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Soil Fertility Matters

A Newsletter on Soil Fertility and Fallow Management for the Southeast Asian Uplands

This first issue of Soil Fertility Matters is produced under the project titled *Interim Information Support for the Southeast Asia Regional Network on Soil Fertility and Improved Fallow Management*, based at the University of the Philippines Los Baños-Foundation, Inc. (UPLB-FI) and funded by the International Fund for Agricultural Development (IFAD) through the International Centre for Research in Agroforestry (ICRAF).

Inside this issue...

Fallow is allowing the soil to rest from cultivation for six months or more. In the tropics, fallow areas include secondary forest, abandoned cropland, pasture or degraded wasteland, and the intervening time between cropping periods (Barker, 1984).

Information on Soil Fertility: Does It Really Matter?

The past decade has witnessed an upsurge in interest in the poor living in the sloping hillylands and on forest margins of Southeast Asia. Considerable attention is being given to the issues of climate change, watershed management, governance and biodiversity conservation: all major factors influencing livelihoods and resource use in the uplands.

However, one component that still does not receive the level and quality of attention it deserves is *soil fertility in the uplands*. Some view this as a narrow, technical dimension. This neglect is seen at many levels: policy makers, donors, academics and practitioners in civil society and governments. One relatively recent, but rare, milestone was the conference on fallow management in Bogor and the subsequent work in the Philippines and Vietnam (see other articles in this issue). The conference held in Bogor focused on indigenous strategies for shifting cultivation in Southeast Asia.

This newsletter is a similar effort to achieve the same goal aimed at drawing attention to soil fertility and fallow management. By rebuilding soil fertility using indigenous and/or improved systems, dependence on external inputs can be reduced and the problem of marginal, usually unpredictable, returns from farming in the uplands can be partially addressed.

This first issue of the newsletter and the subsequent issues will present a diversity of perspectives on soil fertility and fallow management. Other information-related products are envisaged to complement efforts to improve informal networking and knowledge management among key players to bring more attention, discussion and action on soil fertility and fallow management issues.

JG

Indigenous Pathways to Fallow Management

Dennis P. Garrity and Chun K. Lai

Inspite of the rapid industrialization of some tropical countries in the Asian continent, a significant chunk of its poorest people remain dependent on shifting cultivation for livelihood. In many uplands in Asia, shifting cultivation, also known as "slash-and-burn or swidden agriculture", is the main farming system used to produce food staples such as rice, maize, cassava, and taro. Characterized by the sequential rotation of forest vegetation and cultivated food crops, it is closely linked with sociocultural values that are central to the lives and livelihood of shifting cultivators and their communities.

Shifting cultivators usually slash and burn secondary forests or fallows and prepare the land for food crops. Fallows, which restore soil fertility and suppress weeds, occur between periods of food crop cultivation. Fallow periods vary from a short of six months to a long of 20 years, depending on the practice of the cultivator.

page 3

A young secondary forest being cleared through slash-and-burn cultivation by indigenous people in Palawan, Philippines

What Can We Do Now?

Eduardo E. Queblatin

Improving soil fertility and fallows in the uplands is not as glamorous as working in, say, *biodiversity* and *climate change*. Yet, the topic is very close to the hearts of those whose day-to-day decisions matter most in the uplands where government presence is hardly felt. These decision makers would be the upland farmers and swidden agriculturists.

page 13

Information Support for Soil Fertility and Fallow Management Launched in Los Baños, Philippines

