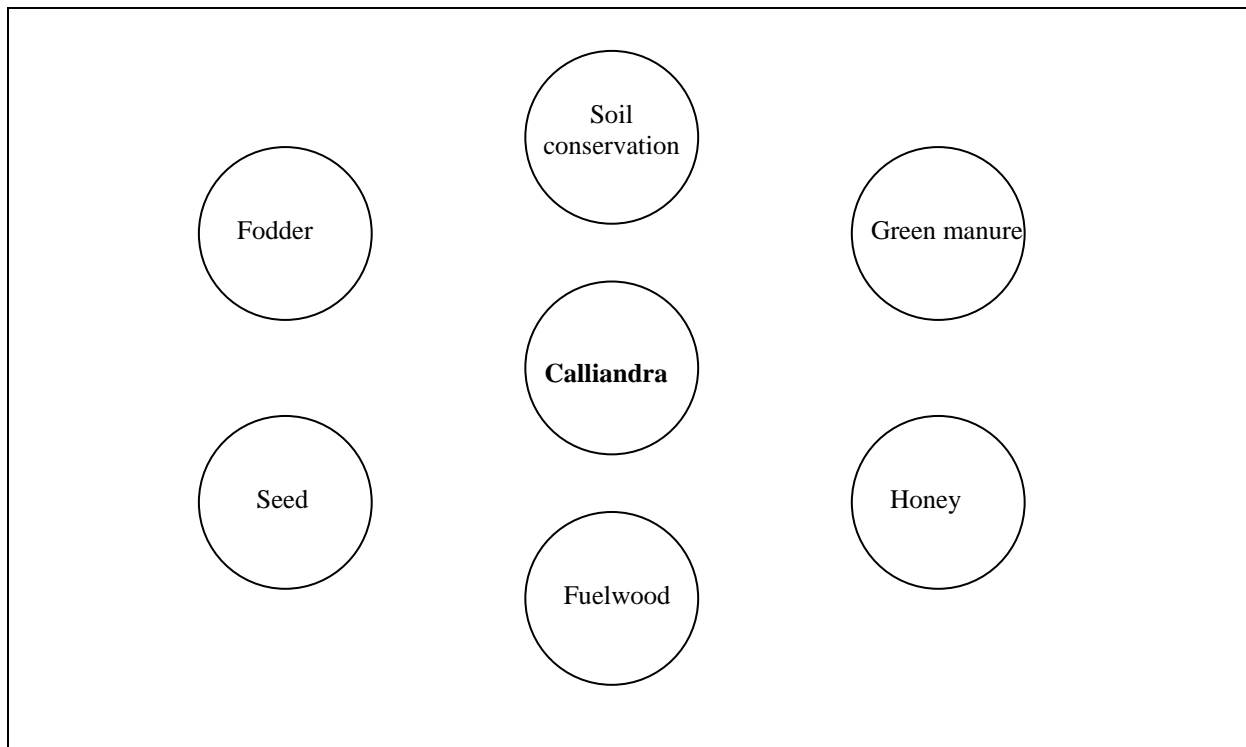
A number of media were cited by this group as useful for farmers and included a pictorial calendar, demonstration plots, slide shows, video and shirts and hats with logos and slogans. The group described the calendar in greater detail. It had a cover page with photographs showing the different uses of calliandra and six subsequent pages. Each page of the calendar contained two months of the year with a photograph and caption describing a function/use of calliandra.

Information needs were prioritised by this group as:

- Seed marketing
- Seed quality and handling
- Calliandra honey production
- Information in Indonesian

Information on seed quality and handling and honey production is available in both the Calliandra TFP (OFI) and Calliandra field manual (Winrock). As stated earlier, the latter is to be updated and translated into Indonesian under project R6549.

Pictorial calendar cover page:



Circles indicate photographs of the different uses of calliandra.

