

The **Indigenous Knowledge and Development Monitor** promotes the dissemination of local knowledge as a service to the international development community and all scientists who share a professional interest in indigenous knowledge systems and practices. The journal is published three times a year by CIRAN—the Centre for International Research and Advisory Networks, a department of Nuffic (Netherlands organization for international cooperation in higher education) as part of its Indigenous Knowledge Information System.



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Editorial

At the close of 1999 many good wishes were exchanged. Not only did we wish each other happiness and prosperity in the year to come, but also in the new century and even the entire millennium! That may have been going a bit too far. We'd do better to limit our 'great expectations' to the present decade!

Great expectations: the title of a novel by the famous English writer Charles Dickens, in which he recounts the trials and tribulations of a young boy named Pip. It is thanks to Dickens' mastery of the word that we see the nineteenth-century world through the eyes of Pip. He is a poor orphan brought up 'by hand' by his brother-in-law Joe Gargery. Dark romanticism colours the opening passage of *Great Expectations* we see Pip in the graveyard where his parents and five of their infant children are buried. There he meets up with a Convict, a terrifying figure wearing a leg-iron, who turns Pip upside down to empty his pockets, which contain only a piece of bread. The Convict gobbles up the bread and then forces Pip to help him get rid of the leg-iron. It is clear that Pip lives in a harsh world, but there are two things that keep him going: his own good intentions, and the good intentions of the down-to-earth people he meets along his path. They are people like the cheerful clerk Mr Wemmick and his delightful old father, 'the Aged P(erson)', who have an innate dignity and—whether they know it or not—a sense of humour. This helps them to view the world as a good place to be, in spite of setbacks and disappointments. Let us hope that all of us, no matter where we live and no matter how difficult our circumstances, have our own great expectations. And that with any luck, they will be realized in the course of the first decade of this new millennium.

Here at Nuffic-CIRAN we have our own great expectations—for the new Indigenous Knowledge Information System, for example. You can read about it on the inside front cover in the new **Focus**. And of course great expectations are also to be found in the other pages of the issue of the Monitor before you. There are three articles: Hilde van Vlaenderen examines the problem-solving solutions used by young people in South Africa. Understanding a problem and devising your own solution is the first step towards true independence.

The article by E.U.U. Ituen and I.V.O. Modo also has to do with a problematical situation, but at the same time it points the way to great expectations, too. The authors examine which of the various methods of palm oil production are the easiest or most efficient under the given circumstances.

The third article takes us to India. Authors Parvathi, Chandrakandan and Karthikeyan map women's knowledge and experience in the area of post-harvest operations. They focus on the search for more efficient methods of preparing the dryland produce for storage, and the need to key the improvements to the 'great expectations' of the poor farmers who eke out a living on these lands.

The other features and communications in this issue contain news on the theory and practice of harnessing indigenous knowledge to sustainable development. At the very end you will find a remarkable example of IK in practice. And not only practice, but policy as well! Guest columnist Dr Z.E. Nyiira relates how delegates from various Ugandan organizations joined in a workshop last December in Kampala. Their aim was to formulate a national strategy—and a framework for practical action—designed to place IK in the service of the search for sustainable development.

Editorial address

Nuffic-CIRAN, P.O. Box 29777
2502 LT The Hague
The Netherlands
Tel.: +31-70-4260 324
Fax: +31-70-4260 329/4260 399
E-mail: ikdm@nuffic.nl
<http://www.nuffic.nl/ciran/ikdm>

Editor

Anna van Marrewijk

Editorial Board

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pp. 21-25.

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Netherlands organization for international
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Since February 1993, the *Indigenous Knowledge and Development Monitor* (IK&DM) has been promoting the dissemination of local knowledge as a service to the international development community and to all scientists who share a professional interest in indigenous knowledge systems and practices. The journal is an instrument for the exchange of information required for integrating indigenous knowledge (IK) into global science.

T

Indigenous or local knowledge is knowledge that is unique to a given culture or society. It is seen to contrast with the knowledge generated within the international system of universities, research institutes and private firms. Indigenous knowledge is used at the local level by communities in developing countries as the basis for decision-making pertaining to food security, human and animal health, education, natural resource management, and other vital activities.

The IK&DM is published by CIRAN—the Centre for International Research and Advisory Networks, a department of Nuffic (Netherlands organization for international cooperation in higher education).

C

The IK&DM has two main sections. The articles section offers practice-oriented accounts of research into indigenous knowledge systems all over the world. The articles discuss the policy implications of incorporating IK into development efforts, and make recommendations to this effect. The communications section presents news and notices in ten sub-sections: IK resource centres; Calls; Conferences; Networks, international organizations; Research, projects; Publications; Mailing lists; Websites; Databases; and Films and audio-visual devices.

O

The Editorial Board has a majority of members from the developing world. This reflects the journal's policy of encouraging contributions from the South. The Indigenous Knowledge Resource Centres in Africa, Latin America and Asia have always played a crucial role in providing this invaluable, demand-driven input. They continue to mobilize information for publication in the IK&DM, but their efforts are increasingly being supplemented by those of other organizations and individuals throughout the world. New channels for the flow of information have opened up as a result of the widespread distribution of the journal in developing countries, the growing impact of the Monitor online, and the Indigenous Knowledge Information System which Nuffic-CIRAN has recently started.

I

Indigenous Knowledge Information System

The Indigenous Knowledge Information System provides easy access to information that is relevant for sustainable development. The idea behind the Indigenous Information System is that indigenous knowledge can prove widely applicable and valuable only if it is made known and can be validated around the world. The system at present has the following components:

- IK pages, offering links to relevant information on indigenous knowledge which can be found on the Internet: <http://www.nuffic.nl/ik-pages/>
- IK resources, offering direct information in the form of notices, reports and articles which can be browsed through and searched online: <http://www.nuffic.nl/ik-pages/ik-resources>
- Indigenous Knowledge and Development Monitor online, offering all issues of the journal in complete form: <http://www.nuffic.nl/ciran/ikdm/>
- News and announcements dealing with indigenous knowledge systems and practices: <http://www.nuffic.nl/ik-pages/news>
- Mailing lists to facilitate discussion and exchanges of information on specific topics such as biodiversity and animal production and healthcare: <http://www.nuffic.nl/ik-pages/maillinglists>
- Best Practices on Indigenous Knowledge, a database maintained in cooperation with UNESCO as part of its MOST programme (Management of Social Transformations) <http://www.unesco.org/most/bpikreg.htm>
- A worldwide database containing information on indigenous knowledge experts in various policy sectors and disciplines.

Nuffic-CIRAN will continue to build up and develop the IK Information System as a way of helping to generate 'knowledge for development'. This effort is based on the conviction that sustainable development will be achieved only through a worldwide sharing of information that results in blending local knowledge with insights derived from modern science and technology.

Guus W. von Liebenstein
Director CIRAN

Anna van Marrewijk
Editor IK&DM

Problem solving: a local perspective

In situations of socioeconomic change, development relies largely on the generation of problem solving strategies. Development programmes should therefore be based on local understanding of the notion 'problem solving' and on indigenous problem solving skills. This article presents the results of a study focusing on people from rural towns in the Eastern Cape region of South Africa.

People-centered development is based on the conviction that people are capable of directing their own development process, consistent with their aspirations. It stresses the importance of anchoring development programmes in local knowledge and local skills. According to David Korten (1990:67) people-centered development involves a process by which the members of a society learn to mobilize and manage resources, in order to produce sustainable and equably distributed improvements to their quality of life. This definition implies that for people-centered development to succeed, individuals must be empowered to participate in their own development process. The author argues that empowerment must be rooted in the knowledge of the people, and in ways of dealing with their environment which they have successfully used in the past. Building on local knowledge and resources reduces the likelihood that a development intervention will 'de-skill' people or increase their dependence on external experts (Korten 1980). On the contrary, building on local knowledge empowers people by increasing their self-reliance (Van Vlaenderen, in press).

One of the core issues in development is the capacity to solve problems arising from changing socioeconomic conditions. As Korten notes, empowering people in their development means reinforcing their existing problem solving capacity (Gilbert & Van Vlaenderen 1995). To that end, development programmes should be informed by people's local understanding of the concepts 'problem' and 'problem solving'. This article reports on research into local knowledge of the concepts 'problem' and 'problem solving' in a group of young Africans involved in grassroots development in semi-rural towns in the Eastern Cape region of South Africa.

Research

Much of the information gathered was destined for a development course run by the Eastern Cape Development and Funding Forum (ECDAFF) during February 1993. The data were collected over a period of five weeks, during which a group of 14 participants conducted weekly problem solving workshops, and weekly individual interviews were held with a number of the participants. Interviews were subsequently held with another 14 people. Those participating in the workshops were inhabitants of townships (residential areas reserved for black people during the apartheid era) in small rural towns in the Eastern Cape Province. All were involved in community development work and belonged to a Local Development and Funding Forum (LODAFF), the local affiliate of the regional ECDAFF. All were nominated by their communities to represent them



at the course. There were 13 Xhosa first-language speakers and one Afrikaans first-language speaker. All had a good command of spoken English. With two exceptions, they were all young adults under the age of thirty at the time of data collection. All but three participants had completed secondary school.

An additional 14 participants were identified by the researcher via her local network of development work. The research aims were discussed with each prospective participant, as well as with the organization or project she or he belonged to. All those contacted expressed their willingness to participate. While the 14 additional participants did not belong to a LODAFF, they were associated with community development organizations in their area; they all lived in townships attached to small towns in the Eastern Cape. There were 13 Xhosa first-language speakers and one was an Afrikaans speaker; all had a good command of spoken English, and had a similar education background. These participants were somewhat older than the initial group; four were over the age of 30 at the time of data collection. More detailed information on the study can be found in separate publications (Van Vlaenderen 1998a; 1998b; 1999).

Interview data from 28 participants (12 women and 16 men) were interpreted, using a grounded theory approach (Glaser & Strauss 1967), providing insight into the participants' knowledge of the concepts 'problem' and 'problem solving'. This information, in the form of a series of figures, is presented here with explanatory notes and quotes from the interview data.

Participants in a problem solving workshop related to the present research.

