What Can We...

(Continued from page 1)

How do we help our farmer decision makers address soil fertility management issues in the uplands? How can we expand his (and her) menu of options? Who can serve as channels of information support assistance?

We can start with those who are already trying to do something about the concern — the service providers. The immediate circle would include individuals and organizations already involved in studying and promoting sustainable agriculture and community forestry and those concerned with preserving indigenous knowledge or IK. We must also work with the wider circle comprising of government extension officers involved in promoting soil fertility management and even local government officials concerned with helping their own farmers improve their living conditions.

What are the agenda? First, there is a need to help build among service providers awareness of and interest on the dynamic nature of fallow management in upland farming systems. Second, almost concurrently, there is a need to develop and disseminate tools that enable service providers help farmers to have wider choices. These choices would revolve around enhancing good soil fertility management (including fallows management) practices. It would also deal with challenges faced by settled upland farmers who are already dependent on external fertilizer inputs.

At present, two major avenues for awareness building and enabling of tasks must be undertaken: through networking initiatives and through field projects.

Networks

Networks refer to largely informal and voluntary initiatives to share information resources among one another. This is critical, considering that limited investment resources for studying and promoting the subject matter must be optimized. A key challenge among networkers is the ability to sustain the enthusiasm and energy of its contributors in the long run. This is true especially of networks that do not receive any external funding for their activities.

National or subnational networks seem to have a better chance to achieve sustainability because the proximity between network members allows the exchange of services and benefits beyond that of information sharing.

Field Projects

Field projects, on the other hand, refer to predominantly public sector projects that aim to address poverty and natural resources problems in the uplands. They are usually the one of the very few sources of public investment in the uplands. They are usually run by national government agencies, providing a range of benefits — roads, extension work, water supply, etc.

Sometimes, the challenge usually encountered in projects is how to utilize too much resources over very short project periods. In the rush to complete project targets, there is a tendency to overlook the significance of indigenous local knowledge in the design and implementation of research and extension programs. This is also partly explained by the lack of exposure and appreciation of the value of fallow management by project staff whose background is mainly on lowland agriculture or forest protection.

Joint work

The International Centre for Research in Agroforestry (ICRAF) and the International Fund for Agricultural Development (IFAD) are joining hands to help existing networks do a better job at promoting awareness and resource sharing to push soil fertility and fallow management practices. The joint work also aims to help selected upland projects acquire practical tools to better understand and take advantage of local knowledge resources in the design of their farm assistance programs. This ICRAF-IFAD initiative is part of a project entitled Technical and Institutional Innovations to Improve Participatory Development of the Upland Poor in Asia.

In the rush to complete project targets, there is a tendency to overlook the significance of indigenous local knowledge.

In 1997, more than 300 practitioners from the around the world convened in Bogor to review these ongoing efforts in the tropics of Asia. Subsequently, practitioners and researchers in the Philippines and Vietnam convened their own national level sessions and agreed to promote networking among others.

The joint ICRAF-IFAD project plans to help these and other networks in a small way by providing information support services to help reinvigorate and sustain active networking among practitioners. Part of this information support will be initially provided through a joint agreement between ICRAF and the University of the Philippines Los Baños (UPLB).

This newsletter would be one form of information support. Other information services would include an electronic database of fallow systems and practitioners and prototype information, education and communication campaign materials.

The joint program also aims to provide technical services to 11 IFAD- and ICRAF-assisted upland programs in Asia. Examples of upland programs would include the Ha Giang Development Program in Vietnam, the Participatory Integrated Development for Rainfed Areas Project in East Java, and the Western Mindanao Commodity Initiatives Project in the Philippines. These services will

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An Invitation to Join Documentation of Smallholder GMCC Systems in the Tropics

Milton Flores Barahona, Marcel Janssen and Ruud Kortekaas

The International Cover Crops Clearinghouse (CIDICCO), an NGO based in Tegucigalpa, Honduras, conducts an inventory of agricultural systems in the tropics including the use of leguminous (and nonleguminous) species as cover crops, green manures, or improved fallows, collectively called GMCCs. This is undertaken through a project entitled *A Catalog of GMCC Systems Used by Smallholders of the Tropics*, which is financially supported by the Rockefeller Foundation. The Project aims to explore potential cropping systems to improve productivity and sustainability of small-scale agriculture on marginal lands in the tropics.

To gain a better understanding of smallholder GMCC cases in the tropics, proper documentation and description of various GMCC systems including both successful and unsuccessful cases are being initiated by the project. The prospective GMCC systems for documentation could be with or without formal support of extension or research agencies, as well as systems that are still under research but have been tested with farmers. The documentation of GMCC systems is facilitated though the use of a structured questionnaire designed by the Project team. This questionnaire comes in two forms (which could be downloaded from the internet):

1. MS Word format in electronic form – *<http://www.cidicco.hn/survey_form.zip >*
2. Adobe Acrobat format in printable form - *<http://www.cidicco.hn/survey_eng.pdf>*

Submission of Entries

The accomplished questionnaire could be submitted through the following channels:

1. Email to any of the following addresses: *<mjanssen@bigfoot.com>*, *<cidicco@sdnhon.org.hn>* or *<rkortekaas@mayanet.hn>*
2. Fax to 504-239-58593
3. Hard copy via airmail to CIDICCO, Aptdo. Postal 4443, Tegucigalpa. Honduras CA

Rewards for joining the Project

Individuals, groups, organizations or institutions who will join the documentation of GMCCs will receive from CIDICCO the following rewards:

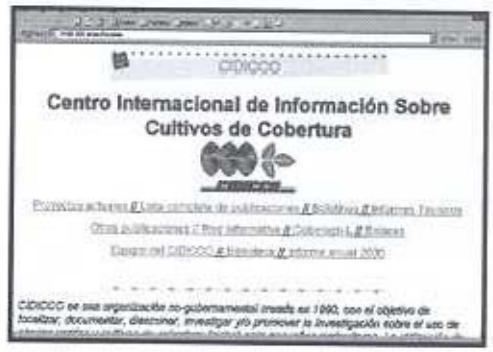
- CD-ROM, which contains the database;
- Inclusion in the directory of individuals, institutions, and organizations involved in smallholder GMCC research; and
- US$60.00 per GMCC case

CIDICCO looks forward to including you in our growing list of dynamic promoters of the use of GMCCs in the tropics. Your queries are welcome. You may send an e-mail to *<cidicco@sdnhon.org.hn>* for questions and clarifications. More power to you all!