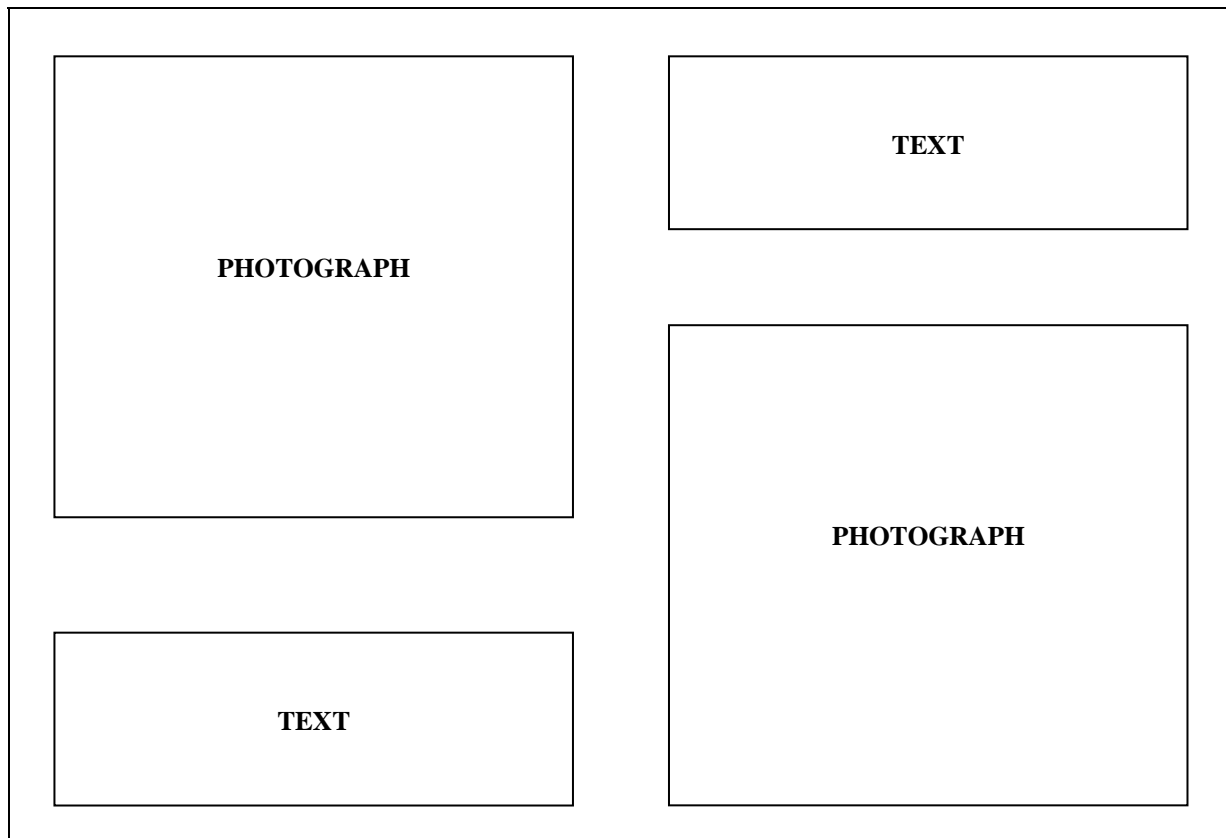
NTT

Information channels identified by this group were similar to those described by the NTB group, i.e. donor to NGO to farmer. Farmers themselves were also identified as a key source of information for other farmers. A number of media were cited by this group as useful for farmers and included slide shows, demonstration plots, brochures and leaflets. The group described in greater detail the type of booklet they felt would be useful to farmers. They envisaged three in a series on the following topics:

- General information on calliandra (cultivation and management)
- Calliandra as a fodder
- Calliandra and honey production

Each booklet would be 8-12 pages in length, and would use a combination of text and photographs with the following layout:

Booklet page layout



4.0 WORKSHOP EVALUATION

4.1 Organisers' comments

The Indonesian organisers selected and invited the participants, who included extension and community workers (mainly from NGOs), and fodder and seed researchers. Approximately 10% of the participants were women. The participants formed a group with a diverse range of backgrounds, but a good group rapport was established quickly.

It was clear from the participants' responses that there was considerable awareness surrounding the use of calliandra for a variety of purposes, however, much of the information discussed (e.g., fodder use, seed production, seed processing and storage) was new to a large majority of the participants. Calliandra seemed to be most well-known as a means of preventing soil erosion on sloping land, especially in the east of Indonesia, or from forest land where the species has been planted as part of 're-greening' programmes.

It was known that some of the participants' English was limited, so a translation service was provided. This seemed to work very well, from the point of view of both the Indonesians and the English speakers. However, we did feel that the language gap limited our facilitation and participation in the discussion sessions.

