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~~Forages~~ For Smallholders Project – Phase II

Developing Sustainable Forage Technologies for Resource-Poor Upland farmers in Asia

Six-Monthly Report

1 January – 31 July 2000



Evaluating legumes as ground cover on a hilly farm in Tuyen Quang, Vietnam.



Technical Assistance for Agricultural and Natural Resources
Research at the CGIAR Centers RETA No. 5866.

Summary

The Forages for Smallholders Project – Phase II, funded by the Asian Development Bank, commenced in January 2000 with the first large activity being an Inception Meeting with the FSP country co-ordinators from Indonesia, Lao PDR, Philippines, Thailand and Vietnam to discuss the goals and to plan activities for the next three years. Momentum has picked up rapidly since then. This was possible because of the solid groundwork achieved in Phase I funded by AusAID.

Development of productive and sustainable forage technologies

Farmers who had already planted improved forages previously, had expanded the areas planted in the first half of 2000, in all countries. Many reported that they did so because the forages saved time in gathering feed at times when there was a great demand on labor. As livestock numbers increase they have to go far afield to obtain a supply of natural grasses. Others reported when cattle were repeatedly fed planted forages, they developed better body condition and fetched more money in the market. In Hue, Vietnam, farmers had recently been deprived of an important source of income from growing sugarcane, and are now turning to cattle fattening to help them to sustain their livelihood. In the Philippines and Indonesia, the FSP project complements government distribution programmes of livestock. The improved breeds of cattle, buffaloes and goats they receive are potentially more productive, but only if they are provided with higher quality forage and if they have enough of it throughout the year. With improved forages farmers are obtaining better growth rates of these cattle and goats, and milk production from buffaloes.

The initial interest of many farmers is to plant grasses, as they grow fast and provide large quantities of forage. However, as farmers become more experienced, they also realise the importance of legumes in the livestock diets. In Daklak, Vietnam, farmers are intercropping stylo in coffee and introducing arachis in natural grasslands. In Thailand, dairy farmers are managing intensive sown pastures to maintain a high content of *Stylosanthes hamata* as they recognize its value in milk production. In China, Indonesia, Laos, Philippines, and Vietnam seedlings of various fodder tree species are being raised in nurseries for planting on-farm. In China, several accessions of stylo were screened for anthracnose resistance and one early flowering; accession GC1579 turned out to be the most resistant.

During several visits it became obvious that women farmers play a considerable role in the management of cattle. This is not always recognised or given sufficient attention by the government services. An MSc student from France has arrived to assess the role of gender in adoption of forage technologies in Cagayan de Oro, Philippines.

Extension of forage technologies

In addition to expanding forages in the focus districts, activities have been initiated to extend improved forage technologies to other districts. The first step has been to define where there is a need and demand. Thirty participatory diagnoses and participatory plannings have been carried out in new districts or municipalities of the different countries. Every exercise involved 20 to 40 farmers. Problems within the farming system, and particularly within the livestock component, were identified with farmers and solutions were discussed. Where there was a need, activities for evaluating forages and adapting forage technologies were planned with the farmers. Reports of these participatory diagnoses are available in English or local languages.

In Indonesia, new farmers organized groups to establish communal multiplication plots at the same time or even before planting on their own farms. They had heard the positive stories during cross visits to groups of experienced farmers, and were confident enough to invest a significant amount of communal effort. In Bukidnon, Philippines, the FSP team chose an institutional approach for dissemination from the focus municipality, Malitbog. This was because it was necessary to go to a higher level to ensure cooperation. This required several visits and meetings with the staff of the Regional Department of Agriculture, Mayors, Municipal Officers as well as farmer groups in new municipalities. However, following these visits, it is expected there will be no barrier to spread of new fodder technologies through the province, facilitated by the highly motivated extension workers that we met in the field and who have since received training.

The establishment of effective multiplication systems

Farmers in several countries have started to produce vegetative propagation material of improved grasses for distribution to other farmers. In most cases the project buys from individual farmers and farmer groups for free distribution to farmers in new districts. In other cases, where spontaneous spread is occurring, farmers are beginning to pay for vegetative planting material. Core farmers in the new areas become providers of planting material to other farmers. It is an effective way of multiplication and it is essential to plan for this activity to ensure successful dissemination of forages to new areas. The number of cuttings produced by farmers in different countries this year amounts to several hundreds of thousands of cuttings.