About the authors:

Mr. Milton Flores Barahona is the Director of CIDICCO. Ms. Marcel Janssen and Ms. Ruud Kortekaas are consultants of CIDICCO.

CIDICCO has a web page in Spanish! Come and visit: <http://www.cidicco.hn>



What Can We...

(Continued from page 13)

include helping project staff to make better use of Participatory Rural Appraisal (PRA) approaches to diagnose farmer problems.

It is hoped that the diagnosis would then lead to the identification of beneficial local practices for fallow management and soil fertility improvement and include them in the design of on-site research for improved farming practices.

To further promote widespread interest and to encourage initiative, we would also like to help identify, recognize and share promising field practices & innovations made by extension staff and researchers in promoting fallows and soil fertility management in the uplands. Some of these can be incorporated into ongoing and new research and development undertakings and policy formulation. We invite our readers to share their own experiences on this subject through this newsletter or through the electronic discussion list that the UPLB Information Support Project is providing (please see article on Page 24).

About the Author

Mr. Ed Quebral is currently the Regional Natural Resource Management Specialist of the ICRAF Southeast Asia Regional Research Programme. For more information related to this article, please send e-mail to <ed_q@laguna.net> or <equeblatin@yahoo.com>.

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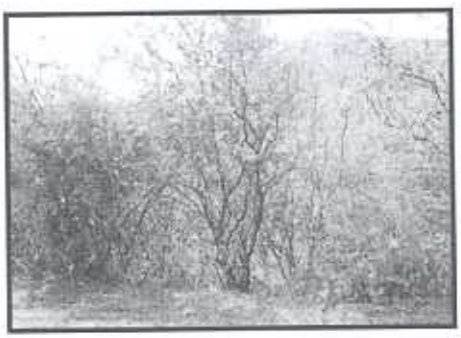
systems in the mid-1970s and early 1980s. Leguminous trees such as *L. leucocephala* and *G. sepium* are popular hedgerow species introduced in the sloping uplands at this time. Besides helping control erosion, they also serve as sources of organic material and nitrogen for the crops planted in the alleys between the hedgerows.

The Philippine fallow species can be classified into three categories: (1) tree-based; (2) shrub-based; and (3) grass/herb-based (Magcale-Macandog, Yao and Degal 1999). These documented fallow species were grouped into these categories (Tables 1, 2 and 3).



Top. Tree based fallow of *Acacia farnesia* in the sub-village of Halang in Jala-Jala, Rizal. *Middle*. Shrub-based fallow of *Tithonia diversifolia* in Ibaan, Batangas. *Bottom*. Grass-based fallow of *Imperata cylindrica* in Silang, Cavite.

Table 1. Components of the tree-based fallow system.

System	Species	Fallow Period
Naalad (Balabag system)	*Leucaena leucocephala*	4-6 yr
Leucaena (Occidental Mindoro)	*L. leucocephala*	2-4 yr
Leguminous (Batangas)	*L. leucocephala, Gliricidia sepium*	10-15 yr
Hedgerow Fallow in Davao	*L. leucocephala*	2-3 yr
Hanunuo-Mangyan	*L. leucocephala*	1-3 yr
Halang fallow system	*Acacia farnesiana, L. leucocephala, G. sepium*	2-5 yr
Interstitial tree-based fallows in Claveria	*Cassia spectabilis, Chromolaena odorata*	6 mo to 10 yr
Fallow system in Albay	*G. sepium, G. arborea, Sweitenia macrophylla*	
Medium-term fallow in Guba, Cebu	hedgerows: *L. diversifolia, Desmanthus verigatus, G. sepium*, and *L. leucocephala*; alleys: *Arachis pintoi*	2-4 yr
Long-term fallow in Guba	*L. leucocephala, G. sepium*	5 + yrs
Tiruray fallow system	Woody lianas of various species and large-leaved trees	2-5 yr
Basey fallow system	Anagassi tree, *Tmesipteris tannensis*, Yautia	10-15 yrs
Tagbanwa swidden system	*C. odorata, Barringtonia curranii*	—

Table 2. Components of the shrub-based fallow system.

System	Species	Fallow Period
Baybay, Leyte crop-fallow system	*Calopogonium mucunoides, Mimosa invisa, Pueraria phaseoloides, Synedrella nodiflora, Vernonia cinerea*	2-5 yr
Crop-fallow rotation system (Libon, Albay)	*Vigna radiata, Vigna unguiculata, Glycine max, Arachis hypogaea, Vigna sinensis*	3-4 mo
Crop fallow rotation system (Albay)	*Pueraria phaseoloides*	4-6 mo
Guba short-term fallow system	*Arachis pintoi, C. odorata*	1 yr
Calminoe fallow system	*Mikania cordata, Paspalum conjugatum, Melastoma* sp., *Histiopteris incisa*	1-10 yr
Heliotropium fallow system	*Heliotropium indicum, Bidens pilosa*	—

Table 3. Components of the grass/herb-based fallow system.