Damasa B. Magcale-Macandog and Richard T. Yao

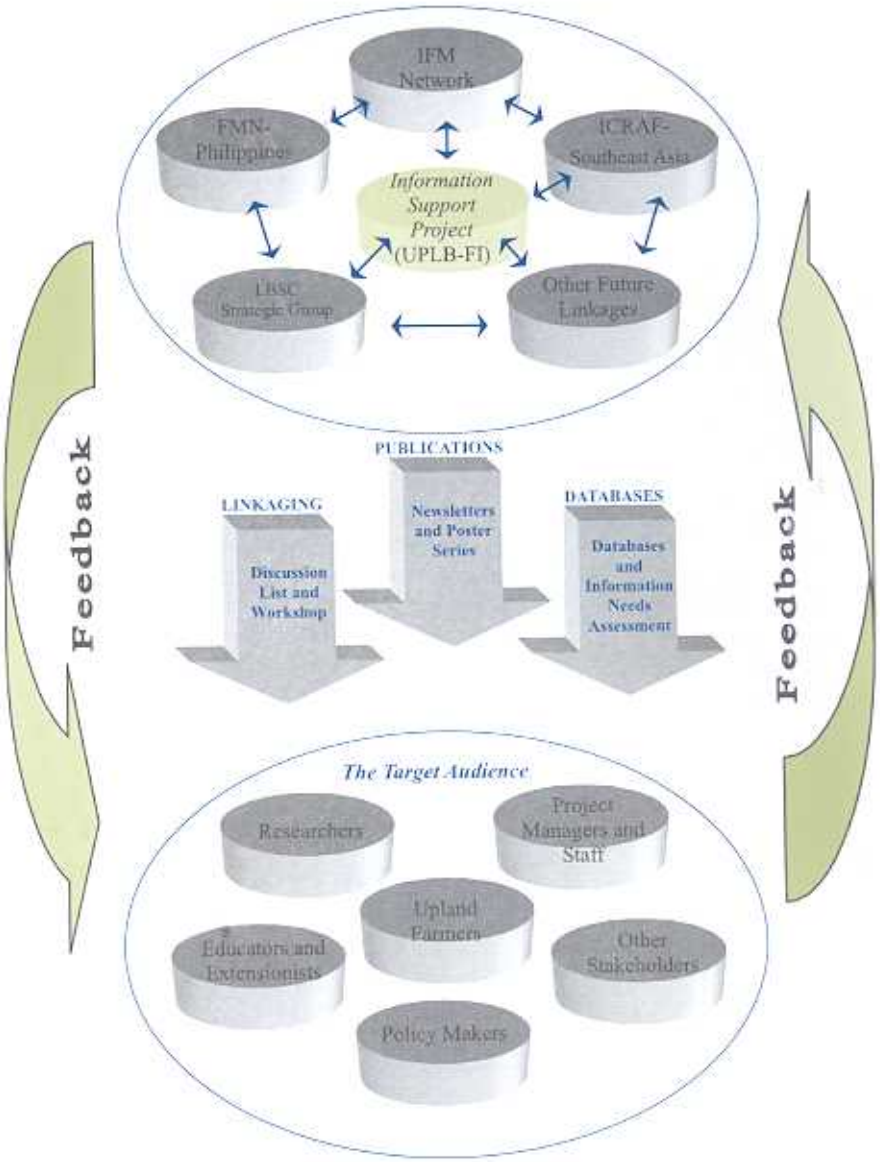
The University of the Philippines Los Baños Foundation, Inc. (UPLB-FI), in collaboration with the International Centre for Research in Agroforestry (ICRAF), launched the *Interim Information Support for the Southeast Asia Regional Network on Soil Fertility and Improved Fallow Management* last 16 September 2001. This information support project provides an avenue for information exchange on soil fertility and improved fallow management for Southeast Asian tropical upland areas. Jointly funded by the International Fund for Agricultural Development (IFAD) and ICRAF, the project plans to publish newsletters, poster series, and databases for researchers, extensionists, and practitioners concerned on soil fertility and fallow management of the upland areas in Southeast Asia.

Dr. Damasa B. Magcale-Macandog, assistant professor at the Institute of Biological Sciences, UPLB, heads this information support project. She is also the country coordinator of the Fallow Management Network - Philippines (FMN-P), and is assisted by Mr. Richard T. Yao, research associate.

The project intends to be active in the following arenas:

Linkaging

The project currently coordinates with the Indigenous Fallow Management (IFM) Network based at ICRAF regional headquarters in Bogor, Indonesia. The project has links with FMN-P, the Cornell International Institute for Food, Agriculture and Development (CIIFAD) and the University of the Philippines Los Baños (UPLB). Recently, the project has conducted a round-table-discussion with the Los Baños Science Community (LBSC) which focused on information sharing and the continuity of the project's thrusts after its completion. The project also aims to establish links with individuals, organizations and institutions around the world concerned on soil fertility and fallow management in Southeast Asia.



Framework of the Information Support Project.

Publications

The project believes that providing the needed information and avenues for exchanging soil fertility and fallow management ideas will build strong linkages among researchers, extensionists, educators, and policy makers concerned about the fragile uplands of Southeast Asia. The project will periodically publish a newsletter on soil fertility and fallow management in the uplands. Poster series featuring indigenous fallow systems in several Southeast Asian countries will be published by the project.

To enable the project to accomplish its goal, readers are requested to fill-out the attached two-page survey questionnaire inserted in this newsletter and mail it back using the attached envelope. It would only take 7 minutes to complete. The same

☞ *Next page*

questionnaire can also be downloaded from the internet <*http://www.geocities.com/fallownet*>, by clicking on "*Survey Questionnaire*". The electronic version of this newsletter and other information on soil fertility and fallow management can also be accessed and downloaded from the same web site. This web site will be hyperlinked to ICRAF-SEA web site <*http://www.icraf.cgiar.org/sea*>.

This site also houses the electronic discussion list on soil fertility and fallow management. The discussion list is in its take-off stage and is moderated by the project staff. At the moment, the list could be used as an avenue for topics on soil fertility and fallow management. List members are also encouraged to post related announcements, call for papers and updates. For more information on the list, please refer to the article on "Fallow Discussions on the Net" on the back cover page.

Databases

Aside from printed materials and the electronic discussion list, the project is also developing databases on the following:

- Directory of concerned individuals, organizations and institutions on soil fertility and fallow management in Southeast Asia
- Annotated list and photos of fallow species, occurrence, environmental requirements, specific management practices or technologies
- Compilation of references for fallow systems and soil fertility technologies with complete citation of abstracts of the papers.
- Annotated list of ongoing research on fallow systems and soil fertility management in Southeast Asia

By providing the most needed information and avenues for exchanging ideas on soil fertility and fallow management, the project can help strengthen linkages among those involved in alleviating poverty among upland farming communities in Southeast Asia.

The 'Agroforestry Knowledge Toolkit for Windows' (WinAKT)

Agroforestry practices, particularly traditional practices in the tropics, are complex. Information on such practices are frequently qualitative, sparse, and uncertain. The knowledge sources are dispersed, and though complementary at times, may be incompatible to a greater or lesser extent (compare, for example, the knowledge held by farmers with that held by research scientists). Development professionals who plan research and extension activities need to use such knowledge, yet established approaches to decision support tend to be deterministic and therefore demand more precise base information.