The production and sale of legume seeds by farmers is beginning slowly. One of the limitations has been that varieties do not flower early enough to set seed while there is moisture or warm weather. China has assessed varieties of stylo for early flowering and cold tolerance and this material will be evaluated across the region next year.

Thailand has produced 400 kg of seed of various grass and legume species for distribution to other countries. In Laos, 5000 cuttings of gliricidia were produced for the establishment of live fences on-farm.

Strengthening capacities

An international workshop “Analysing Gender and Interest Groups in Agricultural and Natural Resources Management Research” was held at Hanoi, from 20 – 25 March 2000. Thirty-one FSP collaborators from Vietnam, Laos, Thailand, Indonesia and the Philippines attended. Seventy-four technicians and researchers were trained in forage technologies and participatory research during courses conducted at Daklak (Vietnam), Tuyen Quang (Vietnam), Indonesia and Philippines. Field days and cross visits were organised to train farmers.

Networking for sharing information

All FSP country coordinators established effective email communication systems, which is facilitating communication and exchange of electronic documents. A new issue of the newsletter SEAFRAD was published and distributed to 391 readers in all participating FSP countries.



Farmer feeding leaves of an indigenous species, *Bauhinia* spp., collected from forest reserve, Xieng Ngeun district, Luang Phabang province, Lao PDR.

Project background.

The project "Developing Sustainable Forage Technologies for Resource- Poor Upland Farmers in Asia", RETA No. 5855, called, "Forages for Smallholders Project (FSP) – Phase II", started in January 2000. It is funded by the Asian Development Bank for a period of three years under the Technical Assistance for Agricultural and Natural Resources Research Program of the bank for CGIAR Centers. The goal of the project is: "to improve the livelihood of upland farmers by enhancing available feed sources to increase livestock production and strategic use of grasses and legumes to conserve soil and to enhance nutrient management (Asian Development Bank, 1999). Participating countries are China, Indonesia, Lao PDR, Philippines, Thailand and Vietnam.

Objectives and outputs

The objectives are:

- Develop sustainable forage technologies for resource-poor farmers in upland farming systems in Asia
- Strengthen the capacity of National Agricultural Research Systems in the Bank's Developing Member Countries (DMC's) to develop and deliver these technologies to farmers.

The expected outputs are:

1. Productive and sustainable forage technologies for upland farming systems developed and tested by farmers.
2. Forage technologies extended to other farmers using participatory approaches for scaling-up from farm level to the community and provincial levels.
3. Effective local seed and planting material multiplication systems established and operational.
4. Capability in DMCs for developing and disseminating forage technologies using farmer participatory approach (FPA) strengthened.
5. Network for sharing information among NARSs and in the region continued based on the Southeast Asia Feed Resources Research and Development (SEAFRAD) Network.

FSP – phase II is co-ordinated by the Centro Internacional de Agricultura Tropical (CIAT), which is part of the Consultative Group on International Agricultural Research (CGIAR). The implementing agencies in the participating countries are:

| | |
|-------------|--|
| China | Tropical Pasture Research Centre (CATAS), Hainan. |
| Indonesia | Dinas Peternakan, Samarinda, East Kalimantan and Directorate General of Livestock Services (DGLS), Jakarta. |
| Lao PDR | National Agriculture and Forestry Research Institute (NAFRI), Vientiane. |
| Philippines | Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD), Los Baños, and Department of Agriculture, Region 10, Mindanao. |
| Thailand | Department of Livestock Development, Ministry of Agriculture, Bangkok. |
| Vietnam | National Institute of Animal Husbandry (NIAH), Ministry of Agriculture, Forestry and Fisheries, Hanoi. |

The project worked at 12 focus sites in the first six months of 2000 (table 1), 10 of which had been developed in the FSP – Phase I, funded by AusAID.