System	Species	Fallow Period
Shrub-based accelerated fallows	*Mimosa invisa, Calopogonium mucunoides*	2-4 yr
Inum-an fallow cycle	Herbaceous shrub, vine and low tree growth	3-15 yr
Ikalahan fallow system	Shrubs, grasses, and few trees (*Alnus japonica*)	10-15 yr

References:

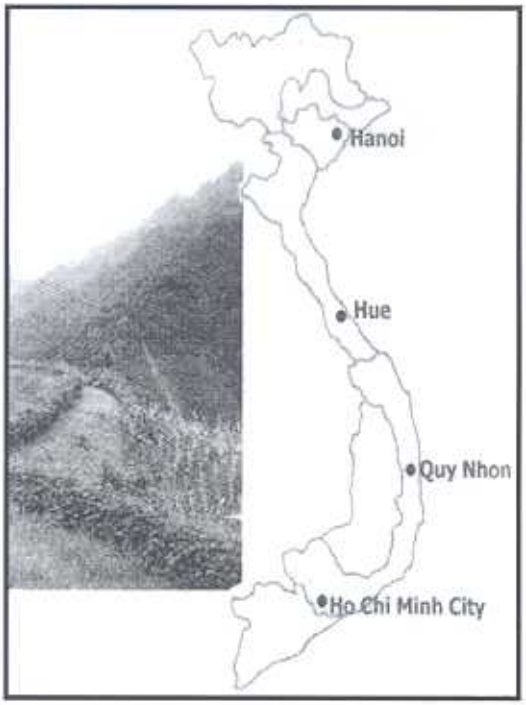
Magcale-Macandog, D.B., Yao R.T. and Degal, E.S. 1999. *Fallow systems in the Philippines: A review of literature*. In: Workshop Proceedings of Fallow Management Systems Documentation and Participatory Rapid Appraisal Methodology, 16 to 19 May 1999, Baguio City, Philippines. SEAMEO SEARCA, Laguna, Philippines.

Magcale-Macandog, D.B. 2000. *Improving estimates of C stocks of different fallow systems in the Philippines*. Paper presented to the 2000 Annual Meetings of the American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America, USA.

Fallow Management Initiatives in Vietnam

Chun K. Lai

Photograph courtesy of C.K. Lai



Top: A soil conservation structure in an upland community in Vietnam. *Bottom:* Vietnam and the sites of capacity building of the VACB Project.

Over the past 5 years, Southeast Asian countries have undertaken steps to study and/or document indigenous fallow management. In the Philippines, for instance, a 3-day national workshop on fallow documentation methodology was conducted on 17-19 May 1999. Details of this workshop are on pages 7, 8 and 9.

During the past few years in Vietnam, various fallow management initiatives have been spearheaded under the coordination of the Hanoi Agricultural University (HAU). These initiatives were developed as a follow-up to the international IFM workshop held in Bogor in 1997, as well as a response to the fact that very little attention had been given to the study of fallow management in Vietnam.

As an initial step, eight institutions collaborated during 1999-2000 to conduct an extensive literature review of fallow management-related research work in Vietnam.

These partners were:

1. Hanoi Agricultural University
2. Forest Science Institute of Vietnam
3. Xuan Mai National Forestry University
4. Tay Nguyen Central Highlands University
5. Institute of Ethnology
6. Thai Nguyen University of Agriculture and Forestry
7. Hue University of Agriculture and Forestry
8. Department of Sedentarized Cultivation and New Economic Zones, under the Ministry of Agriculture and Rural Development

This collaborative effort culminated in a draft synthesis report in Vietnamese, describing the country's experiences on improved fallow management practices used by upland farming communities. The 100-page draft report highlighted swidden cultivation and fallow management in Vietnam. It also listed and described major government policies related to indigenous fallow management. In addition, the report also provided some recommendations for the improvement of the conduct of research, development, and extension of fallow management in Vietnam.

During 14-16 November 2000, a national workshop on Indigenous Fallow Management in Vietnam was held in Bac Kan Province, northern Vietnam. With support from the Swedish International Development Agency (SIDA)-funded Vietnam Agroforestry Capacity-Building (VACB) Project, the Hanoi Agricultural University, the Vietnam Agricultural Science Institute and ICRAF jointly organized and facilitated this event.

The workshop aimed to evaluate the present status of swidden farming and fallow management in Vietnam, identify superior fallow management practices, increase the awareness of policymakers on the importance of fallow management, formulate possible future activities in IFM research and development; and publish an IFM synthesis report and workshop proceedings.

Highlights of the workshop included an overview and case study presentations on IFM policies, research activities, and promising practices in Vietnam – including perspectives from swidden farmers, field visits to see IFM activities in Cho Don District, and working group deliberations on future IFM directions and activities.

Participants came from different parts of Vietnam, representing swidden farming communities, research institutions, academe, policymakers, provincial departments of agriculture and rural development, NGOs, and international organizations and projects. The workshop proceedings have been published by HAU in Vietnamese.

These initiatives have been supported by small grants from the VACB Project. The initial phase of VACB was funded by the SIDA from May 1998 to June 2001 and implemented by Vietnamese partners and ICRAF. Through the VACB Project, ICRAF collaborates with an informal network of Vietnamese institutions and international organizations active in agroforestry. Within this network, collaborating scientists, researchers, trainers, and

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extension staff were given the opportunity to enhance their capacity to conduct research, development, and training on upland agroforestry and alternatives to slash-and-burn agriculture.

An expanded 5-year follow-up phase — entitled the Agroforestry Support Project for Vietnam and Lao PDR (ASP-V&L) — was approved by SIDA and became operational in July 2001.

For more information on fallow management initiatives in Vietnam, please contact Dr. Tran Duc Vien, Director, Center for Agroecological and Environmental Studies, HAU. <*lenam@netnam.org.vn*>. For more information on VACB/ASP-V&L, please contact Mr. Chun K. Lai, Senior Capacity-Building Specialist (Consultant), ICRAF Southeast Asia Regional Research Programme <*ChunKLai@cs.com*>.