The 'Agroforestry Knowledge Toolkit for Windows' (WinAKT) software provides the user with an environment in which to create knowledge bases about a user-selected topic by collating knowledge from a range of sources. It facilitates the synthesis of that knowledge and its evaluation, and thereby facilitates its use in planning for agroforestry research and extension. This gives a powerful alternative to existing, less formal approaches to evaluating the current state of knowledge.

This article was accessed at <http://www.bangor.ac.uk/~afs40c/afforum/akt5/akt5_frame.htm>

Indigenous Pathways...

(Continued from page 1)

Can shifting cultivation be "sustainable"?

Alternatives to Slash-and-Burn Consortium indicates that a remarkably wide range of smallholder land use options are agronomically sustainable, depending on the larger environmental and economic context. However, household labor and land constraints are often limiting factors to intensification options.

Emerging strategies

In the past, relatively low population density and abundant forest cover provided a favorable base for sustainable shifting cultivation practices with long fallow periods, ranging from 10 to 60 years.

Slash-and-no-burn alternative

In parts of Papua New Guinea, the forest vegetation is cut but the underbrush is not burned. The cut branches and leaves are laid along the contour to provide erosion control as well as to slowly release nutrients from the decaying biomass. Food crops are then planted using minimum tillage practices, such as dibble or digging sticks.

Intensification

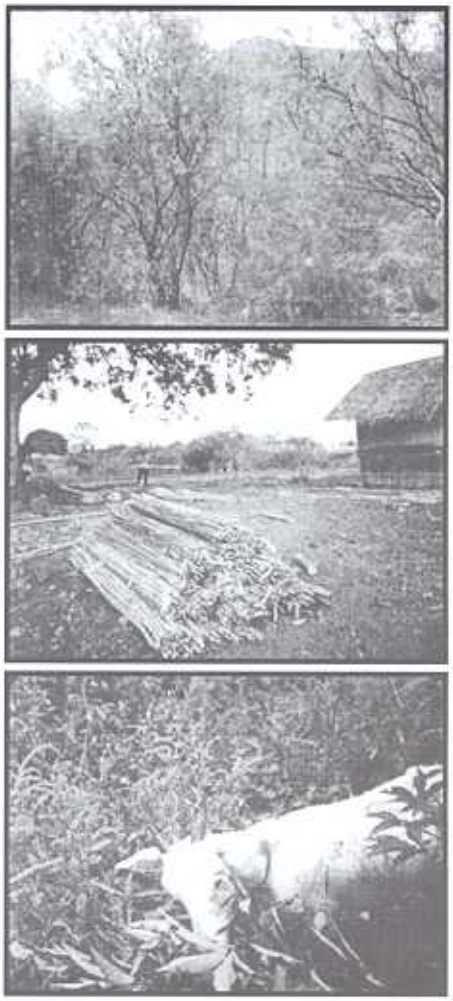
In our common quest toward developing more sustainable shifting cultivation practices, as well as alternatives to unsustainable slash-and-burn agriculture, most strategies now being employed are towards intensification.

One major challenge is to document and evaluate indigenous strategies for intensification of shifting cultivation through an integrated and iterative process of research and development. This process involves identifying promising indigenous practices, understanding them and the context in which they are used, validating their utility, extrapolating them to other locations, verifying them with key farmers in new areas, establishing their recommendation domains, and extending them more widely.

Indigenous strategies in the Asian context

Much of Asia is dominated by mountainous topography populated by diverse ethnic minority communities. Expansive forests and sparse populations allowed these mountain-dwelling communities to practice various forms of shifting cultivation, which enabled them to coexist in relative harmony with their environments. The annual cycle of slashing

☞ *page 4*



Top: *Leucaena farnesiana*, a leguminous fallow species, increases soil fertility on fallowed plots in Jala-Jala, Philippines. *Middle:* Bamboo easily grows on fallow plots, providing upland households with income from selling bamboo poles in Palawan, Philippines. *Bottom:* Fallow plots also serve as grazing area for small livestock animals (i.e., goat), and give upland farmers in Batangas, Philippines, added income from selling goat meat.

Indigenous Pathways...

(Continued from page 3)

and burning that characterizes land preparation in shifting cultivation systems, however, has often been drawn criticized as being inefficient and a leading cause of tropical deforestation.

Detailed anthropological studies, starting with work by Harold Conklin in the Philippines, evolved a much more favorable assessment of shifting cultivation. They presented strong evidence to show that it is a rational farming system in the context of constraints and opportunities inherent in remote upland areas. They pointed to its long history as evidence of sustainability.

These studies argued that shifting cultivation is a land-use practice that does not want to destroy forests, but instead it generally reflects an

- indigenous knowledge accumulated through centuries of trial and error,
- intricate balance between product harvest and ecological resilience, and
- impressive degree of agrodiversity.

More recent studies point to the custodial role often played by shifting cultivation communities in preserving forest ecosystems and natural species and to the tight linkages between biological and cultural diversity. This suggests that efforts in biodiversity conservation will remain ineffective, until they broaden their scope to also address cultural conservation.