Photo: Hilde Van Vlaenderen

Typology of problems

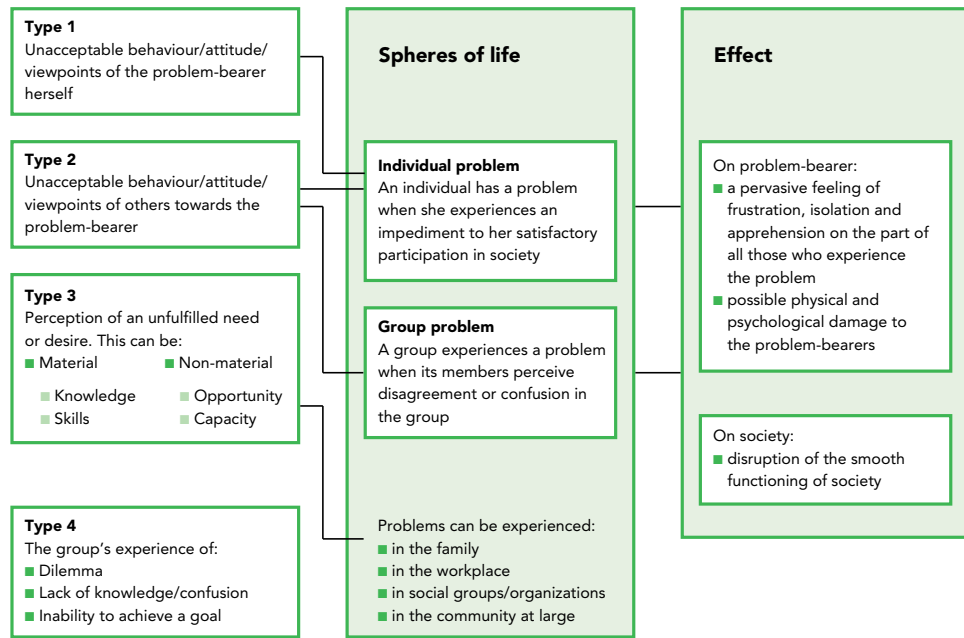


Figure 1. Local knowledge of the concept problem.

'Problem'

The participants' knowledge of the concept 'problem' is presented in Figure 1.

The participants clearly distinguish between a problem experienced by an individual and a problem experienced in a group. Problems are seen as inter-relational rather than intra-individual. Moreover, they are perceived in terms of unacceptable or deficient relationships between individuals or between an individual and society. The following quote illustrates this:

'Mixing with people may be a problem. If you discuss with people from different ideological backgrounds and you differ about something.'

(Pelia)

'Problem solving'

The participants' knowledge of the concept 'problem solving' is presented in Figure 2.

Problem solving is perceived as an inter-active process. This is evident from the following

interpretation of Figure 2. Problem solving was seen to involve various role players, whereby a distinction was made between those involved in the problem and the outsiders. Those involved include the 'problem-causer' (the individual who displays unacceptable behaviour) and those affected by that behaviour:

'People around you can cause the problem for you or it can be in yourself.'

(Nancy)

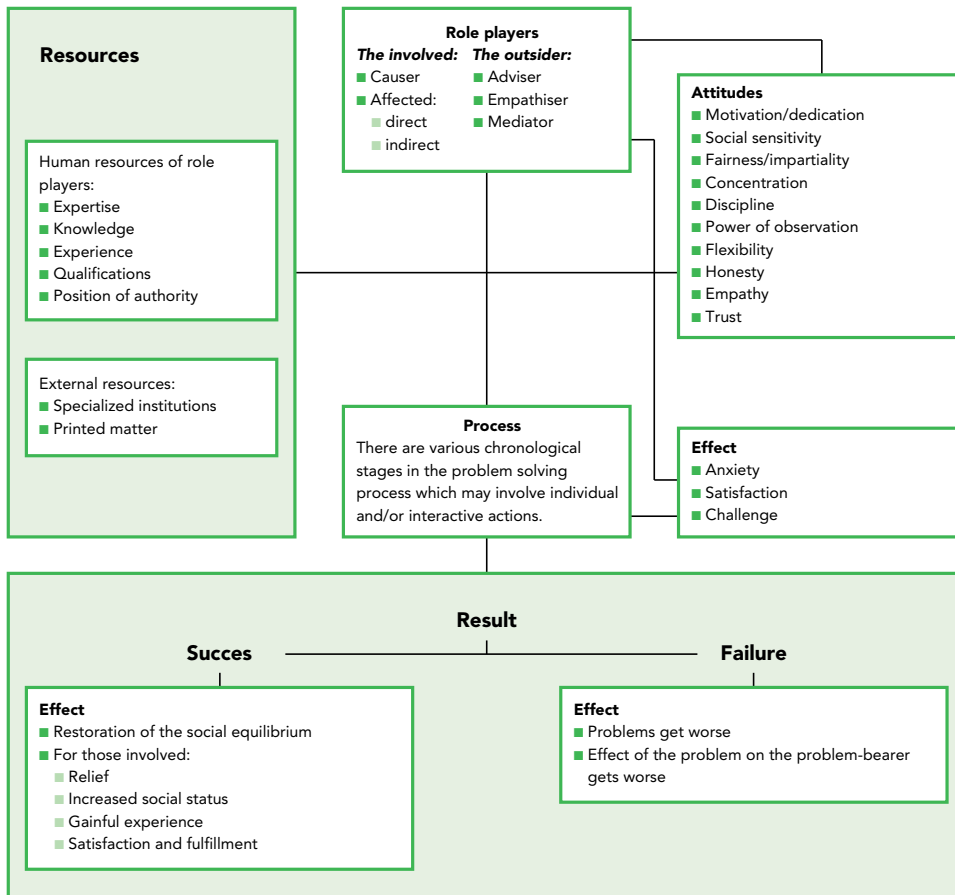
In group problem solving all the group members are simultaneously causers and affected. Sometimes a group member emerges as a leader and takes over the role of outside mediator. Several attitudes are considered necessary for successful problem solving.

These are mainly of an inter-personal nature and should be displayed by all role players:

'Your behaviour and attitude is important. You must be fair and reasonable.'

(Matthew)

Figure 2. Local knowledge of the concept problem solving.



'People who are sensitive and responsible (are good problem solvers).'
(Ayanda)

Problem solving involves phases in which the 'problem-bearer' acts on her own and phases in which there is interaction between the problem-bearer and some or all of the other role players. The more difficult the problem is perceived to be by the problem-bearer, the more interactive the problem solving process is, i.e. the more need there is for outside help. In the case of a group problem, the problem solving process involves all the group members throughout the entire process:

'Problem solving is participating. The whole group.'
(James)

The problem solving process makes use of resources. A distinction is made between human resources (those of the role players themselves) and external resources (those consulted by the role players). The importance of experience was emphasized, and a knowledge of similar problems which had presented themselves in the past:

'People who solve problems are people who have come across the problem before, experts on it.'
(Matthew)

Problem solving is a cognitive-affective experience. All those involved in problem solving experience certain emotions during the process:

'I like problem solving because it is a challenge, it keeps one going and one learns more.'
(Ayanda)

Problem solving fails when the role players are not serious and honest about the endeavour. If this happens, the problem and the effects of the problem will become progressively more serious:

'Some people kill themselves if their problems are not solved.'
(Nkosana)

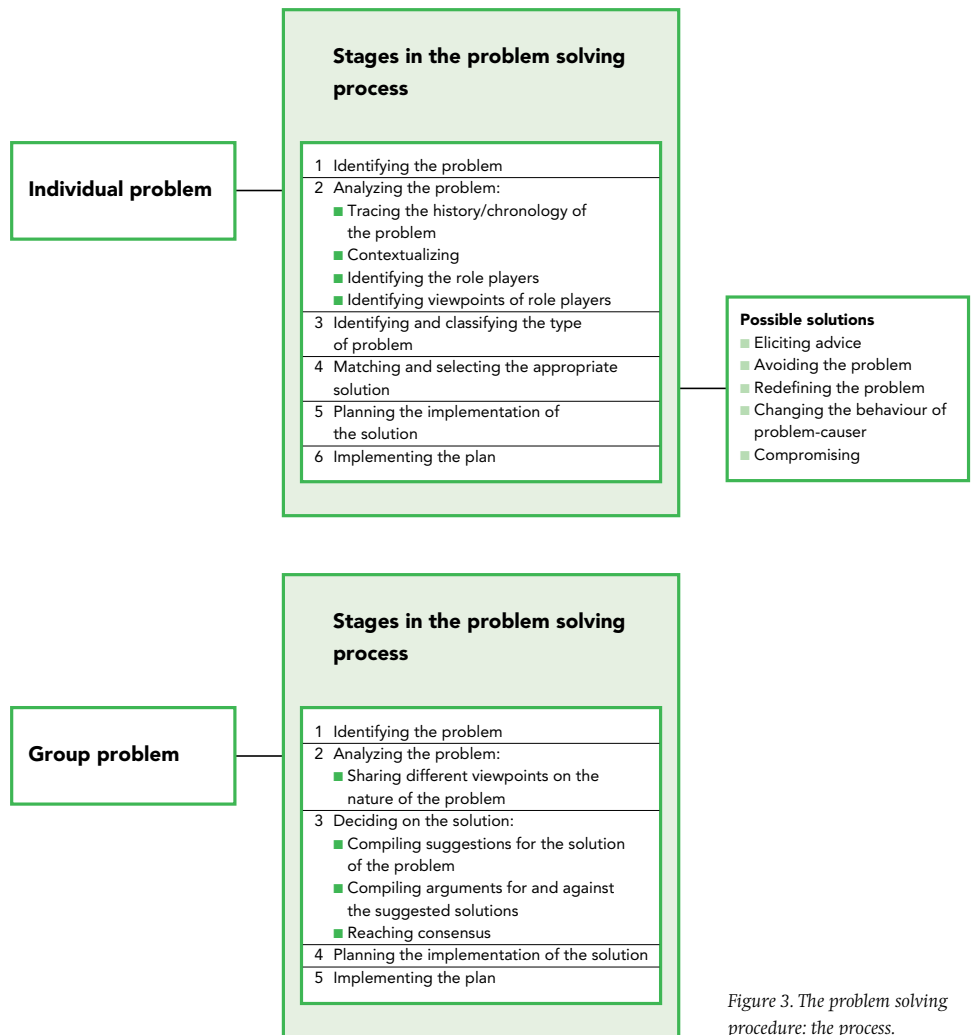


Figure 3. The problem solving procedure: the process.