References

Hanoi Agricultural University. 2000. Synthesis report of IFM in Vietnam. A draft report compiled by Hanoi Agricultural University, Vietnam.

Hanoi Agricultural University. 2001. Proceedings of the National Workshop on Indigenous Fallow Management in Vietnam, 14-16 November 2000, Bac Kan, Vietnam. Hanoi Agricultural University, Vietnam (in Vietnamese).

Evolving Soil Fertility...

(*Continued from page 6*)

Back to traditional farming strategies

The drive toward modern, market-oriented farming is causing severe ecological degradation and economic marginalization. Market agriculture, migrant labor, and the desire to participate in the consumer culture are sapping the cultural and spiritual basis of traditional society and place a heavy burden on survival strategies. Reorientation toward traditional farming strategies or urbanization and the consequent weakening of indigenous culture seem to be the two development polarities available to indigenous communities and resource-poor farmers.

Evidences from case studies have shown that traditional farming strategies can still provide a sustainable basis for livelihood. Farmers can make their way between subsistence farming, market farming, and urban employment and succeed in intensifying land use while controlling ecological degradation. These farmers often complement natural methods of SFM with the judicious use of small amounts of synthetic fertilizers. There are, however, many cases where farmers have been less successful. They find themselves trapped in such poverty and ecological degradation that they are forced to migrate to the cities.

Ecologically sound market agriculture

Integrated nutrient management (INM) or integrated plant nutrient systems (IPNS) refers to strategies that combine the use of internal and external sources of nutrients in a local situation. These strategies allow a more efficient, profitable and ecologically sustainable use of synthetic fertilizers and other external inputs in market agriculture, which, in turn, lowers the threshold for farmers working in less favorable conditions to become part of or remain within the market economy without degrading their system. Decreasing the cost of transport, marketing, inputs, and facilitating credit can help farmers become more competitive in the market.

Learning to adapt SFM

Given the changing conditions, needs and insights, farmers have to constantly adapt their SFM practices. However, new practices have to accommodate not only the prevailing natural, economic and cultural conditions but also the way agriculture and society have evolved over time. Evaluation of learning processes can be enhanced by learning tools and dialogues that build on traditional practices and insights.

Article extracted from "*Soil Fertility Under Pressure*" by Mr. Coen Reijntjes, ILEIA Newsl. 13(3) 4. This article is also available online at: <*http://www.oneworld.org/ileia/ newsletters/13-3/13-3-4.htm*>

The Alternatives to Slash and Burn (ASB) Programme: An Overview

The Alternatives to Slash and Burn (ASB) Programme works on the assumption that the development of agroforestry-based forms of intensified land use as an alternative to slash-and-burn can help alleviate poverty and improve human welfare. By identifying alternatives to slash-and-burn and providing options from which farmers can choose, the ASB Programme aims to provide benefits from household to global scales.

ASB is a system-wide initiative of the Consultative Group on International Agricultural Research. Since it began in 1992, the Programme has developed into a consortium of nine international research centers and 62 national research institutes, universities and other government and nongovernment organizations. The International Centre for Research in Agroforestry (ICRAF) is the convening centre for ASB because there is a close link between agroforestry options and alternatives to unsustainable slash-and-burn practices.

ICRAF contributes to the ASB Programme through its researches in the humid ecoregions of Latin America, and Southeast Asia and the humid lowlands of West Africa. In Indonesia, the peneplain zone of Sumatra is ASB's focus of interest, with research sites in Jambi and North Lampung. Associated research is carried out in West Lampung (Krui) and West Kalimantan. The Mae Chaem watershed in Thailand and Claveria and Lantapan in the Philippines were also chosen as ASB benchmark sites.

This information was accessed at <*http://www.icraf.cgiar.org/sea/Seaasb/ASBSEA*>.

Fallow Management Strategies in Southeast Asia: Some Benefits and Constraints

Paul Burgers

Rotation of cropping and fallow periods is commonly practiced in many upland farming systems in Southeast Asia. Fallow periods have a number of benefits. The most important ones include soil fertility restoration, suppression of weeds, and protection of the soil against erosion. Fallows may also supply a source of cash income for the farmers through the existence or planting of specific economic valuable species. In addition, fallows may provide products that serve as agricultural inputs such as fodder and fencing materials for farms with a livestock component.

Historically, in most traditional shifting cultivation systems, fallow vegetation was simply left to establish naturally after abandonment of a cropped field. In the recent decades, many households have shifted toward more active management of fallows to better serve the changing needs and priorities of the farming households.

Some of these managed fallow strategies still mimic natural vegetation succession. Usually, these strategies are based on species enrichment to increase the economic value of the fallow vegetation and have sometimes led to the development of semi-permanent tree-crop based systems (Raintree and Warner, 1987; Cairns and Garrity, 1999; Sanchez, 1999). Other management strategies focus on the intensification of the cropping period through the incorporation of species that enhance soil fertility restoration as the traditional fallow period is shortened. The different strategies are largely a result of the dynamic context in which people live. This context consists of changes in the biophysical, social, economic, and political environment.

People in the forest margins: pioneers and indigenous forest farmers

Forest farming communities in Southeast Asia can be broadly defined as consisting of two groups: "pioneers or colonists" and "indigenous forest farmers".

The pioneer or colonist group includes households that have migrated to the upland areas for safety reasons due to political instability or wars. It also includes households that have migrated due to the deterioration of their livelihood to the point where upland migration is the only option. A third subset of this group consists of more voluntary "pioneers", who see greater prospects for wealth accumulation in the uplands (White, 1991; Dietz et al., 1992). These more voluntary pioneers are, on the whole, relatively resource-rich migrants (usually through off-farm employment) who invest in forest conversion to establish perennial and annual cash crop gardens. These various pioneer households are generally unfamiliar with the natural environment in which they operate and do not rotate crops. They are more likely to abandon cropped fields once the soils have become badly and frequently irreversibly degraded (Fujisaka and Wollenberg, 1991; Sunderlin, 1997).