One cross-cutting issue of direct relevance to research and development priorities in Asia is identifying and disseminating successful indigenous strategies for managing fallow land in more productive ways. This will enable an intensified land use that provides a higher output per unit of land, labor, or capital investment. The resulting increased productivity will more ably support the growing population densities of the uplands and alleviate the pressure to convert remnant forests into agricultural land.

Indigenous pathways to intensifying fallow management

The approaches that farmers use to change their fallow management in response to intensification pressures may generally be classified as innovations to achieve:

- More 'effective' fallows — where the biological efficiency of fallow function is improved, and the same or greater production benefits can be achieved in a shorter time frame (e.g. weed suppression or soil fertility replenishment)
- More 'productive' fallows — in which fallow length remains the same or is actually lengthened as the farmer adds value to the fallow by introducing more economic species, or
- Combination of the two — where both biophysical and economic benefits may be obtained.

One of the most promising approaches to identify biophysically workable and socially acceptable technologies is to document and understand case studies of indigenous adaptations that are successful.

Unfortunately, there is little documentation of such indigenous innovations for the formulation of the national and international research agenda or to inform policy makers. Indigenous innovations are generally unobserved or misinterpreted.

The Indigenous Fallow Management (IFM) Network has been attempting to build a community of workers to fill that gap. The publication '*Voices from the Forest* (Cairns, 2001) contains a large and fairly comprehensive review of many systems.

Indigenous knowledge of shifting cultivators

There is a wide menu of components from which shifting cultivators may choose to intensify land use. The salient point is to understand the array of farmer-generated solutions that have successfully permitted an intensification of shifting cultivation in the face of increasing land use pressures.

Article condensed by D.B. Magcale-Macandog and R.T. Yao from "*Shifting Cultivation in Asia: Diversity, Change, Indigenous Knowledge and Strategies*" by Dr. Dennis P. Garrity and Mr. Chun K. Lai. *In:* Shifting Cultivation: Towards Sustainability and *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 International Institute of Rural Reconstruction. 2001.*

About the authors:

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Fallow Systems in the Philippines: Benefits, Driving Forces, and Diversity

Damasa B. Magcale-Macandog and Richard T. Yao

Fallowing is a common practice among upland farmers in the Philippines. Native vegetation is allowed to flourish during the fallow period. Fallow is the resting of the soil or field from cultivation for a period of 6 months or more. In the tropics, fallow areas include secondary forest, abandoned cropland, pasture or degraded wasteland, and the intervening time between cropping periods of the farmland.

Farmers decide to fallow their land when weeds become dominant, the soil becomes hard and sticky, red ants overrun the farm, and the crops become stunted and yellow.

Several benefits may be derived from fallowing the land:

- Restoration of soil fertility
- Erosion control
- Suppression of weeds through forest regrowth
- Disruption of pest and disease cycles
- Provision of forage for livestock
- Source of firewood
- Source of materials for house construction
- Source of materials for making crafts
- Source of herbal medicine
- Generation of income from the sale of specific products
- Source of domesticated, semi-domesticated, or wild forest plants
- Mitigation of climate change through sequestration of carbon in tree-based fallow systems

Plant species, fallow management, and length of fallow rotation significantly influence the site's recovery and soil fertility status. The nature or kind of fallow vegetation determines the length of fallow period necessary to restore soil fertility. Compared with legume-based fallows, grass-based fallows requires longer time to restore soil fertility.

A number of indigenous and improved fallow systems have been documented. Broadly, these can be categorized into tree-based, shrub-based, herbaceous, and grass-based fallow systems. Trees, shrubs, and herbaceous plants from the legume family are the most common species which, when included in fallows, can significantly shorten the fallow period. The most common leguminous tree found in both

Documented fallow management systems in the Philippines.

indigenous and improved fallow systems is *Leucaena leucocephala*. It is found in the traditional *Naalad* indigenous fallow system and in the *Hanunuo-Mangyan* swidden farms in the Philippines. *L. leucocephala* is also commonly found in the introduced contour hedgerow systems designed primarily to control soil erosion in sloping farms.

Although fallowing has been an age-old practice in the Philippines and several technologies have been developed to improve fallow system management, a systematic study on fallow systems anywhere in the world is still wanting and is still in its infancy stage. The aim of this review is to present the documented fallow systems in the Philippines and other on-the-ground fallow systems that were observed in the field.

☞ page 12

Evolving Soil Fertility Management Practices

Coen Reijntjes

Soil fertility management (SFM) is the basis for achieving sustainability of agricultural production systems. Many different practices influence soil fertility — fallowing, application of organic or synthetic fertilizer, green manuring, mulching, burning, soil tillage, soil and water conservation, crop rotation, and animal and tree integration.

Every farming system has its own unique way of SFM, depending on a combination of factors: the condition of the natural resource base; available land, labor, and capital resources; history of local farming; farmers' knowledge, their motivation, skills, and degree of market orientation; relative prices of inputs; and agricultural policy.

Several broad categories of farming systems may be identified, each with characteristic SFM practices. These include

- Shifting cultivation and fallow systems based on natural processes of soil fertility regeneration;
- Interactive pastoral and fallow systems based on nutrient harvesting by animals and fallow vegetation;
- Integrated and organic agriculture typified by recycling of nutrients; and
- Modern agriculture in which synthetic fertilizers and mechanization control SFM.