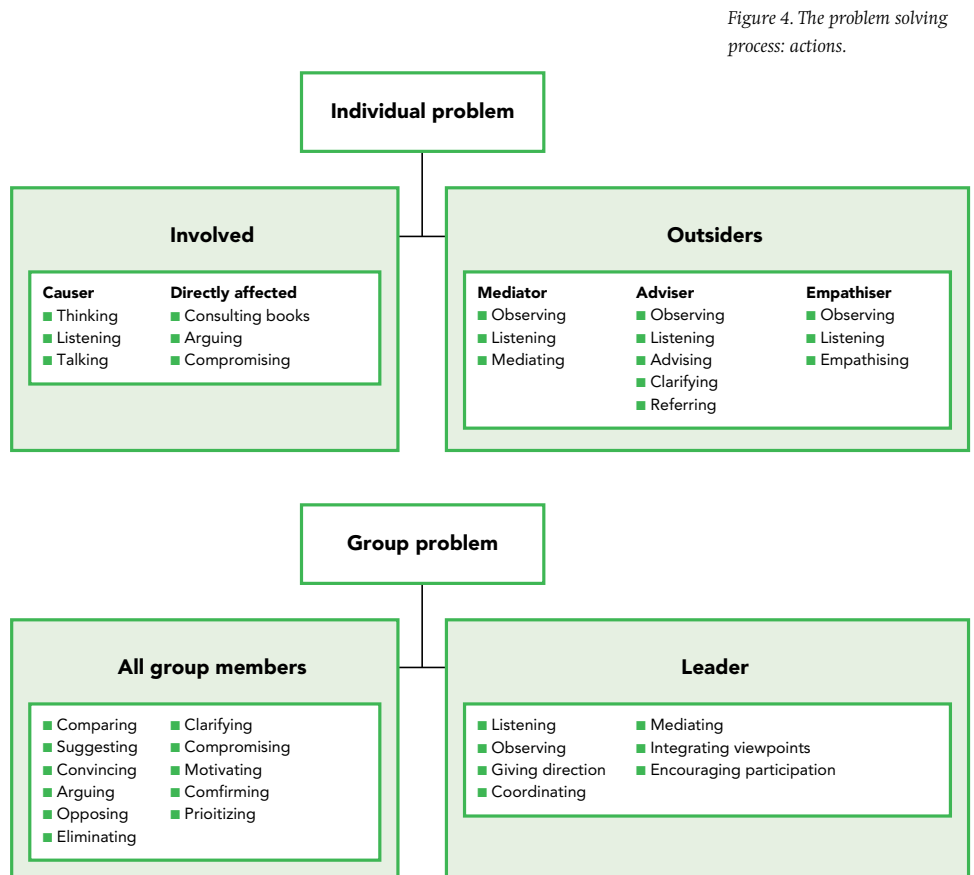


Figure 4. The problem solving process: actions.

Knowledge of the solving procedure

The participants' knowledge of the problem solving procedure is presented in Figures 3 and 4 (see page 5).

We see here that participants identified several chronological steps in the problem solving process. In both processes (individual and group), the most important step consists in identifying and analyzing the problem. It is considered important to embed the problem in its social context:

**'You identify the problem.
You look at the situation, at the environment,
at the people involved.'**

(Olifant)

In the case of an individual problem, the participants seem to assume that there are problem-specific solutions and that problem solving consists in retrieving those solutions:

**'You identify the type of problem
and take the solution which seems best suited to
the problem.'**

(Ayanda)

In group problem solving the focus is on finding a group consensus:

**'In the group you must try to
convince them and not to upset them.'**

(Belinda)

Figure 4 (see page 5) shows that a distinction was made between actions used to solve an individual problem and actions used to solve a group problem. In both processes, however, most actions are inter-active, with the main focus on listening, observing and talking, as well as on various specific ways of talking, such as suggesting or clarifying.

Conclusion

A further interpretation of the research data presented above sheds additional light on the participants' underlying knowledge of the concepts 'problem' and 'problem solving'. It is clear that they regard a problem as an interpersonal conflict, and that reaching and maintaining a state of social harmony is considered the main aim of problem solving. Their belief in the social construction of truth is in keeping with the principle of social harmony. They indicated the importance of shared problem identification and a joint search for a solution to the problem. Implicit in the participants' knowledge is the belief that each particular problem is a unique, socioculturally embedded issue. As a result their focus is not on developing formalized, universally applicable problem solving skills, but rather on the need to contextualise the problem, placing it against a background familiar to all those involved. Problem solving then involves an often emotional process of negotiation that takes into account all the circumstantial factors, and is aimed at reaching consensus on a solution for that particular problem.

It has been argued that if development programmes are to be successful, the people involved must have a knowledge of the concepts 'problem' and 'problem solving'. The present study was an attempt to illustrate this. The participants were involved in a training programme on leadership and the development of management

skills which was part of a development programme in the Eastern Cape region of South Africa. Insight into their understanding of the concepts 'problem' and 'problem solving' will help the organizing agency to embed the training in the participants' own knowledge and experience, rather than in Western theories on problem solving. This will enhance the effectiveness of the training and facilitate the transfer of skills from the training course to the participants' real-life situation.

Hilde Van Vlaenderen

Senior Lecturer
Department of Psychology, Rhodes University
0461 Grahamstown
South Africa
Tel.: +27-46-603 8504 / 5.
E-mail: H.VanVlaenderen@ru.ac.za
<http://www.rhodes.ac.za/academic/departments/psycho>

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The effect of the fermentation period on palm oil production in Eastern Nigeria, using traditional methods

In Nigeria most of the palm oil is produced by traditional methods. The three common methods of oil palm fruit processing differ mainly at the extraction level. All three involve the fermentation of the fruit before processing. A study was carried out to measure the effect of varying periods of fermentation on both the quantity and the quality of the oil. The results indicate that under the given circumstances the best results are obtained by three days of fermentation in combination with the use of the screw press.

Palm oil comes from the fruit of the oil palm *Elaeis guineensis* Jacq, and can be made either from the fruits themselves or from the nuts.¹ Chemically, palm kernel oil (PKO) is quite similar to coconut oil (Wiener *et al.* 1989). The edible form is flavourful even when used raw, and palm oil is also used cooking and for the manufacture of soaps, margarine, grease and candle.

In Nigeria many of the vegetable oil industries now rely on palm oil, because of the scarcity of oils from other plant sources, such as groundnuts. Most of the Nigerian palm oil is produced by traditional methods, which involve the fermentation of the oil palm fruits before processing. Here fermentation means storing the fruits for one or more days after harvesting, to allow them to loosen out of the bunches.

As elsewhere, fruits are sometimes processed without fermentation in Nigeria. This takes place in oil palm mills where the bunches are sterilized by steam in order to loosen the fruits. While this results in a high-quality oil, there are very few modern oil palm mills in Nigeria. Many of them are obsolete, inefficient, and in oil palm plantations, and thus out of reach of the majority of palm farmers. This is one reason for the need to improve the traditional methods of processing oil palm fruits.

Traditional production

The traditional methods of palm oil production, especially in the oil palm belts of Eastern Nigeria, differ only at the extraction level. The previous stages in the process, from sterilization to digestion, is almost the same, invariably involving the fermentation of the fruits before processing. The different methods of extraction are as follows:

- hand pressing;
- rinsing the digested mash in water, allowing the oil to float to the surface;
- using the screw press.

In a 1992 study carried out by Chukwu in the seven states which lie in the oil palm belts of Eastern Nigeria, it was found that while the majority of the farmers ferment their fruits for 4 to 5 days before processing (see the appendix, page 9), others allow

fermentation to continue for 7 days or even longer. However, many of the palm farmers are not aware of the effect of over-fermentation on the oil they produce.

The number of days the fruits are fermented has an effect on the quantity and quality of the oil produced. Experimental results show that on average oil palm fruits contain 18% palm oil, about 90% of which can be extracted mechanically. In Nigeria, however, only about 40% of the available oil is extracted using traditional methods (Usoro 1974). Irvine (1979)

Extraction of oil by rinsing of the mash in water and collecting the floating oil.
Photo: Dr I.V.O. Modo



¹ A previous issue of the Monitor (March 1999) featured two articles on oil palm management in neighbouring Bénin, including a photo essay on the traditional transformation process of palm oil. See IK&DM 7(1), pages 12-18.

Sterilization or boiling of the palm fruits.
Photo: E.U.U. Ituen



found that using traditional methods just under half of the available oil is extracted. If the screw press (an improved traditional method) is used, slightly more than half can be extracted. By contrast, in a palm mill equipped with a sterilizer and hydraulic presses, the efficiency of extraction is often as high as 75-85%. The Nigerian Institute For Oil Palm Research (NIFOR) has estimated that the annual losses due to the low efficiency of the traditional methods amount to some 250,000 tonnes of palm oil (NIFOR 1987).

It is more difficult to arrive at exact figures with respect to the quality of the product, as there are no internationally accepted quality standards for palm oil. However, one way to assess quality is to measure the amount of free fatty acids (FFA). For example, palm oil is traditionally bought on the basis of an FFA content of 5% by importing countries, with financial penalties for exceeding this percentage. The FFA content of mature fruits, intact in the bunch, is on the order of 0.1% (NIFOR 1989). The oil from fresh ripe fruits contains very little more than this 0.1%, but when bruised and crushed fruits are used, the FFA content increases rapidly (Loncin 1952). The NIFOR (1989) noted that palm fruits are particularly susceptible to deterioration and that the lipolytic enzymes are so active that even under the most favourable conditions, palm oil seldom has a free fatty acid content under 2-3%. Under crude conditions of processing, the FFA content may be 20%, 40%, 60% or even higher.