Table 1. Focus sites in phase II of FSP and their dominant farming system

| Country | Province | Focus district/ municipality | Dominant farming system |
|-------------|--------------------------------|---------------------------------|--|
| Indonesia | East Kalimantan | Makroman, Samarinda | Rain fed lowland, intensive sedentary upland. |
| Lao PDR | Luang Phabang Xieng Khouang | Sepaku II, Pasir | Extensive sedentary upland, grasslands. |
| | | Xieng Ngeun Pek | Short rotation slash and burn. Short rotation slash and burn, intensive sedentary upland (rice), grasslands |
| Philippines | Savannakhet | New site | Grasslands |
| | Misamis Oriental | Cagayan de Oro | Extensive sedentary upland. |
| | Bukidnon | Malitbog | Extensive sedentary upland. |
| Vietnam | Daklak | M'Drak | Extensive sedentary upland, grasslands |
| | Tuyen Quang | Tuyen Quang | Intensive sedentary upland. |
| | Thua Thien Hue | Xuan Loc | Intensive sedentary upland, short rotation slash and burn. |
| Thailand | Nakornratchasima | Sung Nuen | Extensive sedentary upland. |
| China | Hainan | New site | Extensive sedentary upland. |

Achievements by output

Development and testing by farmers of productive and sustainable forage technologies for upland farming systems.

Vietnam

M'Drak. Many farmers increased their areas under forages, some from 0.1 ha to 2 ha. Ten farmers have started to grow stylo 184 as a cover crop in coffee and are interested in producing seeds of stylo. Three more farmers are planting arachis, stylo and some grasses in strips in native grassland. Five farmers planted the fodder trees gliricidia and flemingia as soil erosion barriers. Other farmers are evaluating the legumess arachis, desmanthus, vigna, and centrosema. An experiment of introducing arachis into natural grazing land was started.

A PhD student will carry out research to determine the production capacity of natural grasslands and the opportunities for introduction of legumes in those grasslands.

Tuyen Quang. Farmers are continuing to expand the use of *P. maximum* and *P. atratum* for feeding to fish. Some farmers are now increasing areas of planted grass and legumes for fattening and breeding cattle. Five farmers are evaluating legumes for ground cover and 8 farmers have introduced shrub legumes. There is opportunity to investigate the complementary role of forest land assigned to farmers with that of planted forages, taking into account the role of indigenous feeds.

Thua Thien Hue. A workplan with farmers was developed for continuing evaluation of forages. A report on feeding legume trees was written.

Indonesia

Makroman and Sepaku II. Farmers have started to raise seedlings of the fodder tree *retalhuleu* in nurseries and planted them on-farm. Farmers are continuing to plant forages along contours for fodder production and erosion control. Some farmers are experimenting with vegetative propagation of stylo. If this type of propagation turns out to be successful, it would be a breakthrough as an alternative to the problematic seed production of stylo in East Kalimantan. Participatory monitoring and evaluation exercises were conducted. Farmers concluded that the condition of cattle improves after eating improved forages and that they therefore fetch better prices in the market. Another outcome of the evaluation was that growing of forages saves labour.

Philippines

Malitbog. Thirteen farmers in 5 villages established fodder hedgerows on-farm for erosion control. Meetings were held to assess the impact of forage technologies.

Cagayan de Oro. Farmers at the focus sites expanded the area planted with forages and increased the number of feed resources used. *Calliandra* seedlings were raised and planted on-farm. Multiplication of *leucaena* K636 has started. One farmer earns money by producing seeds of *desmodium*, *desmanthus* and *centrosema*.

China

On-station. Four on-station experiments for the development of forage technologies have been established in Hainan, Guangdong and Guangxi provinces. The research is focusing on selection of early flowering and anthracnose resistant stylos and evaluation of a range of shrub legumes. New stylo accessions, GC1579, GC1480, GC1576, GC1524, GC1528, GC1557, E9, CPI18750A, GC1578, E7 (90038) were screened on-station for anthracnose resistance and early flowering, GC1579 being the best one. A new stylo accession evaluation trial started in April 2000, using stylo 184 as a control. An experiment for shrub legumes introduction and evaluation started in 1999 at CATAS, Hainan. Thirty-seven accessions are from CIAT, Colombia and 22 from China. The results show that *Cratylia argentea*, *Desmodium velutinum*, *Flemingia macrophylla*, *Leucaena leucocephala* K636, *Gliricidia sepium* are the most promising species and varieties. The shrub legume research is being directed at feeding goats. While 4-5 mu (1 ha =15 mu) of

natural forage is required for feeding one goat, 0.5-1 mu of improved forage is sufficient. *Cratylia argentea* has high leaf yield and quality, and is very palatable for goats (and rabbits).