Within and between these categories is a wide diversity of practices.

Changing SFM practices

SFM practices are being continually modified as conditions change. As population pressure increases and land becomes scarce, SFM shifts from extensive to intensive. A framework of typologies of indigenous fallow management was developed based on case studies presented during the Conference on Indigenous Strategies for the Intensification of Shifting Cultivation in Southeast Asia held in Bogor, Indonesia. This framework provides a continuum of indigenous intensification strategies in shifting cultivation.

An example of evolving SFM is the intensification process of the Mangyan shifting cultivators in Mindoro, Philippines. The traditional strategies of using natural processes to manage crops and fallow vegetation provide options for increasing production in a sustainable way. One of these options is the replacement of slash-and-burn practices by slash-and-mulch practices.

Farmers are exploring alternative SFM strategies due to various factors. These driving forces of SFM evolution include the following:

- population increase,
- scarcity of arable land,
- market,
- decreasing yields, and
- soil degradation.

Practices fit specific conditions

Each SFM strategy fits but also needs specific conditions, farmers adopt those practices that best fit their conditions. Subsistence farmers in Nepal cannot afford and sometimes have no access to synthetic fertilizers, depending only on natural means of SFM such as use of green manure. Green manures or cover crops can successfully replace or complement synthetic fertilizers or slash-and-burn practices. Where labor is scarce or relatively expensive, farmers cannot afford the labor required for intensive recycling of organic waste. The relationship between different farming systems/SFM strategies and the different types of conditions under which farming is carried out in the mountain valleys was illustrated in Ecuador.

Soil nutrient mining and pollution

Today's pressing issues are the ecological sustainability of agriculture and the search for ways to increase production. The Nutrient Monitoring (NUTMON) model nutrient balance study in Kenya showed that farmers who participated in nutrient management programs obtained about 30% of their income from nutrient mining.

However, in other places, nutrients are lost through the sediments washed out in soil erosion, as organic waste in city areas, leached into the groundwater and volatilized in the air. All these cause pollution.

Synthetic fertilizers are frequently used in an unbalanced, inefficient, and hence, polluting way, leading to soil degradation and declining yields. Each kilogram of synthetic fertilizer used corresponds to an approximately equivalent amount of nutrients contained in organic matter.

Sustainability threatened

Despite the severity of sustainability problems, there are no broadly based studies on the many processes involved in agricultural sustainability. It was only in 1995 that the International Rice Research Institute (IRRI) initiated a major study on reversing trends of declining productivity in intensive irrigated rice systems in eight countries. The study analyzed what is going on and attempted to design alternative strategies to current practices. Having this scenario, a much broader study should be conducted to analyze all the problems involved in the use of synthetic fertilizers and their socioeconomic and cultural implications.

☞ page 17

Applying Participatory Rural Appraisal (PRA): Outputs and Lessons from the Baguio Workshop

Damasa B. Magcale-Macandog and Richard T. Yao

A methodology workshop on participatory rural appraisal (PRA) was conducted by the SEAMEO Regional Center for Graduate Study and Research in Agriculture (SEAMEO-SEARCA) in collaboration with the Ecosystems Research and Development Service – Cordillera Autonomous Region (ERDS-CAR). This workshop, entitled Fallow Management Systems Documentation and PRA Methodology, was held on 17-19 May 1999 at ERDS-CAR regional office in Baguio City, Philippines. The Cornell International Institute for Food Agriculture and Development (CIIFAD) of Cornell University, USA funded the workshop.

Discussions on the application of PRA for documentation of fallow systems were a major part of the workshop. The importance of PRA and its major tools used for the conduct of documentation activities were presented.

The PRA site

Baguio is about 260 km north of Manila and is one of the major vegetable-producing areas in the province of Benguet. The province is the most popular upland agricultural area in the Philippines. Vegetables, tree crops, and rice are the major crops cultivated in this area.

To gain actual experience in using PRA tools and techniques, workshop participants had a practicum in the sub-village of Kedeng in the municipality of Sablan, Benguet, Philippines. The PRA site is located in the south central part of Benguet, nestling on a 1,500-meter high plateau in the Cordillera mountain range of northern Luzon.

The climate in Sablan is cool and crisp and offers a fine respite from the dust, heat, and bustle of the nearby lowland areas. It has only two seasons of about equal duration throughout the year — the wet and dry seasons. The dry season begins in November and ends in April and the wet season extends from May to October. Temperature ranges from 15 to 26 °C.

PRA tools and outputs

The PRA practicum participants walked across the area and met with village key informants. The participants were grouped into several teams, with each team assigned a specific activity. The activities include doing interviews to get data on general agricultural profile of the site, transect mapping, community resource mapping, and construction of time line.

The PRA tools used for fallow documentation were **community map**, **semi-structured interview**, **transect line**, **seasonal calendar**, and **timeline**. The activities and outputs of the five PRA tools applied in this workshop could be found in the next two pages.

What is PRA?

Participatory rural appraisal (PRA) is a systematic, semi-structured approach and method of assessing and understanding village situations with the participation of the people and through the eyes of the people. The process is facilitated by a multidisciplinary team of experts. PRA enables the local people to

- do their own investigations,
- share their knowledge,
- plan and own the outcome, and
- shift the initiative from outsider to villager.