It is commonly accepted that a great deal of oil produced by traditional methods is of poor quality, due to the high level of free fatty acids (FFA) and the high moisture content (mc). This is largely the result of over-fermentation and bruising sustained during handling. The NIFOR (1986) found that the quality of the oil produced depends to a large extent on the correct timing of harvesting. The best time to harvest the fruits is when they start to loosen and can be dislodged; this is often indicated by the presence of 2-3 loose fruits on the ground at the base of the oil palm tree. If harvested earlier, the fruits will not be ripe and will not have reached their full oil content, resulting in oil of poor quality. If harvested too late, the FFA content of the oil will increase, which likewise causes the quality of the oil to decline. In addition, there is a danger of bunch rot, which also results in a

deterioration of the oil. This has been confirmed by Heartley (1988), who observed that postponing harvesting until after the natural loosening of the fruits from the bunch causes the FFA to increase, with the resulting decline in quality. Thus it is clear that the precise moment of harvesting is crucial. A high moisture content combined with high temperatures during digestion also increases the rate of free fatty acid formation (Jacobsberg 1971).

Given the need to improve traditional methods, a study was carried out with the following objectives:

- To compare three traditional methods of palm oil extraction;
- To determine the effect of the fermentation period of oil palm fruits on the quantity and quality of the palm oil produced;
- To determine which of the methods is most efficient.

Research method

Each of the three traditional ways of palm oil extraction was examined. For each method, some 23 large, fresh bunches of fruit were collected, which had just been harvested from a plantation of the NIFOR where improved types of *Tenera* are grown.² The choice fell on *Tenera* because it is fast replacing the wild *Dura* type, thanks to its high yields. The bunches were separated into spikelets for faster fermentation. The fruits were then divided into nine piles of 50 kg each. The central stalks, which were removed when the bunches were separated into spikelets, were weighed and divided into nine portions with an average weight of 19.5 kg. This meant that each pile contained 69.5 kg of fresh raw material. Each pile was covered with plantain or banana leaves and stored in an open shed, to protect it from the rain. The covering of leaves served to increase the temperature, thus accelerating the rate of fermentation. The piles were numbered 0-8, and each day one pile was processed, starting with the pile numbered '0' on the day of harvesting and ending with the pile numbered '8' on the 8th day of fermentation.

The three stages of processing

Sterilization, stripping and digestion

On the day of harvesting, the fruits had not yet begun to loosen out of the spikelets. They were boiled or sterilized in a 120-litre drum for 2,5 hours over a wood fire (*see photo*). The fruits were stripped and re-sterilized for an additional 1,5 hours, to raise the temperature before pounding (i.e., digestion). After pounding, the hot mash was removed for oil extraction. On the next day, the first day of fermentation, the second pile (number 1) was processed. Since the fruits did not loosen out well, the same procedure was employed as on the day of harvesting. The fruits started loosening out on the 3rd day (2nd day of fermentation); they were stripped before boiling. Moulds started to develop on the spikelets on the 5th day of fermentation and by the 6th day they were seen on the outer skin of the fruits as they were stripped.

Oil extraction

Method 1. Hand pressing After the nuts were removed, the digested mash was squeezed between palms and fingers, and the oil collected and weighed on a scale sensitive to within 0.01 grams.

² There are three main types of oil palm, the *Dura*, the *Tenera* and the *Pisifera*, classified according to the thickness of the nut shell (endocarp). *Dura* has a shell thickness of 2-8 mm, *Tenera* 0.5-3 mm and *Pisifera* has no shell. *Tenera*, a cross between *Dura* and *Pisifera*, is the highest-yielding variety.



Pounding of the oil palm fruits.
Photo: E.U.U. Ituen

Method 2. Rinsing out the digested mash in water
The digested mash was mixed with a large volume of water and the fibre washed out in such a way that the oil floated to the surface. It was then skimmed, collected and weighed.

Method 3. Screw press method Nuts were removed from the hot mash after digestion, after which it was re-sterilized for one hour and fed into the screw press. The oil was collected and weighed.

Extraction of palm oil from the pounded mash with a screw press.

Photo: Dr I.V.O. Modo



Separation of the kernel nuts from the pounded mash.
Photo: E.U.U. Ituen



Appendix. Survey of fermentation period adopted in traditional method of oil palm processing in seven states of Eastern Nigeria

Days of fermentation	Number of respondents from states				Total
	Anambra & Enugu States	Abia & Imo States	Akwa Ibom State	River & Cross River States	
2-3	7	4	3	12	26
4-5	22	23	33	18	96
6-7	16	13	14	-	43
8 or more	5	10	-	20	35
Total	50	50	50	50	200

Source: I.D. Chikwu, The oil palm tree and the process of its oil. B.Sc thesis University of the Cross River States 1992 (unpublished)

Table 1. Palm oil extraction by hand pressing

Fermentation period (days)	Wt. of crude oil (kg)	Wt. of clarified oil (kg)	Free fatty acid (%)	Moisture content (%)
0	6.10	4.10	0.38	0.20
1	6.30	4.30	0.29	0.16
2	7.10	4.50	0.28	0.15
3	8.20	7.00	0.35	0.19
4	8.00	6.00	0.45	0.23
5	9.00	5.80	1.05	0.54
6	9.80	5.10	1.34	0.72
7	7.10	4.30	1.34	0.73
8	6.00	4.40	1.44	0.76

Free fatty acid determination

Free fatty acid (FFA) was estimated by titrimetry method according to the Association of Official Analytical Chemists (AOAC 1975).

Moisture content determination

A 5g sample of the clarified oil was heated in an air oven in a moisture can at a temperature of 105°C for about 12 hours until a constant weight was obtained. The loss in weight after drying represented moisture loss. Moisture content was calculated by the equation:

$$Mc \text{ (wet basis)} = \frac{\text{Moisture loss}}{\text{Initial weight of sample}} \times 100\%$$

Table 2. Palm oil extraction by rinsing out digested mash in water

Fermentation period (days)	Wt. of crude oil (kg)	Wt. of clarified oil (kg)	Free fatty acid (%)	Moisture content (%)
0	10.80	8.90	1.80	0.54
1	12.90	10.60	2.20	0.58
2	12.60	10.45	2.70	0.76
3	13.56	11.30	5.40	0.94
4	13.30	10.00	7.30	0.91
5	12.57	10.25	7.50	0.97
6	12.65	9.40	10.30	1.02
7	11.53	8.00	11.20	0.94
8	11.12	7.72	12.30	1.23

Table 3. Palm oil extraction by screw press method

Fermentation period (days)	Wt. of crude oil (kg)	Wt. of clarified oil (kg)	Free fatty acid (%)	Moisture content (%)
0	8.15	7.00	0.37	0.21
1	8.20	7.10	0.73	0.49
2	8.30	6.80	0.27	0.16
3	9.10	8.00	1.18	0.60
4	5.50	4.60	0.70	0.43
5	5.20	4.50	0.86	0.51
6	6.40	5.00	1.26	0.68
7	7.20	6.00	1.23	0.68
8	8.00	5.10	2.66	0.34

Clarification of oil

After extraction, the palm oil is referred to as crude, because it contains a certain amount of water and impurities such as sludge. In order to purify it, the crude oil was brought to a boil in a 30-litre aluminium pot. After boiling for some time, a drop of water was introduced into the boiling oil. If a loud cracking noise was heard, the oil was free from water and boiling was stopped. The oil was allowed to cool and then decanted, leaving sludge and other impurities in the bottom of the pot. This 'clarified' oil was then weighed.

Discussion

Quantity of oil produced

Tables 1, 2 and 3 show the quantity of palm oil in kg which was extracted by hand pressing, rinsing the pulp in water, and using the screw press method. The quantity of oil extracted by hand pressing is poor on the day of harvesting and the first two days of fermentation. Comparing these values with those of the rinsing and screw press methods, the quantities were low.

The amount of oil extracted by the three methods increased between the day of harvesting (zero day of fermentation) and the third day of fermentation, when peak values were recorded. From the fourth to the eighth day quantities continued to decline (see Figure 1).

The reason that the highest amount of oil was obtained on the third day of fermentation was also investigated. This apparently had to do with the fact that the fruits were thoroughly digested, i.e., pounded, so that the mash bore no traces of the outer skin. The nuts were very clean, and no mesocarp adhered to them. It was only on this third day of fermentation that the amount of oil extracted by hand pressing approached that obtained using the screw or mechanical press. Rinsing in water contributes to the efficiency of oil extraction on the third day of fermentation. Table 4 shows the percentage of oil recovered by the three methods of extraction: hand pressing, rinsing the pulp in water, and using the screw press method. In the case of all three methods, the highest oil recovery rate occurred on the third day of fermentation.

Quantity of oil

Two factors were used in determining the quality of oil extracted: the free fatty acid content and the moisture content of the palm oil. Tables 1, 2 and 3 show the free fatty acid (FFA) values and moisture content for all samples produced using the three means of oil extraction.

The FFA content was low, at any rate for hand pressing and screw press, because whole fresh bunches were used, with negligible bruising. The range of values, especially up to the 3rd day of fermentation agrees with the NIFOR figures (1989), which stated that for mature fruits, intact in bunches, the FFA is on the order of 0.1%. There the quality of oil produced, especially by means of hand pressing and the screw press, met the recommended world market limit of less than 5%. This was due largely to the type of bunches used. When the mash was rinsed in water, the FFA rose rapidly from the third day of fermentation on. This may have been due to the water in which the oil was extracted. According to Jacobsberg, hydrolysis must have taken place (Jacobsberg 1971); he found that at high temperatures the moisture content increases with each day of fermentation.

Table 5 shows the bacteria counted in oil samples for the two methods of extraction which make use of a

press. Sanitation was a problem here, and the presence of bacteria may have negatively affected the results. For example, oil from fruits of the day of harvesting should not have any such bacteria, because they were not fermented and there were no bruises. The high bacteria count must have been due to the fact that as a rule the pounding mortars are not cleaned before use. The equipment should actually be washed beforehand with boiling water. In oil palm mills, the utensils are always sterilized with steam before the start of operations. It was noted that the research results compared unfavourably with those recorded in the literature. However, the latter may have been obtained under ideal conditions. For example, on the day of harvesting oil fruits should not display a bacteria count, since the fruits showed no bruising and were not yet fermented. In practice, however, there was a high bacteria count. This must have been due to the fact that the pounding mortars are not usually washed after they are used. The need to sterilize equipment cannot be stressed too strongly. In mills, sterilizing equipment by steam is standard procedure before any new use.