An on-station experiment on the evaluation of forages in Dianbai, Guandong Province, started in April, 2000. Twenty accessions of grasses, herbaceous and tree legumes are being evaluated. *Brachiaria decumbens*, *Panicum maximum*, King grass, Stylo Reyan 2, *Cratylia argentea*, *Leucaena leucocephala* K636 are growing vigorously.

Preparations are being made to commence Farmer Participatory Research near Danzhou and Le Dong counties, Hainan. The main problems in Nanfeng and Yaxin, Danzhou, are lack of forage during the dry season and poor quality forages. The main problems in Zhizong, Ledong, are also poor natural grasses, low productivity, and lack of forage during the dry season. Ten farmers from Nanfeng and Yaxin communes and 10 farmers from Zhizong commune have received seeds and seedlings of 8-10 species for evaluation.

Laos

Participatory planning was done at the end of the dry season with all farmers in order to plan the time most suitable for them to plant forages, what species, and how large an area that they want to plant. Most farmers continued to plant forages but some stopped as they were resettled in other provinces. Most of these farmers like planting *Panicum maximum* TD 58, *Brachiaria brizantha* CIAT 6780, *Brachiaria decumbens* cv. Basilisk and *Stylosanthes guianensis* CIAT 184. Farmers use these species by cut and carry for feeding cattle and buffaloes in the dry season. Some farmers have started planting *Stylosanthes guianensis* for pigs.

Five tree demonstration plots were established in Luangphabang and 6 in Xiengkhuang. *Leucaena* and calliandra were planted in these plots to demonstrate the benefits of these trees to farmers. There are some farmers showing interest in planting trees for fallow improvement.

A visit was organised from Chomphet, Luangphabang province to Xiengkhuang for exchanging experiences on PE with staff from Xiengkhuang. Another trip was made to Luangphabang to work on the gliricidia nurseries on-farm.

Thailand

Ten farmers have expanded their area planted with *Brachiaria sp.* and *Paspalum sp.* and 9 farmers started to experiment with new legume species.

Evaluation was begun of a new collection of Lablab spp. obtained from ILRI and CSIRO. Lablab has potential for use in mixed crop-livestock systems for use as animal feed and soil improvement.

Extension of forage technologies to other farmers using participatory approaches for scaling-up from farm level to the community and provincial levels.

Vietnam

M'Drak. Participatory diagnoses were carried out in Ea Kar and M'Drak Districts as first steps towards scaling-up. It involved 6 new villages (communes) and 200 farmers.

Tuyen Quang. Four new communes were selected and secondary data were collected about these communes. Two days of cross visits were organised for the farmers in these communes, and participatory planning was carried out. Thirty-eight new farmers planted forages.

Indonesia

Three new districts were identified and 4 participatory diagnoses and planning meetings have been conducted. At the focus site, Makroman, one field day was conducted for new farmer groups. Interviews were organised with the media about FSP; two interviews were broadcast on the radio and one was shown on television.

Philippines

Bukidnon. Links with the Department of Agriculture of Region 10 were established to facilitate the institutionalisation of dissemination of FSP activities. Participatory diagnoses and planning meetings were conducted in 6 new sites in Malitbog involving 76 new farmers. Meetings with Mayors, Agricultural Officers and farmer groups were organised in four new municipalities to assess the opportunities of expanding FSP activities in those municipalities. There are good opportunities in all municipalities.

Cagayan de Oro. Participatory diagnoses and planning meetings were conducted with 4 farmers groups. Field days were organised and informal training was given to core farmers. Several new farmers have started to plant forages. Five cross visits were organised for 105 new farmers visiting the focus sites.

China

Mrs. Li Yuyuan and Wu Meiyan are conducting a survey on natural conditions, population, land-use, and agricultural data, organisations and services in Guangxi province. Two or three communes and some farmers are being selected for forage evaluation. Shrub legume seeds of 6 accessions have been distributed for planting.

Laos

Participatory diagnoses have been conducted in 6 villages; 3 in Xiengkhuang and 3 in Luangphabang. As a result of the participatory diagnoses, 3 villages have been selected where most of farmers in these villages are facing feed shortage in the cooler months. The result of participatory diagnosis has been documented. About a hundred new farmers have planted forages this year.