The PRA methodology has 3 pillars:

- attitudes and behavior,
- methods-tools, and
- sharing.

Why PRA?

- PRA offers a way by which outsiders and villagers attempt to discover the situation through a process of joint observation, interaction, and shared analysis.
- There is a need to understand and appreciate traditional management systems.
- It is thought that no development initiatives would succeed if it is not in accordance with the beliefs and values of the community.

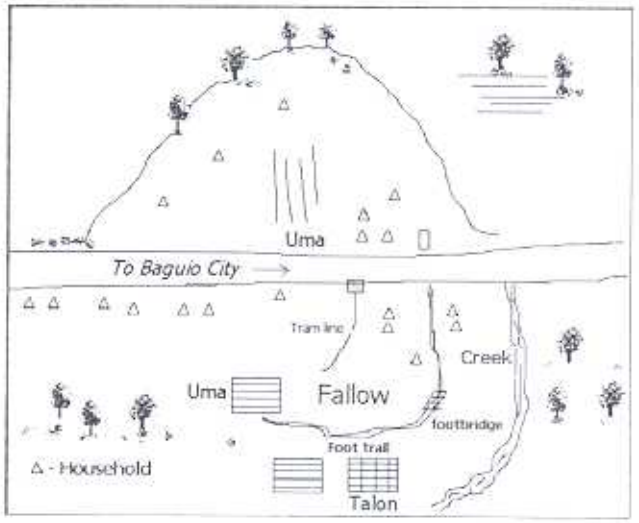
Left: Initial site investigation of the PRA Team. *Right:* Some common vegetation in the Kedeng sub-village, in Sablan, Benguet, Philippines.

Applying PRA:...

(Continued from page 7)

Community map

Activity	Output
Key informant interview with 23 women residents	Updated community base map



Semi-structured interview

Activity	Output
Guide questions were used in a casual interview with identified farmer respondents.	Understanding fallow and farming practices and how these affect the household income.

Q: What is the local term for fallow?
R: Ibaloy dialect, fallow is termed as "pan-inabudaday". (The respondent knows the meaning and purpose of the fallow process.)

Q: What are the reasons for fallowing?
R: Fallowing is done to let *Flemingia macrophylla*, a leguminous tree, grown to improve soil fertility. This is because in the "alaksiang" or hilly area, there is not much rain and cropping in the sloping area depends on rainfall.

Q: Why is there a need to fallow?
R: When crop yields decline, the land needs to be fallowed to regain soil fertility.

Q: What time do you usually fallow?
R: Fallowing is done during the dry months from November to April.

Q: How do you know when the fallowed area can already be cultivated?
R: When the rainy season starts, it is time to cultivate the land.

Q: What activities are done when cleaning the fallowed land?
R: There are many activities during the cropping period. These include weeding, plowing, and cultivation. This practice is done by capable members of the household.

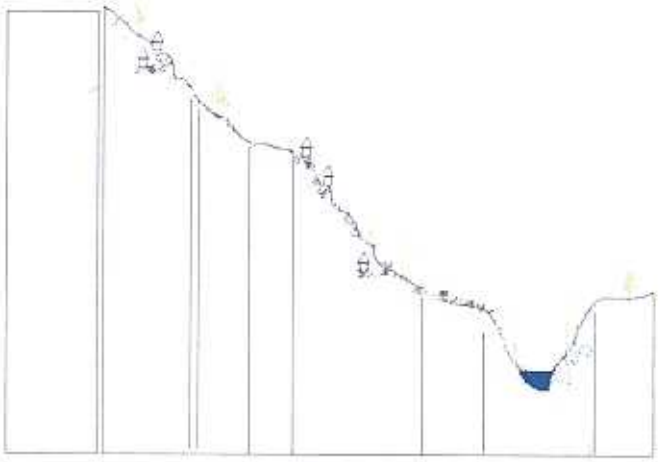
Q: What is your usual farm income?
R: Income from the sale of harvested beans is quite good. Sale of beans can reach up to P18,000 ($350) per season and bean cultivation is usually done twice a year. Pineapple produced in the farm is mainly for home consumption. One can earn about P5,000 ($98) per year from selling cutflowers like gladiolus. Other income sources include off-farm work worth about P5,000 ($98) per month.

Q: What happens to the land under fallow?
R: The farm's soil fertility increases.

Q: What are the benefits derived from fallowing?
R: Increased crop yield.

Transect line

Activity	Output
Illustration of the transect line, quick ocular inspection of the area. A farmer leader was to join the walk through the area to provide the necessary information while walking.	Identification of the major zones, vegetative cover, fallow species, soil type, livestock, etc. in the site. Identification of the agroforestry systems used in steep areas.



Soil	Alaksiang	Simpa	Alaksiang	Simpa	River Banks	Simpa
Crops			Vegetables	Banana Rice	Bamboo	Beans
Trees	*Flemingia macrophylla*		Fruit trees *Flemingia sp.* Hard woods			
Fallow Species	*Macaranga amentos Chromolaena odorata*					
Livestock		Goat Chicken		Carabao		Carabao
Problems			Poor access Soil erosion	Poor access		Poor access
Opportunities	Agroforestry (AF)	AF	AF	Intensive vegetable cropping		Intensive vegetable cropping

Alaksiang - area where many households are settled, has clayey soil
Simpa - leveled terrace, has friable soil

Seasonal calendar.