Conclusion

The proper timing of the fermentation of oil palm fruits has been shown to improve the quantity and quality of the palm oil produced by traditional methods, especially when the fruit bunches are fresh. Three days of fermentation is seen to be ideal, regardless of which traditional method is used. When 50 kg of fruits in spikelets were processed, the method which involves rinsing the mash in water resulted in the highest quantity of oil, 11.3 kg, followed by the screw press method with 8 kg and the hand press with only 7 kg. This period of fermentation (three days) is therefore recommended for farmers. However, the quality of oil produced by washing the mash in water was not as high as that produced by the other two methods. This may have been due to the high moisture content in the oil. More time and energy was also required for the clarification of the oil by water extraction, suggesting that this is not a suitable method for processing large amounts of oil palm fruits, especially in the rural areas where water may be scarce. Moreover, the hand pressing method has the lowest FFA. This might have been due to the absence of previous micro-organisms in the extraction equipment as obtained in the screw press. However, hand pressing is tedious and slow and the least efficient of the three methods. Therefore, the screw press method is recommended, provided the equipment is kept clean. It produces a sufficient quantity of good quality oil in an efficient way.

E.U.U. Ituen

Department of Agronomy
University of Uyo, Uyo
Nigeria

Dr I.V.O. Modo

Department of Sociology
University of Uyo
P.M.B. 1017
Uyo, Akwa Ibom State
Nigeria

Table 4. Percentage of oil recovered by extraction

Fermentation period (days)	Percentage of oil recovered		
	Hand pressing method	Rinsing out digested mash in water	Screw press method
0	5.90	12.81	10.07
1	6.18	15.25	10.22
2	6.48	15.04	9.78
3	10.07	16.26	11.51
4	8.63	14.39	6.62
5	8.35	14.75	6.47
6	7.34	13.53	7.19
7	6.19	11.51	8.63
8	6.33	11.11	7.34

Percentage of oil recovered

Percentage of oil recovered was calculated by the formula (NIFOR 1986):

$$\frac{\text{Amount of oil recovered (clarified) kg}}{\text{Weight of fresh fruit bunches}} \times 100\%$$

Table 5. Total bacteria count in palm oil (per ml) using two methods of palm oil extraction

Fermentation period (days)	Hand pressing method		Screw press method	
	No. bacteria (colonies per ml)	Total bacteria count (per ml)	No. of bacteria (colonies per ml)	Total bacteria count (per ml)
0	4	4 x 10 ²	2	2 x 10 ²
1	2	2 x 10 ²	1	1 x 10 ²
2	4	4 x 10 ²	5	5 x 10 ²
3	3	3 x 10 ²	1	1 x 10 ²
4	4	4 x 10 ²	7	7 x 10 ²
5	0	0 x 10 ²	9	9 x 10 ²
6	2	2 x 10 ²	2	2 x 10 ²
7	3	3 x 10 ²	2	2 x 10 ²
8	8	8 x 10 ²	7	7 x 10 ²

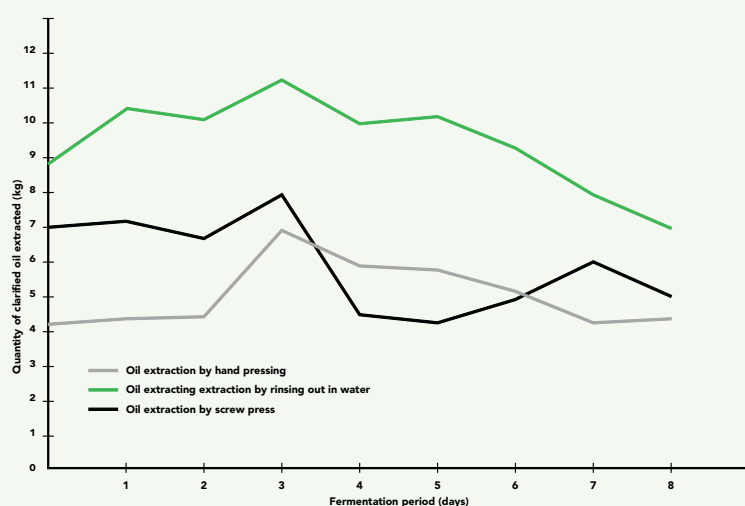


Figure 1. Fermentation period and quantity of clarified oil extracted for the three traditional methods.



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Women and dryland post-harvesting practices in Tamil Nadu, India

In India, dryland agriculture is an important source of livelihood. However, as the production is seasonal, it is of the utmost importance to store grains safely after harvesting. Research into post-harvest practices in Tamil Nadu, India, has revealed that these activities are largely the responsibility of the women. For this reason, the authors recommend that the local women be consulted when new post-harvest techniques are being devised, in order to ensure their sustainability.

In India some 123 districts have been classified as dryland areas, all of which have an annual rainfall ranging from less than 500 mm to 1500 mm. While dryland agriculture accounts for more than 70% of the cultivated area of the country, it contributes only 42% of the national food basket. The yields in dry tracts are low, and there is always the risk of a total crop failure as a result of erratic rainfall. Thus dryland agriculture is faced with the twin problems of climatic instability and low productivity (Jain 1985). One important aspect of dryland agriculture is the fact that production is seasonal, which means that grains must be stored for long periods by traders, procurement agencies and consumers.

In Tamil Nadu, dryland farming areas constitute 52% of the total cultivable area, and contribute 40% of the total food production (Jodha 1984). Here farming in dryland areas has been a way of life from time immemorial. Traditional cultivation techniques and post-harvest practices have been developed by the farmers themselves and are rooted in their own experience. In Tamil Nadu, as in rural areas worldwide, women are typically responsible for farming. National surveys have shown that the contribution of women to agriculture is higher than that of men. This includes most of the key operations, such as the application of manure and fertilizers, weeding, protecting crops from birds, threshing, winnowing and storing produce. In Tamil Nadu, the female population is just over 16 million. Some 48% of the rural labour force consists of women, while 22% of the cultivators are female. As a result, most of the post-harvest operations are carried out by farm women.

Post-harvest operations

While post-harvest practices vary according to the specific crop, in general they include all the operations which take place after harvesting and which are required to make an agricultural product suitable for immediate consumption and/or storage. These commonly include threshing, winnowing, cleaning, and drying. In dryland agriculture, an important aspect of post-harvest operations is the need to ensure that the produce is kept free from rot, pests, and rodents. Given the low productivity of the system as a whole, it is important to see that the produce which is ultimately obtained is edible and palatable.

Numerous 'post-harvest technologies', including improved material and better equipment,



have been introduced to make the process faster, easier and more profitable. However, the majority of the farm women continue to use traditional tools and techniques for many post-harvest operations. Such indigenous knowledge is highly valued, since in many cases the new tools and techniques are not available or are beyond the means of the farmers.

1. Threshing by using a wooden stick.

Photo: S. Parvathi

Research

A study was carried out in 1994-95 in Kattankudi, Puliampatti and Chettipatti villages of Aruppukottai block in Kamarajar District of Tamil Nadu, India (see map, page 16). The majority of the farmers in these villages belong to medium and low socioeconomic status groups. In the study area most post-harvest operations were performed by the women rather than men. The objective of this study was to identify the indigenous tools and practices that are being used by farm women for various post-harvest operations in the case of millets, pulses and oil seed crops. It was felt that this would make it easier to establish which of the innovative post harvest technologies would be most compatible with the traditional practices presently in use.

Table. Post-harvest operations in dryland crops

Indigenous practices/tools	Description	Crops
Threshing By using wooden sticks	Farm women use wooden sticks approximately 0.5m in length to thresh the grains (small quantities). They hold the wooden sticks in their hands and beat the harvested crops to separate the grains from the earheads. This is usually done on an earthen floor.	Millet, pulses, and oilseeds (except groundnut)
Spreading the earheads on roads	The earheads are spread on the road where vehicles run over them and the grains become separated.	
Using bullocks and rollers	Harvested crops are spread out in the threshing yard. Bullocks pulling a heavy stone roller are allowed to trample the harvested produce. The stone roller runs over the earheads and the grains become separated. This practice is used for large quantities of produce, especially if the road is too far away.	
Using tractors	The harvested crops are spread on the threshing yard and the tractor is allowed to run over them, thus separating the grains. A tool known as a <i>kavathukkavai</i> (V-shaped wooden utensil with a long handle) is used to lift the earheads from the bottom to the top for uniform threshing. A <i>pallukkavai</i> is a tool made of wood or iron, which is used to remove the plants of black gram and earheads of cumbu. A <i>kootupalagai</i> is another tool made of wood and it looks like a levelling board fitted with a long handle. It is used to heap the threshed produce together (see photo 2, p. 15).	Black gram and bajra
Beating crops on wooden platforms, etc.	The harvested crops are beaten against the wooden platform, benches and stools to separate the grains.	Red gram
Winnowing By using winnower (<i>solavu</i>)	The grains are winnowed in a device called a <i>solavu</i> and the grains are dropped from a height. This separates the dust from the grains. To increase the height they stand on a cart or use a step-like structure called a <i>kokkali</i> . Three different types of <i>solavu</i> are used. One is made out of sheaths of the <i>Morinda tintoria</i> , a member of the mulberry family known locally as <i>manjanathi</i> ; the two other types are made of bamboo and palmyrah leaves.	Black gram and millets
By using broomsticks (<i>vallippumar</i>)	Piles of grains are winnowed with the aid of a <i>vallippumar</i> , a kind of broomstick made up of coconut leaves. Other types, made of plants like cotton stalk, redgram stems and <i>manjanathi</i> , are also used to heap the threshed produce.	Millet and pulses
Cleaning Using sieves (<i>salladai</i>)	<i>Salladai</i> (sieves) are used to remove dust, immature seeds, stones, etc. from the threshed grains. In the case of small quantities, a smaller sieve made of steel is used to remove stones and leaves. For larger quantities, a big sieve made of wire mesh with a wooden frame is used.	Black gram and green gram
	After threshing, the sunflower seeds are separated by means of a sieve-like utensil made of with palmyrah leaf sheaths.	Sunflower
Drying	Sun drying is done to dry the grains. This is usually done on a 'new moon' day, since this is thought to reduce the risk of damage by pests.	Millet, pulses and oilseeds
Storage Gunny bag	The cleaned produce is stored in gunny bags, fertilizer bags, drums and pots, <i>pattarai</i> and <i>kulumai</i> or <i>kudhir</i> (made of cowdung and clay).	
Pest control methods Mixing non-toxic materials with produce	To protect the stored grain from pests, any one of the following materials are mixed with the stored produce: ash, soap nut powder, nochi, leaves, pungam leaves, neem leaves.	Pulses and millets
	Spreading BHC 10% on the gunny sacs or placing a cloth bag of BHC 10% inside the sacs.	Black gram, gingelly and millets (for seed purposes only)
	Mixing red earth with red gram	Red gram
	Mixing pieces of jaggery, husk of gingelly and cumbu, and sand.	Pulses and gingelly
	Sorghum, sunflower and cumbu are preserved by hanging the earheads in the kitchen.	Sorghum, sunflower and cumbu (for seed purposes)
Preservation of processed products		
Mixing jaggery	Storing pieces of jaggery in oil, and placing them in mud pots or tins.	Sunflower/gingelly oil
Mixing vegetable oils	To dehusk the black gram and green gram, any vegetable oil (usually groundnut oil) is mixed in and the husk removed, using a stone mortar and huller.	Black gram and green gram