The second group, indigenous forest farmers, consists of communities that have practiced forest farming and lived in the forest margins for generations. They have gradually accumulated local ecological knowledge and experiences through decades of trial-and-error experimentation in and with the natural environment. They have learned to practice agriculture sustainably, enabling them to satisfy their livelihoods at the forest margins without causing large-scale deforestation. Slash-and-burn techniques are an integral part of this group's rotational farming systems, which have featured short cropping periods followed by long forest fallows to restore soil fertility.

Fallow management strategies

Indigenous forest farming communities have developed fallow management strategies over time to adapt to changing environmental, economic, social, and political conditions. Three types of adaptive strategies have been distinguished: (1) improved fallows focusing on increasing the rate of restoration of soil fertility and other ecosystem properties following cropping such as reduction in pernicious weed populations; (2) enriched fallows focusing on increasing the direct economic benefits of the

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Fallow Management Strategies...

(Continued from page 18)

natural fallow vegetation; and (3) a focus on integrating soil fertility and economic benefits through integration of livestock (Raintree and Warner, 1987; Cairns and Garrity, 1999; Sanchez, 1999).

Benefits and constraints of improved fallows

For households that rely solely on upland farming and live too far away from markets where they can easily sell their products or buy food and inputs for their agricultural system, soil fertility restoration for food cropping usually remains the dominant purpose of the fallow. The approaches that have been developed by the farming households to manage the fallow and its component species to enhance production of the cropping system can be summarized as follows: (1) restore soil fertility more completely during a fallow period of the same length, (2) shorten the fallow period and increase the cropping intensity while maintaining the same level of soil fertility at the start of each cropping cycle, or (3) a combination of (1) and (2). For example, in Nagaland, northeast India, the stumps of the alder trees in the *Alnus nepalensis*-based fallow system are kept in the field during the cropping season so that during the fallow period, they will coppice rapidly, forming a closed canopy of nutrient-rich biomass that can be cut to enrich the soil before the next cropping phase. In northern Vietnam, the introduction of leguminous trees such as *Tephrosia candida* has enabled a decrease in fallow length from 10-15 to 4-6 years (Siem and Phien, 1993; Fagerstrom, 1999).

In systems where the fallow period becomes too short for trees to grow, shrubs become the dominant fallow species. An example of a shrub that enhances soil fertility is *Tithonia diversifolia* of the Asteraceae family (daisy fallow species). It is commonly found in shrub-based fallow systems in the Philippines, Vietnam, and Indonesia where it is used to enhance soil fertility.

Finally, the establishment of seasonal fallows between harvesting and planting seasons may be the final option for restoring soil

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Suggested Readings on Fallow Management

1. Burgers, P., Ketterings, Q. M. and Garrity, D.P. 2000. Fallow management initiatives and issues in Southeast Asia. Paper presented at the Fallow Management Symposium during the Annual Meeting of the American Society of Agronomy, 08 November 2000, Minneapolis, Minnesota, USA.
2. Cairns, M. (ed). forthcoming. Voices from the Forests: Farmer Solutions Towards Improved Fallow Husbandry in Southeast Asia. Jakarta, Indonesia: International Centre for Research in Agroforestry (ICRAF).
3. Cairns, M., Garrity, D.P. 1999. Improving shifting cultivation in Southeast Asia by building on indigenous fallow management strategies. Agrofor. Syst. 47:37-48.
4. International Centre for Research in Agroforestry (ICRAF), International Development Research Centre (IDRC) and Cornell International Institute for Food, Agriculture and Development (CIIFAD). 1998. Programme and compilation of abstracts from the Workshop on Strategies for Intensification of Shifting Cultivation in Southeast Asia, 23-27 June 1997, Bogor, Indonesia.
5. Fagerstrom, M. 2000. Agroforestry systems in northern Vietnam with *Tephrosia candida* as an alternative to short-fallow crop rotations. Doctoral thesis, Sveriges Lantbruks Universitet (SLU), Department of Soil Sciences, Uppsala, Sweden.
6. Magcale-Macandog, D.B. 2000. Improving estimates of C stocks of different fallow systems in the Philippines. Paper presented at the Fallow Management Symposium during the Annual Meeting of the American Society of Agronomy, 08 November 2000, Minneapolis, Minnesota, USA.
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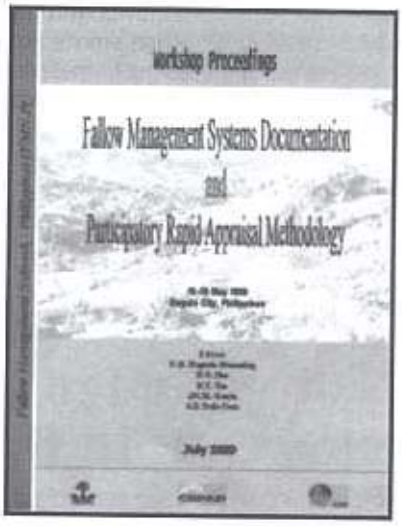
8. Sanchez, P.A. 1999. Improved fallows come of age in the tropics. Agrofor. Syst. 47:1-3
9. Van Noordwijk, M. 1999. Productivity of intensified crop fallow rotations in the Trenbath model. Agrofor. Syst. 47:223-237.



The Workshop Proceedings on Fallow Management Systems Documentation and Participatory Rapid Appraisal Methodology includes a compilation of papers documenting various fallow systems in the Philippines and outputs from the PRA methodology workshop on fallow system documentation.