Activity	*Output*
The group was asked about the crops grown for a one-year cropping period.	Individual seasonal calendars. General farm calendar for the community was derived from these individual cropping calendars.

Farming system	J	F	M	A	M	J	J	A	S	O	N	D
Intensive agriculture (Swidden)	C	B	B	P		H	H	H				C
(corn, vegetables, banana, sweet potato, ginger)												
Irrigated rice farming			L	L/P	P					H	H	L
Gardening	P			H	H	F	F	F	F	F	F	F
Tiger grass	H	H				P						H

C-clearing, ***B***-burning, ***F***-fallow, ***P***-planting, ***H***-harvesting, ***L***-land preparation.

Applying PRA:...

(Continued from page 8)

Timeline for cropping and fallow system

Activity	*Output*
PRA facilitators mobilized local women to recall important events and trends over the past five decades.	Milestones in cropping and fallow systems in the area.

Decade	Events and Trends
50s	• Majority of the areas were public lands • Plenty of wild animals (e.g. deer, wild boars, etc.) • Grassland: *Miscanthus sinensis* (known as *runo*) • Bamboos (*Bambusa sp.*) • Forest was still intact (dominant forest tree species was *Shorea contorta* or white lauan) • UMA, the indigenous upland farming system similar to swidden, practiced in most farms. • Organic farming was adopted by farmers. • Major crops: *Musa sapientum, Ananas comosus, Colocasia esculenta* and *Oryza sativa*
60s	• Deforestation began/quest for land occupation (law prohibits issuance of land titles to forested areas, titles can only be issued to cultivated areas; hence, locals cleared forest to secure land titles • Land titling began • Kaingin started (land development) • Fallow period shortened • A new crop, *Sechium edule*, locally known as "sayote" was introduced and widely adopted by farmers • Vegetables (i.e., *Brassica chinensis*) was cultivated for home consumption
70s	• Reforestation of pine trees (*Pinus* sp.) • Households began planting pine trees • Commercial production of fruits and vegetables started • Use of chemical fertilizers led to the decreased practice of fallow
80s	• Fallow period was shortened to 3-5 years — UMA • Organic farming renewed • Vegetable farming intensified
90s	• Very few farmers practiced fallow • Vegetable production in UMA started

Participants in the Methodology Workshop on Participatory Rural Appraisal conducted by SEAMEO-SEARCA in collaboration with ERDS-CAR. This workshop was funded by CIIFAD.

Lessons learned

1. PRA is useful for exploratory investigations. Results can be used for identifying research and extension agenda in the site. Moreover, other methodologies such as structural and experimental research and actors-in-context analysis can be incorporated with PRA for in-depth studies or research.
2. PRA results have to be validated with the target community for greater accuracy.
3. Ground preparation before conducting PRA is critical to of the survey's success.
4. Tasks for each member of the PRA team should be well organized and synchronized. One member should take down notes, another one faciljtate the discussion, another one do photo and audio documentation and another one collect specimens. Each member of the team should have a specific activity for each PRA tool. Furthermore, all the materials will be needed should be ready.
5. The timing or scheduling of the PRA should not coincide or be in conflict with farmers' activities.
6. To avoid domineering personalities in conducting PRA tools such as time line, distribute meta-cards and let each member write his/her own timeline. The facilitator should involve everyone in the activity. He/She should be sensitive to the reactions of other members of the group.
7. For household interviews, both husband and wife as well as other household members should be present . This is to collect accurate data, particularly on farm labor and household income.
8. Triangulation, like using different PRA tools, should be done to address inconsistencies in the information gathered.

References:

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Documentation of Indigenous Knowledge and Shifting Cultivation Practices in the Eastern Himalayan Countries

Atsuko Toda

The Centre for Integrated Mountain Development (ICIMOD) was established in 1983, amidst rising concerns about environmental degradation and poverty in the Hindu Kush-Himalayas (HKH). The Centre's focus spans 3,500 km of the Hindu Kush-Himalayan mountain range with its 140 million inhabitants, encompassing the mountain areas of Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan. ICIMOD is a regional multidisciplinary knowledge management institution based in Kathmandu, Nepal, and brings together networks of mountain scientists and researchers, national and local government institutions, NGOs and farmers to promote the development of an economically and environmentally sound mountain ecosystem and to improve the living standards of mountain populations of the Hindu Kush-Himalayan area.

The Mountain Farming Systems Division of ICIMOD aims to (i) document compelling examples of shifting cultivators that have successfully managed the practice as an integral part of the upland farming system, and (ii) illustrate the contribution of indigenous knowledge in the management of natural resources in the eastern Himalayas. The documentation process involves

(a) documenting and evaluating indigenous strategies in shifting cultivation system in the eastern Himalayan region;

(b) understanding the most promising indigenous practices and human adaption mechanisms in the context which they are used; and

(c) illustrating experiences of productive fallow management and shifting cultivation systems.

Documentation will cover Myanmar, the Chittagong Hill Tracts of Bangladesh, Bhutan, and northeast India. Gender will be given particular emphasis, since it is known that women play a primary role in subsistence farming in upland areas. Findings from this activity are envisioned to lead to a 'farmer-based workshop', which would be an opportunity for interface between researchers, farmers, and practitioners in each of the four target countries. In addition, a regional policy workshop to disseminate findings and influence policy makers' perspectives about shifting cultivation will be held in Shillong City which is located in the northeast part of India.