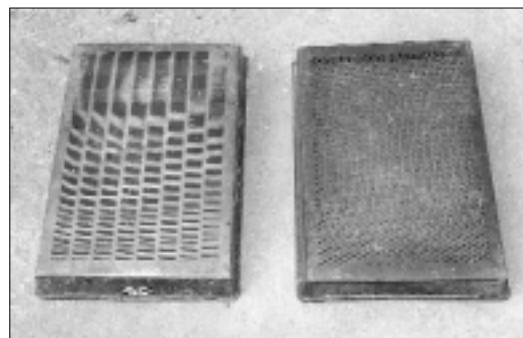


2. Woman using a koottupalagai to heap the threshed produce together. Photo: S. Parvathi

Findings

The 19 indigenous post-harvest practices identified were used by all the dry land farmers in the villages, irrespective of caste and class. According to the farm women, these practices were handed down from generation to generation, usually by word of mouth. They were perceived to be economically feasible and user-friendly. The indigenous post-harvest tools which the women used were made by local artisans, using low-cost resources which were locally available, and they were easy to repair and to maintain. Moreover, indigenous post-harvest procedures do not require a high degree of technical skill. In view of these advantages, the post-harvest operations identified here provide a point of departure for designing appropriate new technology for sustainable agriculture.

All 19 technologies were developed by the farming community and evolved gradually over the years, through informal, trial-and-error processes. This clearly demonstrates that the 'local people' are the 'innovators', and that when new post-harvest technologies are devised, they should be consulted first, because they are the real 'experts', as well as the ultimate users.



4. Salladai, sieves, used to clean the threshed grains of black gram and/or millets. Photo: S. Parvathi



3. Winnowing the grains (of black gram and/or millets) by taking them in a solavu, winnower, and drop the grains from a step-like structure called kokkali thus separating dust from the grains. Photo: S. Parvathi

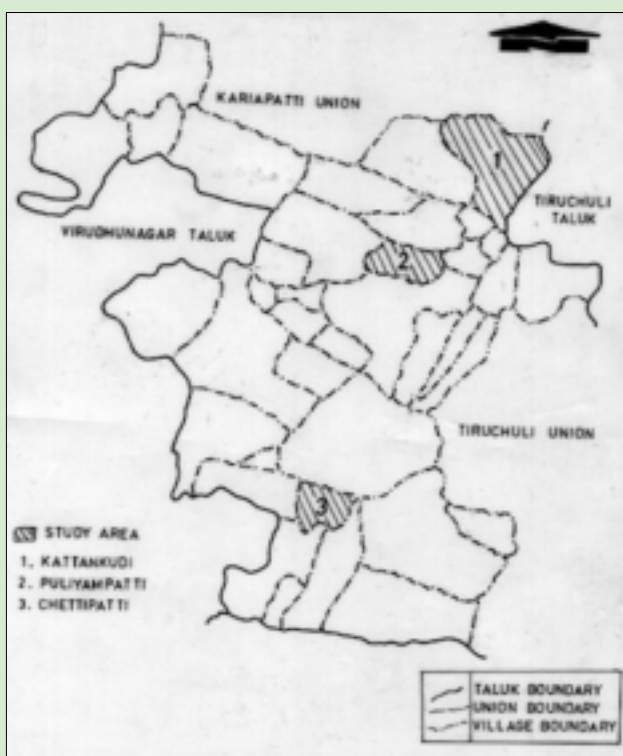


Map showing Tamil Nadu, India.



Map showing the districts of Tamil Nadu.

Map showing the villages selected for the study.



Conclusion

Indigenous post-harvest technologies have been widely adopted by rural people in dryland areas. In this study, some 19 indigenous post-harvest operations adopted by the farmers for dryland crops were identified and documented. Appropriate new post-harvest techniques for dryland crops can be developed by integrating these indigenous knowledge systems into the research and development projects. Furthermore, these systems should be refined and field-tested, with a view to wider adoption. This will encourage the dryland farmers to adopt the improved post-harvest technologies.

Dr S. Parvathi

Associate Professor
Department of Home Science, Agricultural College and Research Institute
Madurai 625 104
India
Tel.: +91-452-822 956
Fax: +91-452-822 785
E-mail: macdean@vsnl.com

Dr K. Chandrakandan

Director of Extension Education
Tamil Nadu Agricultural University
Coimbatore 641 003
India
Tel.: +91-422-431 222
Fax: +91-422-431 672
E-mail : vctnau@tnau.kovai.tn.nic.in

Dr C. Karthikeyan

Assistant Professor (Extension)
Department of Agricultural Extension and Rural Sociology
Tamil Nadu Agricultural University
Coimbatore 641 003
India
Tel.: +91-422-435 103 (R)
Fax: +91-422-431 672
E-mail : vijikarthi18@yahoo.com

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Traders, farmers and mango development projects in Kerala, India

I have noticed that those involved in development projects involving commercial farming are beginning to realize that the knowledge of farmers is of considerable value. However, the knowledge of traders is still largely neglected. Apparently the notion of the 'exploitative trader' continues to prevail, so that they are largely bypassed by development programmes. And yet traders often act as a link between local farmers and outside organizations, while they have considerable useful information on marketing and prices, as well as on new technologies, both those developed in research stations or private nurseries, and trials conducted by farmers. I have taken a closer look at mango cultivation in two villages in Kerala, India, and I would like to share my experiences there.

This piece is based on qualitative information which I gathered in 1995 by means of rapid rural appraisals and semi-structured interviews with farmers, mango traders, and bank and government officers in the villages (*panchayats*) of Kollangode and Muthalamada, Palghat District, India.

These two villages are among the major mango-growing areas of Kerala. Due to special climatic conditions, they enjoy an early harvest season in comparison with other parts of India. Mango from Kerala can be sold in terminal markets in North India well before mid-April, the start of the harvesting season in the north.

Groundnut and cotton—the cultivation of which is becoming less and less profitable—are gradually being replaced by young mango trees, especially in the higher areas. This shift has had a positive environmental effect: The tree cover has increased and less water and chemical fertilizers are being used. Experienced farmers, traders, and managers of local private nurseries say that the micro-climatic and edaphic conditions prevalent in the higher-lying areas of Kollangode and Muthalamada are ideally suited to the cultivation of mango.

Traders and farmers

Regional and inter-state mango trading from Palghat District started about 20 years ago. Today several wholesalers have established contacts with large commission agents in terminal markets in North India. In addition, some 100 small country buyers and commission agents are involved in mango marketing in Kollangode and Muthalamada. But the role of mango traders is not restricted to marketing. They also supply seedlings, recommend cultivation techniques, and lease most of the mango trees in the region from local farmers. The main motive of traders for leasing mango trees is to ensure that they will have enough fruit to sell and can compete with other local traders. During the flowering season in December, traders inspect the trees with the farmers, and then settle on a price for a number of trees or even whole plots. The full lease is paid in advance to the tree owner. From then until the start of the monsoon season—i.e., from December to late May—the trader is fully responsible for the cultivation of the trees: weeding, spraying with pesticides, applying fertilizers, and ultimately harvesting.

Most farmers in this region prefer to lease their mango trees rather than to cultivate and harvest them on their own. They have a guaranteed income and all risks are borne by the trader; moreover, their cultivation costs are lower and they have fewer labour

problems. In effect, the role of farmers is limited to decision-making—whether to plant mango trees at all—and caring for the young trees during the first three to five years. After that, farmers become mere 'tree owners'.

Given this scenario, it will be clear that traders are more experienced than farmers. Over the years they have gathered considerable knowledge regarding both cultivation practices and the mango varieties best suited to local conditions. Through business contacts the experienced wholesalers are also well-informed about mango cultivation techniques developed elsewhere. Traders know about both the most marketable and the most ecologically suitable mango varieties. They usually recommend planting early-yielding varieties that fetch comparatively high prices. They advise farmers to grow four or five different varieties, in order to reduce the risks represented by weather conditions, pests and disease, and to lower dependence on individual terminal markets, which often have particular preferences regarding fruit varieties. Farmers who do not lease their trees often rely on the seedlings provided by the governmental projects. However, those projects distribute only two varieties, neither of which is popular in the market.

Mango development projects

At the time of the research (1994-1995), there were three governmental development projects related to mango in progress in the area: the *Centrally sponsored scheme on the integrated development of tropical and arid zones*; the *Centrally sponsored scheme for rejuvenation*, and the *Kerala horticultural development programme (KHDP)*. Under the two centrally sponsored schemes, farmers benefited from cultivation subsidies. The KHDP, which operated on a loan basis, also had training and marketing components. The latter programme, in particular, sought the active participation of the farmers, who became shareholders in a new fruit-processing factory located elsewhere in Kerala. The local farmers are well aware of the influence and knowledge of the traders, and in general they take advantage of the various services which traders offer. However, the development projects focusing on mango cultivation have thus far failed to include the traders. Farmers in Kollangode and Muthalamada hinted at certain shortcomings in the projects. They complained about the selection process for subsidies and loans, and about the low quality of the mango seedlings provided. It would appear that they do not yet have as much confidence in the marketing system of the KHDP as in the well-established private marketing network which operates through local traders. A planned scheme

Mangifera indica,
mango





Map showing Kerala, India.