Additional outputs from the workshop include translation of the field manual 'Improving seed production in *Calliandra calothyrsus*' into Indonesian by ICRAF/Winrock. It has been suggested that a short section on seed processing and on-farm storage is also included in this version, and the list of seed suppliers reflects additional local sources. Permission has also been granted by Winrock International to translate the Calliandra field manual into Indonesian. This will also include an update of the section on fodder and seed production.

4.2 Summary of participants' evaluation

Expectations

The participants' five main expectations for the workshop were as follows:

1. Increase knowledge regarding the management and use of calliandra
2. Increase knowledge of calliandra seed production
3. Increase knowledge of calliandra as a fodder
4. Obtain information that can be used to improve the use of calliandra by NGOs and farmers
5. Develop networks and linkages between organisations working with calliandra

The participants felt they had achieved expectations 1, 3 and 5 without any reservations. Some people felt that expectation 2 on calliandra seed production had only been achieved partially. This may have resulted from the fact that individuals' perceptions of seed production were different, and more information on seed processing and storage, particularly at the farm level, was required. Expectation 4 on calliandra information was also only partially achieved, as many of the participants would have liked all workshop material in Indonesian.

Workshop evaluation

The group as a whole was asked what they liked best about the workshop and how they would improve it if it were to run another time. The following responses were obtained:

What the group liked best about the workshop	How the workshop could be improved
<ul style="list-style-type: none"> • Visiting the field • Discussion sessions • Friendly atmosphere • Good facilities • Participative nature of the workshop • Increase in scientific knowledge • Good time keeping • Many new friends made • Facilitators were experienced • Resource personnel were excellent • Combination of participants was good • Obtained some calliandra seeds • Increased book collections • Increased knowledge of calliandra • Good translation service • Workshop goodies, i.e. T-shirt and bag • Workshop material was satisfactory • Presentations were good • Sharing of experiences 	<ul style="list-style-type: none"> • Workshop schedule sent in advance • More balance between theory and field work • Furniture in a half circle instead of a U-shape • More free time • Farmer visits • Ice breakers • More material in Indonesian • More discussion on other subjects, e.g. honey production, soil conservation • Visits to where calliandra used • Smaller groups for the field visit • Group work written on a handout • More background to the workshop • Needs analysis before the workshop • More presentations from NGOs



Dr Budi Tangendjaja (Research Institute for Animal Production, Bogor) making his presentation on the utilisation of *Calliandra calothyrsus* as fodder for Indonesian ruminants.



Participants examining *Calliandra calothyrsus* and *Zapoteca tetragona* at the Research Institute for Animal Production, Bogor

Annex 1

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Annex 2

Programme Schedule

Time	Activity	Speaker
Day 1 - November 14, 2000		
07:30	Registration of Participants	ICRAF Support Team
08:00	Welcome by ICRAF/Winrock	Jim Roshetko, ICRAF/Winrock
08:15	Introduction Overview of workshop Introduction of participants & sharing of expectations	Jo Chamberlain, CNRD & participants
09:15	Utilization of <i>C. calothyrsus</i> – fodder Recent OFI research results on the use and value of <i>Calliandra calothyrsus</i> fodder	Janet Stewart, OFI
10:15	Break	
10:45	Utilization of <i>Calliandra calothyrsus</i> as fodder for Indonesian ruminants	Elizabeth Wina and Budi Tangendjaja, Research Institute for Animal Production
11:15	Feeding value for small ruminants of the leaf of <i>Calliandra calothyrsus</i>	I Wayan Karda, University of Mataram
12:00	Lunch	
13:30	Utilization of <i>C. calothyrsus</i> <i>Calliandra calothyrsus</i> in Indonesia – an overview	James Roshetko, ICRAF/Winrock
14:00	Identification of current utilization and future research / development needs Working group session Compile information of current utilization practices of <i>Calliandra calothyrsus</i> in Indonesia Identification of knowledge gaps regarding the utilization of <i>Calliandra calothyrsus</i> and areas for future research/development work	Participants Facilitated by Jo Chamberlain, Janet Stewart, Jim Roshetko & Mulawarman
15:00	Break	
15:30	Working group presentations	
17:00	Close	
19:00	Opening Dinner – Restaurant Bale Kabayan, Jl Bina Marga, Bogor	