Thailand

Secondary data were collected for new sites in Dan Kun Tod and Pak Chong Districts.

The establishment of effective local seed and planting material multiplication systems.

Vietnam.

M'Drak. Ten farmers have developed multiplication plots and sell cuttings and tillers of forages to other farmers. Five farmers produce seeds of stylo 184, guinea, and brizantha. They have realised the potential of these plots and are investing in it in terms of labour and application of fertiliser.

Tuyen Quang. Seven farmers are producing and selling vegetative planting material and three farmers have started to grow legumes for seed production. Three thousand cuttings of forages were produced by farmers and distributed to new farmers. Fifteen kg of forage seed was obtained for distribution to new farmers.

Thua Thien Hue. Twenty kg of seeds was obtained for distribution to new farmers. Farmers have started to share vegetative planting materials.

Indonesia

Two farmers groups in the focus sites have produced vegetative planting material for sale. The groups sold 60,000 cuttings through the project to new farmers, and private farmers sold another 100,000 cuttings. Two new multiplication plots were established in the new sites.

Philippines

Bukidnon. New forage multiplication plots were established in 5 sitios. Eleven kg of seeds of stylo 184 was obtained.

Cagayan de Oro. Seed production of calliandra, and leucaena K636 has started on-station. Three farmers were identified who were willing to establish multiplication sites for grasses.

China

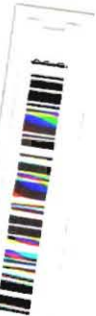
Seven species and varieties including *Cratylia argentea*, *Desmodium velutinum*, *Flemingia macrophylla*, *Leucaena leucocephala* and *Acacia spp*, *P. maximum*, *B. decumbens*, *B. brizantha*, *P. atratum*, *Melinis* were planted in Danzhou and Ledong for seed production in April. Ten promising new stylo accessions with high yield or early flowering were planted in April for seed production in Danzhou. Seed was produced of *P. maximum*, *B. decumbens*, *B. brizantha*, *P. atratum* and *Melinis sp.* in Danzhou and Le Dong.

Laos

Gliricidia from 5 plots, that were planted 2 years ago, was pruned and produced 5000 cuttings. The cuttings were distributed to 22 farmers in Xieng Ngeun district, Luangphabang province, who will use them to establish live fences.

Thailand

Seeds of promising brizantha accessions and legume species were made available to farmers in Sung Nuen.



Strengthening of capability in DMCs for developing and disseminating forage technologies using farmer participatory approach (FPA).

Vietnam.

M'Drak. Six cross visits were organised involving 200 new farmers who visited farmers at the focus sites. One hundred and thirty-eight farmers in 7 villages were trained in forage management, and practised sowing of forages. A booklet was developed for farmers about management and utilisation of 4 forage species, and was distributed to 200 farmers. Another training course for 30 farmers was conducted on livestock management and nutrition. A training course on "Developing forage technologies with farmers" was conducted in M'Drak for 17 technicians, researchers and extension workers, from 5 to 10 June 2000.

Tuyen Quang. Three extension workers were trained in forage husbandry. Seventeen people from the province, districts and communes will be trained in communication, participatory diagnosis and forage technologies on 23 July 2000.

Thua Thien Hue. Farmers were trained in the use of legume trees as supplementary feed.

Indonesia

A 2-weeks course on forage agronomy, management and participatory research was held at Samarinda from 20-29 June 2000, for 15 extension workers from East Kalimantan.

Philippines

Bukidnon. A training course on forage agronomy, management and participatory research will be conducted for 25 technicians, officials and scientists at Malaybalay, from 17-28 July 2000.

Cagayan de Oro. Four informal training activities were organised involving 88 farmers. They were trained in forage technologies and animal nutrition.

Laos

Training sessions on participatory diagnosis were conducted in Luangphabang and Xiengkhuang where 7 district staff attended.

Thailand

Informal training on forage establishment, management and utilisation was conducted for 10 farmers participating in the evaluation of new grasses varieties.

Continuation of the Southeast Asia Feed Resources Research and Development (SEAFRAD) network for sharing information among NARSs and in the region.