For those interested in fallow management in the uplands of Asia, the above mentioned publications are recommended for reading. For readers who are aware of related reading materials not listed, you are welcome to send bibliographies and description of the reading materials. Those received items will be included in the next issue of the newsletter, with proper recognition of the sender. Please refer to the contact address of the editorial staff at the last page of this newsletter.

Discussion on Cover Crops and Managed Fallows on the Net

Cover crop is an important part of upland farming systems. Not only does it contribute to increasing soil fertility, it also reduces soil erosion on sloping farms. There have been advances in using and developing cover crops in the Latin American region. However, not much efforts have been done in Southeast Asia. In this regard, there are valuable lessons from Latin America which can be transferred to Southeast Asia. These learnings and clusters of ideas on cover crops could be explored by subscribing to electronic mailing lists.

One of the most established e-mailing lists for cover crops is the **MULCH-L**, hosted by the Management of Organic Inputs in Soils of the Tropics (MOIST) Group of Cornell University, USA. The MULCH-L is designed for interdisciplinary exchange of information on cover crops, managed fallows and other woody/non-woody mulch-based agricultural systems in tropical and subtropical areas. Members of this list group are encouraged to post questions or share information that may be useful for other members involved in research or extension of sustainable agricultural practices.

At present, MULCH-L has developed an "Archives by Topic" of recent discussions. This is currently available on the web at <http://ppathw3.cals.cornell.edu/mba_project/moist/mulchmail.html>

To subscribe to MULCH-L, send the following message to <listproc@cornell.edu>: SUBSCRIBE MULCH-L Firstname Lastname.

Ms. Lucy Fisher, *second from left*, is one of the list owners of the MULCH-L hosted by the MOIST Group at Cornell University, USA. Photo taken on 19 May 1999 during the third day of the PRA Methodology Workshop in Baguio City, Philippines.

There is also a similar discussion list in French known as ECVECS-L. This is maintained by the Cover Crops Information and Seed Exchange Center for Africa (CIEPCA) with assistance from MOIST Group. To subscribe, send the following message to <listproc@cornell.edu>: SUBSCRIBE ECVECS-L Firstname Lastname.

Those who prefer Spanish can join COBERAGRI-L. This list is maintained by the International Cover Crops Clearinghouse (CIDICCO) based in Honduras. This electronic discussion group was set by Mr. Milton Flores, who is the director of CIDICCO and MOIST Central America coordinator, with assistance from the MOIST outreach coordinator, Lucy Fisher. To subscribe, send the following message to <listproc@cornell.edu>: SUBSCRIBE COBERAGRI-L Firstname Lastname.

A New Publication on Shifting Cultivation in Asia: Now Out in the Market

The International Institute of Rural Reconstruction (IIRR) and ICRAF joined hands with the International Fund for Agricultural Development (IFAD), the International Development Research Centre (IDRC) and the Cornell International Institute for Food, Agriculture and Development (CIIFAD) to produce a compilation of exemplary practices on shifting cultivation and fallow management issues. This publication involves the use of a participatory writeshop process in which participants from across Asia participated. Two major sections are devoted to overview and descriptions of shifting cultivation practices. This 421-page volume is highly recommended to readers interested in an overview of the great diversity of shifting cultivation issues and practices in Asia.

The Book on Shifting Cultivation comes with a colorful cover and has a series of easy-to-read articles prepared by experts from around the world.

Correct citation:

IFAD, IDRC, CIIFAD, ICRAF, and IIRR. 2001. Shifting Cultivation: Towards Sustainability and Resource Conservation in Asia. International Fund for Agricultural Development, International Development Research Centre, Cornell International Institute for Food, Agriculture and Development, International Centre for Research in Agroforestry and the International Institute of Rural Reconstruction. 421 p.

For information on how to order, please write to IIRR Publications at <information@iirr.org> or <Lilibeth.Sulit@iirr.org>

Fallow Management Strategies...

(Continued from page 19)

A cluster of *Mimosa invisa* plants in a fallow plot in Batangas, Philippines.

fertility in systems where fallow periods are further reduced, as in the case of *Mimosa invisa* fallows in the Philippines. In these systems, fallow management is gradually replaced by semi-permanent cropping systems that may or may not be able to sustain production.

Shortening the fallow period carries the risk of 'over-intensification', degradation of the soil, and a decline in household food security. A simple model of crop fallow systems (Van Noordwijk, 1999) suggests that to obtain maximum crop yields per hectare in a sustainable way, soil fertility at the start of each new cropping cycle needs to be about 55% of the maximum value or higher. Effects on biodiversity are also a concern as fallows are "improved," as the introduction of a single or several species for specific fallow purposes tends to reduce plant diversity of the fallows.

Benefits from and constraints to enriched fallows

Enriched fallows are observed in areas where livelihood needs and aspirations of the households change and economic considerations grow in importance. These are areas where links with urban areas and the monetary economy intensify, where there are large enough markets to sell agricultural surpluses, and where there are significant alternatives on-farm or off-farm employment opportunities. The growing need and desire to obtain cash income often result in a partial shift from subsistence farming to production of economically valuable annual crops and perennials for the market. In particular, when farming households largely depend on their off-farm income for their livelihood, fallow lands may be planted with trees that have long maturity periods as an investment strategy.

One of the management strategies for enriching fallows is to plant and promote the growth of economically valuable species in the fallow vegetation, including fruit and other non-timber tree species to obtain cash income (Wiersum, 1997a; Van Noordwijk and Swift, 1999). In some highly degraded lands of Sumatra, Indonesia, households have converted traditional fallows to multi-story tree-crop plantations of rubber, fruit trees, and rattan (Gouyon et al, 1993; Angelsen, 1995; Dove, 1998). Other management strategies include the planting of rattan in natural fallows in the Philippines and Indonesia (Godoy, 1990; Siebert and Belsky, 1994) and the enrichment of fallow vegetation with paper mulberry in northern Laos.