Time	Activity	Speaker
Day 2 – November 15, 2000		
08:00	Introduction to Day 2 Summary of the days' activities	Jo Chamberlain, CNRD
08:30	Reproductive biology and seed production Reproductive biology: its relevance to seed production of <i>Calliandra calothyrsus</i> and agroforestry trees species	Jo Chamberlain, CNRD
10:00	Break	
10:30	Breeding, sexual and pollination systems and seed dispersal mechanism of <i>Calliandra calothyrsus</i>	Jo Chamberlain, CNRD
11:30	Experience with seed production of <i>Calliandra calothyrsus</i> at the Research Institute for Animal Production	Nurhayati D: Purwantari, Research Institute for Animal Production
12:00	Lunch	
13:30	Seed production and seed orchard design Seed production in <i>Calliandra calothyrsus</i> and seed orchard design	Jo Chamberlain, CNRD
14:30	Working group session Group discussion to explore how seed production areas of <i>Calliandra calothyrsus</i> can be designed to meet the needs of different end users	Facilitated by Jo Chamberlain, Janet Stewart, Jim Roshetko & Mulawarman
15:30	Break	
16:00	Group presentations	Working groups
17:30	Close	
19:00	Dinner (informal) – At Hotel	

Time	Activity	Speaker
Day 3 – November 16, 2000		
	Introduction to Day 3	
07:30	Summary of the days' activities	Jo Chamberlain, CNRD
08:00	Field visit to seed production area for <i>Calliandra calothyrsus</i> to review workshop material	Nurhayati D: Purwantari & Jim Roshetko
10:30	Return to Hotel	
	Introduction to seed manual	
11:00	Review of <i>Calliandra</i> seed production manual and its use in the development of additional training and extension materials	Jo Chamberlain, CNRD
	Needs assessment for new training/extension materials	
11:30	Working group session – <ul style="list-style-type: none"> - Prioritize extension material needs regarding <i>Calliandra calothyrsus</i> utilization and seed production - Develop samples of practical training and extension materials for field workers and farmers 	Facilitated by Jo Chamberlain, Janet Stewart, Jim Roshetko & Mulawarman
12:15	Lunch	
13:30	Continue working group	Working groups
14:30	Group presentation of results from working group session	Working groups
15:30	Break	
16:00	Continue presentations from working group session	Working groups
	Summary and evaluation	
16:30	Assess usefulness of the workshop	
	Closing	
17:00	Comments from CNRD/OFI	Jo Chamberlain, CNRD
	Comments for ICRAF/Winrock	Jim Roshetko, ICRAF/Winrock
	Distribution of certificates	All
19:00	Dinner (informal) – At Hotel	
	Participants depart for home as scheduled	

Annex 3

Participants' intentions following their attendance at the Calliandra workshop

Name	Institution	Location	Farmer sphere of influence	Action plans
NGOs				
Angkut Join	Yayasan Putra Desa	Palembang, South Sumatera		<ul style="list-style-type: none"> To socialise¹ the information of seed production and utilisation of Calliandra: <ul style="list-style-type: none"> At the NGO level At the farmer group level (through farmer meetings) To establish a calliandra tree planting trial To share information with other NGOs (YPD, Kesmada, Watala, and Yabima)
Dwi Berta		Padang, West Sumatera	150 farmers	<ul style="list-style-type: none"> To discuss the information on seed production and utilisation of calliandra with other NGOs To discuss and socialise the information with farmers To try collaboration with local universities and companies to utilise abandoned land for planting calliandra
Ester Lestariningsih	Yayasan Bimbingan Mandiri	Lampung	30 farmer groups	<ul style="list-style-type: none"> To socialise the utilisation of Calliandra in: <ul style="list-style-type: none"> Group meetings Mix farming training courses NGO networks Government institution of husbandry Other meetings (formal and informal)
Fransiska Rengo	Yayasan Wahana Tani Amndiri	Paga, Flores	1521 farmers	<ul style="list-style-type: none"> To socialise the information from the workshop to other staff in WTM To continue the activities of seed garden both for fodder and seed production To carry out a trial of utilisation of calliandra for cattle
Helmi Nawawi	Yayasan Kesmada	Ogan Komering Ilir, South Sumatera	500 farmers	<ul style="list-style-type: none"> To transfer the information to other staff members To socialise the idea of using calliandra in farmer group meetings To socialise the advantages of calliandra for fodder Transfer the information to others NGOs in South Sumatera Establish a demonstration plot Share the ideas with experienced NGOs
M. Sunarto	PSPSDM	Mataram, NTB	120 farmers	<ul style="list-style-type: none"> To transfer the information to farmers' groups in regard to the: <ul style="list-style-type: none"> Utilisation of calliandra Establish demonstration plot in farm land Develop planting of calliandra for soil conservation, fodder production, and seed production
Purnomo Prabowo	Wana Mandhira	Yogyakarta	9 farmers groups (100 farmers)	To use the information in considering our previous activities in conserving and developing natural resources through economic and environmental education

¹ Socialisation¹ means to share information with farmer groups or the wider community. This process could be as simple as reviewing the material, or proactively promoting the material.