SEAFRAD News, Issue 10, May 2000, edited by Dr. Le Viet Ly, was published and distributed to all FSP countries. Contributing articles came from Indonesia, Philippines and Vietnam. New email connections were established in Vietnam, Indonesia and Thailand. A computer was provided to the FSP Indonesia office.

Vietnam.

M'Drak. Several projects were interested in the FSP activities. EnDA, a NGO for environmental development in developing countries, brought 24 farmers from Phu Yen Province to M'Drak to interact with farmers. They took back planting material of forages. Another project of the Department of Agricultural and Rural Development brought 30 farmers to visit FSP farmers in Daklak. Some technicians of the Department also participated in the training course for technicians. Other visitors were: a forestry project of ADB-Vietnam, ACIAR cattle breeding project, a project from Kontum province, and a project on cattle development in Daklak province.

Philippines

Cagayan de Oro. The project participated in the National Dairy Congress, which was held in Cagayan de Oro from 22 to 27 May 2000. FSP materials and forages were exhibited and seeds were sold.

Publications

Horne, P.M. and Stür, W.W. 1999. Developing forage technologies with smallholder farmers – how to select the best varieties to offer farmers in Southeast Asia. ACIAR Monograph No. 62, Australia, 80 pp.

Chinese, Vietnamese and Indonesian translation of Developing forage technologies with smallholder farmers.

Roothaert, R.L. 2000. Proceedings of the Inception Meeting of CIAT/ADB Project “Development of Sustainable Technologies for Resource-Poor Upland Farmers in Asia”, 17-18 February 2000, Los Baños, Philippines. CIAT, Los Baños, Philippines.

SEAFRAD News, Issue 10, May 2000.

Management activities

Letters of Understanding have been signed between CIAT and the implementing agencies in China, Lao PDR, Philippines, Thailand and Vietnam. The Letter of Understanding with Indonesia has been delayed due to administrative changes in DGLS in Jakarta.

Contractual agreements for disbursement of funds against outputs have been signed with managers implementing the research and development activities at each field site in all countries.

Visits have been made by CIAT Coordinators to all countries. Visits were made to:

China by Peter Kerridge in June.

Indonesia by Ralph Roothaert in February and June.

Lao PDR by Peter Kerridge in February and April.

Philippines (Mindanao) by Ralph Roothaert in May and July.

Thailand by Ralph Roothaert and Peter Kerridge in April.

Vietnam by Ralph Roothaert and Peter Kerridge in March and Peter Kerridge in June.

FSP co-ordinators and main implementers

Dr. Peter Kerridge, Coordinator CIAT – Asia, Los Baños, Philippines.

Dr. Ralph Roothaert, Regional Coordinator FSP, Los Baños, Philippines.

Mr. Eduedo Magboo, FSP Coordinator Philippines, Los Baños.

Mr. Phonpaseuth Phengsavanh, FSP Coordinator Laos PDR, Vientiane.

Mrs. Chaisang Phaikaew, FSP Coordinator Thailand, Bangkok.

Mr. Le Hoa Binh, FSP Coordinator Vietnam, Hanoi.

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Mr. Francisco Gabunada, Los Baños, Philippines.

References

Asian Development Bank 1999. Proposed Technical Assistance for the Fourth Agriculture and Natural Resources Research at CGIAR Centres. Manila, Philippines.

Appendix 1. Common and botanical names of forages mentioned in text

| Common name | Botanical name |
|--------------------|---|
| Arachis | <i>Arachis pintoi</i> |
| Brizantha | <i>Brachiaria brizantha</i> |
| Calliandra | <i>Calliandra calothyrsus</i> |
| Centrosema | <i>Centrosema macrocarpum</i> |
| Desmanthus | <i>Desmanthus virgatus</i> |
| Flemingia | <i>Flemingia macrophylla</i> |
| Gliricidia | <i>Gliricidia sepium</i> |
| Guinea | <i>Panicum maximum</i> |
| Leucaena K636 | <i>Leucaena leucocephala</i> variety K 636 |
| Retalhuleu | <i>Gliricidia sepium</i> accession Retalhuleu |
| Stylo 184 | <i>Stylosanthes guianensis</i> variety CIAT 184 |
| Vigna | <i>Vigna sp.</i> |

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