A system of relay-planting vegetables, coffee, and cinnamon in sequence is practiced in Kerinci, West Sumatra, Indonesia, to provide short-, medium-, and long-term cash income (Burgers and William, 2000). By imitating the crop-succession phases of a natural fallow, vegetables are planted first to provide the short-term cash income during the initial 2 years of establishment of forest-like structure of coffee-based system. After 2 years of coffee growth, vegetable growing is not feasible anymore due to overshadowing the coffee trees. At this time, cinnamon seedlings are planted in the coffee stand. After 3-4 years of earnings from the coffee harvest, the canopies of the cinnamon trees close and coffee can no longer be harvested. From this time on, the branches of some cinnamon trees are harvested to satisfy daily and/or weekly cash needs. The bark of all the trees (the main product) may be sold at once when a large sum of cash is needed.

Similar strategies are applied to establish smallholder rubber gardens in Sumatra (De Jong, 2001) and rattan and rubber forest gardens intercropped with rice in East Kalimantan, Indonesia (Mussche, 2001). Such succession-based systems provide households with cash income, while the architectural structure of these tree-based systems provides a certain degree of biodiversity. The systems also minimize erosion and surface run-off of water, thus protecting both the uphill areas and rice fields in the valleys (De Foresta and Michon, 1990; Wickramasinghe, 1997; Wiersum, 1997a; Dove, 1998; Tomich et al., 1998b).

Despite the numerous benefits and the long-term steady cash flow provided by these systems, wider adoption of these strategies has been limited due to a number of factors. Foremost is the larger area of land required to satisfy cash income needs of the household, particularly during the establishment period of the trees, and the need to plant food crops. The area requirement can vary, depending on off-farm employment opportunities available to augment cash and food needs (Burgers and William, 2000; Sabirin and Hamdan, 2000). Another factor is the long waiting period before yields from the perennial crops can be harvested. During this waiting period, households would need other sources of income or food such as off-farm employment or planting of annual crops. A third factor is the increased dependence of households on market forces and increased exposure to risk due to price volatility of these cash crops when farmers plant food crops instead of non-food cash crops.

Benefits from and constraints to livestock integration

Livestock are an extremely important component of farming systems for a number of reasons. First, they are an important source of cash income through the sale of animal products such as meat, milk, and skin (Hansen, 1997). Animals such as cattle and buffalo provide draft power in land preparation (cultivation and harrowing) and in transporting farm products and household supplies. They also play an important role in nutrient cycling in mixed crop-livestock systems, depending on what they are fed and whether or not manure is brought back into the field (Huxley, 1999).

Fallow species such as *Leucaena leucocephala* can be used as fodder for livestock. In eastern Indonesia, households use *L. leucocephala* as a fallow species in a rotational system with maize (Metzner, 1983; Yuksel and Aoetpaj, 1999). In addition to being a source of fodder, these trees also serve the purpose of enhancing soil fertility as they are able to fix nitrogen in the soil.

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Fallow Management Strategies...

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A number of factors hinder the integration of livestock into cropping systems. A major constraint is the investment needed to acquire them and any necessary feed, fencing materials, or grazing areas. Additional labor may be needed for herding and tethering the animals. Allowing animals to roam and graze freely in the farm may lead to overgrazing of young fallow vegetation, thereby reducing the regenerative processes of a natural fallow. Also, trampling may lead to soil compaction.

The key to success in the introduction of livestock as a means of improving fallow-based farming systems depends on how well they can be integrated into the system or segregated from crops (Cairns and Garrity, 1999). Karen communities in northern Thailand have successfully integrated cattle into their farming system. They allow the cattle to graze freely in the young fallow vegetation during the fallow period and herd the animals during the cropping season of rice (Burgers and Trakamsuphakon, 2001).

In other cases, where the livestock component can be the major source of household cash income as in the remote villages of northern Laos, households may decide to invest more seriously in the integration and segregation of livestock into their farming system. In villages in Laos, households enrich fallow vegetation with forages to ensure availability of feed and they establish fences around temporary rice fields to reduce crop damage by grazing animals (IFAD et al, 2001).

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Information on Indigenous Fallow Management on the Web

On 23-27 June 1997, a workshop on Indigenous Strategies for Intensification of Shifting Cultivation in Southeast Asia was held in Bogor, Indonesia. International funding agencies composed of ICRAF, IDRC, CIIFAD, and others jointly supported the conduct of this workshop. To date, this is one of the biggest gathering of researchers, scientists, and other concerned individuals who focused on the study and documentation of fallow management systems in Southeast Asia. Part of the outputs of this workshop could now be accessed from the internet. (See numbers 1 and 2.)

On the other hand, numbers 3, 4, and 5 are related works on fallows, which include a database of abstracts and lecture notes. These are some of the websites where materials on soil fertility and fallow management in Southeast Asia can be downloaded.

1. **Indigenous Strategies for Intensification of Shifting Cultivation in Southeast Asia. Compilation of Workshop Abstracts. Bogor, Indonesia. 23-27 June 1997. Edited by M. Cairns**
<http://www.idrc.ca/cbnrm/documents/abstract_main.cfm>

2. **Indigenous Strategies for Intensification of Shifting Cultivation in Southeast Asia — Opening Programme**
<http://www.idrc.ca/cbnrm/documents/abstract_opening.cfm>

3. **ASA 2000 Fallow Management in the Tropics Symposium.** November 8, 2000, Minneapolis, Minnesota. Sponsored by the Management of Organic Inputs in Soils of the Tropics (MOIST) and the Cornell International Institute for Food, Agriculture and Development (CIIFAD), both based in Cornell University, USA.
<http://ppathw3.cals.cornell.edu/mba_project/moist/ASAprogr.html>

4. **Indigenous Fallow Management Lecture Notes in PDF format**
<http://www.icraf.cgiar.org/sea/Training/Materials/lecture%20notes/LecNotes-New/4%20IFM-LN.pdf>

5. **Intensification of shifting cultivation — Editorial**
<http://www.oneworld.org/ileia/newsletters/16-3/04.PDF>

This newsletter will also be accessible through the Internet. The tentative web site can be accessed at: <http://www.geocities.com/fallownet >

A Soil Fertility Kit for the Southeast Asian Uplands

In Southeast Asia, the greatest potential for future increases in agricultural production and productivity lies in the 295 million ha of 'upland' or rainfed land. Most tropical upland soils have low fertility status and are particularly vulnerable to degradation when cleared of the protective forest cover.