Map showing the districts of Kerala.
 'Palakkad' is the local name for Palghat district.



involving direct marketing to a fruit-processing factory owned by the KHDP would exclude the local traders, bringing to an end the popular leasing system described above.

In addition, local knowledge has not been incorporated into the mango development projects. While the three projects were oriented toward farmers and their needs, little attention was given to the knowledge of farmers, and none at all to that of the traders. Instead of integrating the traders' knowledge and services, the projects have strived to create parallel marketing structures. At best, the projects are ineffective in increasing mango production, as they fail to recognize that the traders are currently the most important producers. At worst, they disrupt existing networks and marginalize resource-poor farmers, who then tend to be neglected by official development schemes.

Recommendations

Although this case study represents one specific situation, it does show that traders can play a significant role in agricultural development, one that goes beyond marketing, and actually includes the extension and promotion of agricultural technologies. Given the important position of traders, the mango development projects should seek their co-operation in sourcing and providing seedlings, inter-state marketing, and advocating environmentally sound cultivation practices. Under a mutual arrangement, the projects could concentrate on the provision of cultivation subsidies and loans. Since the objective of the projects, i.e., to increase mango production, is compatible with the traders' interests, such collaboration would appear to be feasible. When the traders realize that this co-operation has the potential to increase production, leading to higher returns for themselves, they will be ready to give others access to their knowledge. However, coordination and monitoring must remain with the projects, in order to prevent exploitative relations between traders and mango growers.

At present, traders and other actors directly or indirectly involved in cultivation, play no role at all in development projects. A more thorough analysis of the locality-specific situations, together with a better understanding of the role played by various actors (including traders), will no doubt ensure that the laudable farmer orientation in agricultural projects does not lead to a 'farmer bias'. Through an active co-operation with traders, development-project activities can take advantage of existing structures and knowledge. Through co-operation rather than competition, traders can be motivated to consider aspects that go beyond mere economic self-interest. At the same time agricultural projects can encourage traders to embrace eco-friendly technologies and hence to contribute to sustainable agricultural development.

René Veron
 C-139 Defense Colony
 New Delhi 110 024
 India
 Tel.: +91-11-462 2948
 Mobile tel.: +91-98100 28893
 E-mail: reneveron@mantraonline.com

Review: Modelling and indigenous knowledge

Reality in its full complexity can never be fully understood. All of us create our own images or models of reality. Holders of indigenous knowledge (IK) make their own models in their minds. And when research scientists conduct studies or experiments, they formulate hypotheses and construct formal models (thought models, flow diagrams, mathematical models of various kinds, etc.). I was asked to review recent publications on modelling of 1) the dynamics of agricultural development and 2) vegetation dynamics in semi-arid grazing systems. I found both books to be quite interesting but could see little relationship with IK. After discussion with the journal editor, we agreed that I would review the books only briefly and would add some general comments on the usefulness of scientific modelling for farmers and development workers.

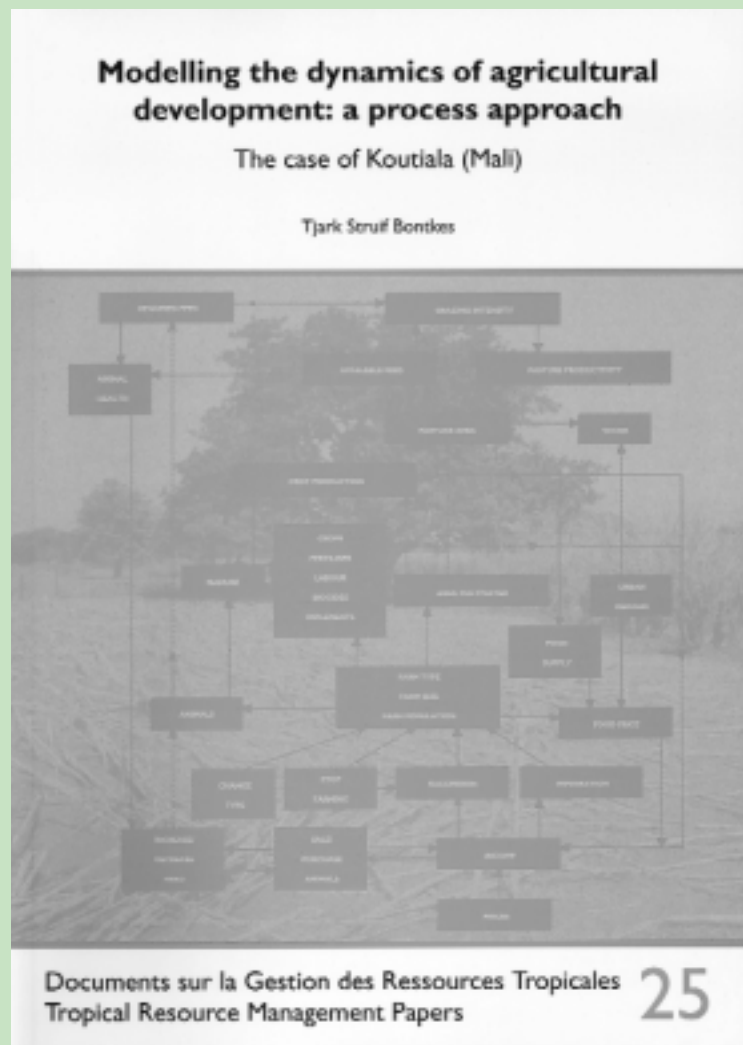
Bontkes, Tjark Struif (1998) **Modelling the dynamics of agricultural development: a process approach - The case of Koutiala (Mali)**. Tropical Resource Management Papers 25. 233 pp. ISSN 0926-9495. NLG 40. Wageningen University and Research Centre Liaison Office, P.O. Box 9101, 6700 HB Wageningen, the Netherlands. Tel.: +31-317-484293. Fax: +31-317-484292.

In its own words, this study 'explores the suitability of dynamic simulation modelling as a tool to help decision makers ...' For a cotton-growing area in southern Mali, the author presents two models—one for the farm level and the other for the regional level—which try to integrate biophysical with socio-economic components, in this case crop and animal production with labour and farm economics. Farms are classified according to wealth, family size, crops, farm equipment, soil quality, etc.

The models reveal the limitations of holistic approaches. They are too complex for most people to understand quickly, but are still very simplified views of reality. As examples of the non-captured complexity: the models include only cattle as livestock, but the farm families also keep goats, sheep or chickens; no differentiation is made in division of labour according to gender; and a leguminous crop, dolichos, is viewed only as forage although it produces edible beans.

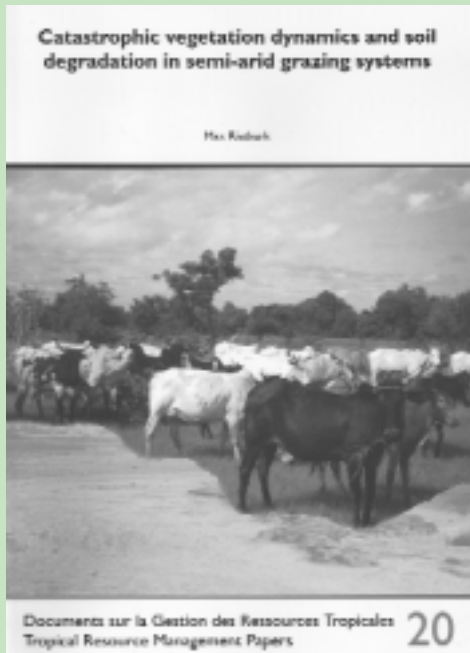
The recent shift to cotton production in Mali has increased the wealth of many farmers, but the models show that unless land-use practices change, the yields of both cash and food crops will eventually decline. An important conclusion from the model for the region is that it cannot support a growing human population and provide for higher incomes at the same time.

The models are then used to explore some alternatives, such as keeping livestock in stalls. The choice of scenarios tested (e.g. lower fertilizer price and higher cotton price) is somewhat optimistic. What would happen if the cotton price falls and the fertilizer price rises? For an understanding of the possible impacts of change, it would have been more helpful to investigate farmers' current practices more deeply and, as far as the farm model is concerned, to concentrate on fewer but key components, to do this in more detail, and not to attempt to explain an entire production system in equations.



Rietkerk, Max (1998) **Catastrophic vegetation dynamics and soil degradation in semi-arid grazing systems**. Tropical Resource Management Papers 20. 155 pp. NLG 40. Wageningen University and Research Centre Liaison Office, P.O. Box 9101, 6700 HB Wageningen, the Netherlands. Tel.: +31-317-484293. Fax: +31-317-484292.

This doctoral thesis is a collection of papers dealing with vegetation dynamics and soil degradation in semi-arid parts of Africa. The catastrophe theory



assumes that certain events, such as droughts, can push the vegetation beyond a threshold from which it is difficult or impossible to recover. The proof for this is based on some observations and much theoretical reasoning and model calculations.

Already in the introduction, the author states that he does not agree with a recent theory that vegetation dynamics in drylands are determined mainly by rainfall and its variability, rather than by grazing pressure. This refers to the 'non-equilibrium theory' that variability in annual rainfall leads to great variability in annual vegetation yields and composition, and that managing pasture by adjusting stocking rates therefore cannot, on its own, achieve equilibrium in vegetation. The examples chosen to disprove the non-equilibrium theory are derived from the more humid areas of the 'drylands' (seasonally dry tropics, with annual rainfall of 600-800 mm). But proponents of the non-equilibrium theory say that where annual rainfall varies by more than 33 per cent, vegetation will seldom reach equilibrium. This is found in areas of West Africa with mean annual rainfall of 400 mm or less. The author's own observations show that outside cropping zones, vegetation recovers quickly after rain, especially if most of the plants are annuals and soils are light and sandy. A catastrophic collapse of vegetation is more likely if perennial herbaceous or woody plants predominate.

The author of the thesis does not show any link between his ecological theories and indigenous knowledge and practices. Nevertheless, for readers interested in ecological theory, the thesis provides stimulating reading.