ICIMOD is in search of individuals or institutions to act as focal points for documentation of indigenous knowledge and farmers' innovations in shifting cultivation in each of four countries. Interested individuals are encouraged to contact ICIMOD not later than 15 February 2002, through email or postal mail.

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ICIMOD's Objectives and Function

ICIMOD is committed to improving livelihoods of mountain women and men in the Hindu Kush-Himalayan region and giving them a voice.

The ICIMOD primarily aims to help promote the development of an economically and environmentally sound mountain ecosystem and to improve the living standards of mountain populations, especially in the HKH region. In pursuing its mandate, ICIMOD works mainly at the interface between research and development and acts as a facilitator for generating new mountain-specific knowledge relevant to mountain development. ICIMOD also attempts to ensure the sharing new knowledge among all relevant institutions, organizations, and individuals in the region. As such ICIMOD functions as

- a multidisciplinary documentation and information center on integrated mountain development;
- a focal point for the mobilization, conduct, and coordination of applied and problem-solving research activities;
- a focal point for training on integrated mountain development with special emphasis on the development of relevant training materials for the training of trainers; and
- a consultative centre to provide expert services on mountain development and resource management to the HKH countries.

For more info on ICIMOD, visit: <www.icimod.org.np>

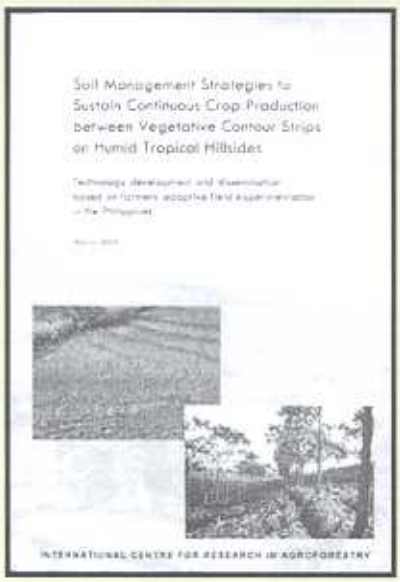
Soil Management Strategies ...

(*Continued from page 11*)

Validating and Adapting NVS Technology

Recently, research has been initiated to validate and adapt the NVS technology, along with improved soil fertility management practices, under the contrasting conditions of the shallow, calcareous soils typical of central Philippines. This is another major soil environment, common in several countries in Southeast Asia, including eastern Indonesia, parts of Vietnam, and southern China. Under shallow soil conditions in this environment, strategies that reduce soil movement, such as minimum tillage and improved fallows, require more attention. The refinement of the NVS technology and associated soil fertility management strategies under a range of contrasting soil conditions will allow the extrapolation of this low-cost soil conservation technology to a wide range of upland environments in Southeast Asia.

For more information, please see:
Stark, M. 2000. Soil management strategies to sustain continuous crop production between vegetative contour strips on humid tropical hillsides: technology development and dissemination based on farmers' adaptive field experimentation in the Philippines. Bogor, Indonesia: International Centre for Research in Agroforestry, Southeast Asia Regional Research Programme.
Or contact Marco Stark at *<mstark@mozcom.com>*



Fallow Systems in the Philippines:...

(*Continued from page 5*)

Indigenous Fallow Systems

Traditional fallow systems such as the Tiruray and the Tagbanua tree-based systems are sustainable and in harmony with the forest environment. Tiruray and Tagbanwa systems have very long fallow periods that allow the regeneration of the secondary forest, which is an integral part of these swidden systems. The diverse fallow species in these fallow systems are potential sources of products that could serve as sources of cash income, raw materials for crafts, timber for construction, and medicine.

Driving Forces

These traditional fallow systems have been modified over time. Several forces have driven the evolution of different fallow systems in the Philippines. Population pressure and the necessity to meet the food demands of the population have forced farmers to intensify the cropping phase and ultimately shorten the characteristic long period of fallow in the traditional sustainable shifting cultivation systems.

The main purpose of fallowing the land is to restore soil fertility levels. Improvement of fallow systems through the introduction of herbaceous legumes (*Pueraria phaseoloides, Vigna radiata, Glycine max, Arachis hypogaea* and *Vigna sinensis*), leguminous shrubs (*Mimosa invisa* and *Calopogonium mucunoides*) and fast-growing leguminous trees (*L. leucocephala* and *Gliricidia sepium*) has been observed in several fallow systems in the Philippines.

Soil fertility was restored in a much shorter time frame using legume-improved fallows, in contrast to the traditional fallow systems in which the native vegetation is allowed to regenerate naturally during the fallow period. Soil fertility recovery was hastened through the incorporation of leaves into the soil as green manure and mulch to protect the soil from erosion. Some nonleguminous shrubs such as *Chromolaena odorata* are allowed to proliferate in fallow areas due to their beneficial effect on the build up of organic matter in the soil.

The government's concern for soil erosion control in the Philippine uplands was a major driving force in the widespread introduction and proliferation of hedgerow

☞ *page 14*

Far left:: cover of the book by Marco Stark. *Left:*: A *Leucaena* forest formed during the 6-year fallow period of the Naalad fallow system in Naga, Cebu, Philippines. Using fallow system is one way of restoring soil fertility.