Rama Zakaria	Watala	Lampung	20 farmers	<ul style="list-style-type: none"> To socialise the information to farmer groups To socialise the information through our network
Thomas Neru	PNT-GTZ Waingapu	Waingapu, Sumba	8000 farmers	<ul style="list-style-type: none"> To share the information with motivator/field staff To collect other relevant information (cultivation/technical aspects of planting calliandra) and sharing the information to the farmer groups To collect calliandra seed from the farmers and establish a demonstration plot (0.5 ha)
Tom Dierolf	HPI	Sumatera	No farmers, work through NGOs	I will meet with partner NGOs that attended the workshop (YPD, Yabima, LP2M, and Kesmada) to determine what we will do next as a follow up. I think that we'll probably start by planting some calliandra and develop a farmer training module that focuses on forage tree legume (including calliandra) as a source of feed to supplement grasses. This will be followed up by training that will be a part of smallholder livestock projects.
Umar	LPA	Yogyakarta	100 farmers	To transfer the information and try to establish a demonstration plot in farm land.
Vinsen Simao	Yayasan Tananua Timor	Kupang, Timor	1618	<ul style="list-style-type: none"> To socialise the information to the farmers through farmer meetings and media information To socialise the information to other staff of Tananua Share the information to the NGO network
Witardi	LP3ES	Mataram, Lombok		<ul style="list-style-type: none"> To determine target adopters of the existing farmer group To identify farmer group needs Positioning the product To determine appropriate media to transfer the information To determine channels of information distribution through the existing network To collect feedback from the farmer groups and to determine the method/strategy for promoting calliandra utilisation (trials, field visit for example)
Zainal Arifin	LPMP	Dompu, Sumbawa	1900 farmer	<ul style="list-style-type: none"> To socialise the information to other staff To transfer the information to the farmer in each location and collect other information from ICRAF/Winrock and OFI To establish a demonstration plot
Researchers				
Elizabeth Wina	BPT (Center for Animal Research)	Bogor	-	<ul style="list-style-type: none"> To increase seed collection activities in the Research Center To distribute the seed to the Province Research Center which directly works with farmers
Iman Budiman	BPTH (Forest Tree Seed Center)	Palembang	-	<ul style="list-style-type: none"> To transfer the information to other BPTH staff To use the information as a source of training material for farmers
Aep Riskendarsyah	BPTH (Forest Tree Seed Center)	Bandung	-	<ul style="list-style-type: none"> To submit a proposal to Perum Perhutani (State Forest Company) for planting calliandra as an understory with a Sengon (<i>Paraserianthes falcataria</i>) seed orchard To transfer the information to Governmental Institution for Regreening and Soil Conservation

Bambang Risdiono	BPT (Center for Animal Research)	Garut, West Java	100 farmers	<ul style="list-style-type: none"> Information will be used for future research activities such as: <ul style="list-style-type: none"> Adaptation of Calliandra to various environments Feeding trials Competition between calliandra and food crops
Endang Sutedi	BPT (Centre for Animal Research)	Ciawi, West Java		The information will be used as reference for future research
Wayan Karda	Faculty of Animal Science, University of Mataram	Mataram, NTB	20 farmers (4 groups)	<ul style="list-style-type: none"> To conduct a seminar in the faculty on utilisation of calliandra for fodder and honey production To plan a calliandra plantation in the border experimentation farm for fodder and seed production For honey production, calliandra will be planted on farm land To socialise the idea to the farmer
Sajimin	BPT	Bogor, West Java		To use the information to design tree plot trials for seed collection
Emmy Gratiana	BPTH	Denpasar		<ul style="list-style-type: none"> To provide the information in data base To provide technical assistance for NGOs in NTT/NTB which produce, supply, and sell calliandra seed To ask the NGOs to send their seed for seed testing to BPTH Denpasar To submit a proposal to IFSP/ICRAF for establishing Seed Source/Seed Orchard Trials so that high quality of seed can be produced To inform the NGOs about seed quality testing