Rapid deforestation and poor crop management (e.g., slash-and-burn methods) are the major causes of soil erosion and upland degradation in Southeast Asia. Biological, physical, and chemical deterioration of upland soils marks the onset of a vicious cycle of decreasing yields, income reduction, and environmental destruction. As a result, most small-scale upland farmers are unable to participate fully in the developing regional market economy.

Participatory methods are more suitable than prescriptive packages in upland farming systems development, and technology needs to be developed and tested with the full involvement of local farmers. There is an urgent need for soil fertility recapitalization in the uplands, where years of neglect have led to deterioration in soil fertility. But at present, extension services in the uplands are neither prepared nor equipped for such a role.

A new handbook is now available: 'Soil Fertility Kit' by T.S. Dierolf, T. Fairhurst, and E. Mutert is a compendium of information and methods for managing upland soil fertility in Southeast Asia. The handbook, written in an easy-to-use format, is a useful toolkit for extension workers, farmers and researchers.

This handbook, whose cover appears on the top, right hand side, basically deals with these topics:

- Identifying soil fertility problems in upland soils
- Involving farmers in soil fertility management
- Calculating a nutrient budget
- Identifying nutrient deficiency symptoms

This book announcement could also be accessed at <http://www.ppi-far.org/ppiweb/seasia.nsf/$webindex/E0292B393405F44148256ADC0015F19C>

Some Organizations Concerned with Soil Fertility and Fallow Management in the Uplands

- Alternatives to Slash and Burn (ASB) Consortium
- ASEAN-Canada Fund
- Australian Centre for International Agricultural Research (ACIAR)
- Cornell International Institute for Food, Agriculture, and Development (CIIFAD)
- International Centre for Research in Agroforestry (ICRAF)
- International Development Research Centre (IDRC) of Canada
- International Fund for Agricultural Development (IFAD)
- International Institute of Rural Reconstruction (IIRR)
- The Rockefeller Foundation (RF)
- The Ford Foundation (FF)
- University of the Philippines Los Baños (UPLB)
- United States Agency for International Development (USAID)

Create the *SFM* Logo and Win!

The editorial team is happy to announce a ***logo-making contest*** for this newsletter. The winner will receive a complete set of the project's information products, including all issues of the newsletter, poster series, and a special publication on Soil Fertility and Fallow Management. The winner will also receive a copy of ***Shifting Cultivation in Asia***, the book featured on page 20. A surprise giveaway also awaits the winner. Non-winners will also receive a special gift.

Logo entries should symbolize the importance of soil fertility and fallow management in the uplands of Southeast Asia, and should be accompanied by a brief description. The winning logo will be printed on all succeeding issues of the newsletter.

Entries should be submitted by email or postal mail to the editorial team not later than 31 March 2002.

The *Soil Fertility Matters* is a semi-annual publication of the Information Support Project based at UP Los Baños Foundation, Inc., College, Laguna, Philippines.
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Announcements

1. ***Fallow Discussions on the Net***
   To facilitate a dynamic discussion on soil fertility and fallow management, the Information Support Project is developing a discussion group based at *Yahoo! Groups* To join, send an e-mail to <*fallownet@yahoo.com*> with "JOIN FALLOWNET" in the subject heading.

2. ***The Conservation Farming Movement (CFM)***, based at the University of the Philippines Los Baños, will have its next annual conference in Cagayan de Oro City, Philippines, on 16-18 July 2002. This upcoming conference will have paper presentations grouped along four major themes. One of the themes will focus on the Philippine fallow systems. For more information, please contact the CFM president, Dr. Virgilio T. Villancio, at <*villancio@yahoo.com*> or the CFM secretary, Mr. Jose Nestor M. Garcia at <*jnmg@mudspring.uplb.edu.ph*>.

3. ***Related Conferences***
   A. International Soil Conservation Organization (ISCO) 12th Conference, 26-31 May 2002, Beijing, China.
   B. International Symposium on Sustainable Soil and Water Resources Management, 30-31 May 2002, Manila, Philippines.

4. ***Response to Land Degradation***
   A new book from the World Association of Soil and Water Conservation. Designed for advanced readers interested in methods of sustainable land management and prevention and control of land degradation. Provides a coherent view of the current situation about land degradation and the human response to the problem. Published by Science Publishers, Inc., Enfield, New Hampshire, USA.

5. ***For Agroforestry Modelers...***
   WaNuLCAS Model Release 2.1 now available on the web at:
   <*http://www.icraf.cgiar.org/sea/AgroModels/Wanulcas/index.htm*>
   This new version features (1) a module to grow palm tree; (2) an ACCESS database listing all WaNuLCAS input and output parameters; and (3) database sets available in English, Bahasa Indonesia, and Portuguese. For more information, please contact Dr. Meine van Noordwick at <*m.van-noordwijk@cgiar.org*>

6. ***Readers of this newsletter*** are welcome to send related announcements, updates, and upcoming conferences. The items received by the editorial staff will be included in the next issue of the newsletter in the middle of year 2002.