General comments: how can scientific modelling be relevant to IK?

At the International Rangeland Congress (IRC) held in July 1999 in Townsville, Australia, a special session was devoted to the modelling of rangeland systems. Although many Australian ranchers have college educations and are computer-literate, they complain that scientific models are too complicated to be useful. Even the widely known decision-support models are rarely used in practice. The data required are not easily available, and only a specialist can really understand the models. One conclusion reached at the IRC was that two broad types of models should be differentiated:

- scientific models, which tend to be complex, usually require knowledge of higher mathematics, and are intended to help provide new insights into the objects studied or to identify information gaps. These models deal with parts of an agricultural system or try to integrate the different components of such systems.
- simple decision-support models, which may entail spreadsheet computer calculations.

If we add graphic and thought models (e.g. flow diagrams and various kinds of maps and calendars), the link between models and indigenous knowledge can be more clearly seen. Graphic and thought models can pinpoint essential strengths and weaknesses in an existing system. Identifying patterns of activities (calendars) and movements of resources as inputs and outputs (e.g. bio-resource flow diagrams) can help both land users and participating scientists to gain a better understanding of a local farming system and environment.

Scientific (mathematical, computer-based) models can help verify indigenous knowledge or show its limitations. This is particularly true where scientific parameters are closely correlated with indigenous concepts, e.g. of soil fertility. Where the

parameters in the model require extensive laboratory measurements (e.g. of micro-nutrients), model calculations can help identify trends that are important for the sustainability of local practices in the long run but may be less obvious to farmers in the short run. For example, farmers may know that their traditional practice of burning vegetation before planting makes plants grow better in the wet season (burning increases the short-term availability of nutrients to the crops) but may not know that burning could lead to an overall decrease in nutrients in the soil over several years or decades. This could be revealed by a computer model based on soil analyses.

There is no intrinsic contradiction between the use of complex models and indigenous knowledge; in many instances, these can be complementary. Both of the above-mentioned books dealt with scientific, largely mathematical models which would be beyond the understanding of anyone not specialized in this type of modelling. If such scientific models are to be useful for farmers in southern Mali or in the African drylands, they must be constructed not in isolation but rather in close cooperation with the land users. Mathematics can be useful if it can be made clear to the farmers and development workers what the outcomes mean. Unfortunately, in neither of the two books were serious attempts made to bridge the gap between indigenous knowledge and formal science.

Wolfgang Bayer (Dr Agr.)

Consultant in pasture and forage management and extensive animal husbandry, and part-time lecturer in tropical forage management at the University of Göttingen
 Rohnsweg 56, D-37085 Göttingen, Germany
 Tel.: +49-551-485 751
 E-mail: wb.waters@link-goe.de

IK Resource Centres

AFRICA

Burkina Faso

BURCIK

Burkina Faso Resource Centre for Indigenous Knowledge
(Centre Burkinabè de Recherche sur les Pratiques et Savoirs Paysans)
Dr Basga E. Dialla, Director (Correspondent)
INNS, B.P. 5154, Ouagadougou 02
Burkina Faso
Tel.: +226-360 746.
Fax: +226-315 003.
E-mail: emile_dialla@yahoo.fr

On 29 June 1999, BURCIK signed a cooperation agreement with the Africa Region Knowledge and Learning Center at the World Bank in Washington, D.C. (USA). BURCIK was asked to report 15 case studies related to indigenous knowledge in various domains. These were to be included in the IK database at the World Bank (<http://www.worldbank.org/afr/ik/datab.htm>) There was a tight deadline but BURCIK succeeded in reporting 17 cases. With the USD 3000 it received for the job, BURCIK purchased a computer, which will enable it from now on to interact more easily with other IK resource centres. With pleasure, BURCIK announces its e-mail address: emile_dialla@yahoo.fr.

For the year 2000, BURCIK has received funds from the local institute for social sciences INSS in order to conduct research on how local farmers classify soils and manage natural resources.

Cameroon

CIKO

Cameroon Indigenous Knowledge Organisation
Prof. C.N. Ngwasiri, Director (Correspondent)
P.O. Box 8437, Yaoundé, Cameroon
Tel. / fax: +237-318 076.
E-mail: ngwasiri@camnet.cm

Ethiopia

INRESC

Indigenous Resource Study Centre
Dr Tesema Ta'a, Director (Correspondent)
College of Social Sciences
Addis Ababa University
P.O. Box 1176, Addis Ababa, Ethiopia
Tel. / Fax: +251-1-550 655.

Ghana

CECIK

Centre for Cosmovisions and Indigenous Knowledge

Dr David Millar, Director (Correspondent)
P.O. Box 607
Bolga - U.E./R , Ghana
Tel. / fax: +233-72-235 00.
E-mail: cecik@africaonline.com.gh
(attention Dr David Millar)

GHARCIK

Ghana Resource Centre for Indigenous Knowledge
Dr M. Bonsu, Interim Director (Correspondent)
School of Agriculture
University of Cape Coast, Cape Coast
Ghana
Tel.: +233-42-2240-9/2480-9.
Telex: 233-42-2552 UCC GH

Kenya

KENRIK

Kenya Resource Centre for Indigenous Knowledge
Dr Rashid Aman, Correspondent
The National Museums of Kenya
P.O. Box 40658, Nairobi
Kenya
Tel.: +254-2-742 131.
Fax: +254-2-741 424.
E-mail: raman@AfricaOnline.co.ke

Patrick M. Maundu of KENRIK reports that they are at the moment reorganizing the centre. He hopes that more news can be communicated in the next issue of the Monitor.

For the last eight years, KENRIK has been conducting research on the traditional food plants of Kenya. One outcome of this work is a database containing entries for more than 800 indigenous plant species that are used in one way or another for food: fruits, leafy vegetables, spices, teas, gums, resins, and other, more minor food products. Work on about 235 of these species has now been published in a book entitled *Traditional food plants of Kenya*. The book was launched on 15 October 1999 in the National Museums of Kenya (NMK) and is now available at KENRIK. (For the address, see above.) The particulars of the book are as follows: P.M. Maundu, G.W. Ngugi, and C.H.S. Kabuye (1999) *Traditional food plants of Kenya*. 270 pp. ISBN 9966-9861-4-6. The book contains:

- descriptions of 175 main species and some 60 minor species, with information on uses, distribution in Kenya and the rest of the world, ecology, commercial use, potential for domestication, and status of the species in the wild.
- over 500 illustrations
- 60 colour photographs
- over 4000 local plant names with their scientific equivalents
- a food-composition table
- a table of domesticated and marketed species
- a glossary of botanical terms
- a linguistic classification of Kenyan communities

- maps showing the distribution of the species within the administrative divisions, ethnic communities and agro-ecological zones of Kenya.

A review of *Traditional food plants of Kenya* will be published in a future issue of the *Indigenous Knowledge and Development Monitor*.

Madagascar

MARCIK

Madagascar Resource Centre for Indigenous Knowledge
Ms Juliette Ratsimandrava, Correspondent
c/o Centre d'Information et de Documentation Scientifique et Technique
B.P. 6224
Antananarivo 101, Madagascar
Fax: +261-2-32123/20422.

Nigeria

ARCIK

African Resource Centre for Indigenous Knowledge
Prof. D. Olu Ajakaiye, Director ARCIK (Correspondent)
Prof. S.O. Titilola, Research Coordinator
Nigerian Institute of Social and Economic Research (NISER)
PMB 5 – UI Post Office, Ibadan, Nigeria
Tel.: +234-22-400 500.
Fax: +234-22-416 129 or +234-1-614 397.
E-mail: arcik@niser.org.ng

CIKFIM

Centre for Indigenous Knowledge in Farm and Infrastructure Management
Dr G.B. Ayoola, Director (Correspondent)
Centre for Food and Agricultural Strategy
University of Agriculture
Private Mail Bag 2373, Makurdi, Nigeria
Tel.: + 234-44-533 204.
Fax: +234-44-310 20 (box 5).

CIKPREM

Centre for Indigenous Knowledge on Population Resource and Environmental Management
Prof. D.S. Obikeze (Correspondent)
Dept. of Sociology and Anthropology
University of Nigeria, Nsukka, Nigeria

NIRCIK

Nigerian Centre for Indigenous Knowledge
Dr J.O. Olukosi, Coordinator (Correspondent)
Institute for Agricultural Research
Ahmadu Bello University
PMB 1044, Zaria, Nigeria
Tel.: +234-69-50 571-4 Ext. 4322.
Fax: +234-69-50 891/50 563.

YORCIK

Yoruba Resource Centre for Indigenous Knowledge
Prof. Layi Egunjobi, Coordinator
Dr Bolanle Wahab, Correspondent
Centre for Urban and Regional Planning
University of Ibadan, Ibadan, Nigeria
E-mail: egunjobi.wahab@ibadan.skannet.com

In December 1999, YORCIK correspondent Dr Bolanle Wahab presented a paper at a national workshop organized by Afrique Environmental Development and Education (an international NGO) at the Premier Hotel, Ibadan (Nigeria). The title of his paper was 'African traditional religion and environmental health and sanitation'.

YORCIK is holding a two-day conference in August 2000 at the Conference Centre, University of Ibadan. It will cover various aspects of Yoruba indigenous knowledge: Education, health and sanitation; Settlement planning and housing; Agriculture; Arts and crafts; Commerce; Governance; Cultural heritage; Music and dancing; Dressing; and Information and communication. Participants will include academics, researchers, civil servants, artisans, indigenous people, community leaders, students, journalists, and other persons who have an interest in Yoruba indigenous knowledge systems. The conference papers will be published as a book of proceedings and circulated globally. It is hoped that the conference will be funded in part by conference participants, and in part by international NGOs and other external agencies. Assistance will be required especially for the publication of the conference proceedings. YORCIK anticipates that the conference will bring it useful publicity and thus increase its membership.

On the second day of the conference, participants will be able to visit the grave of Dr D. Michael Warren if they wish. As many Monitor readers know, Dr Warren played a key role in establishing the worldwide movement to focus attention on indigenous knowledge. He was the founder of CIKARD in Iowa (US) and of YORCIK in Nigeria. He died while visiting Nigeria two years ago and is buried in Ara Town.

Further details about the conference will be announced in the next issue of the *Indigenous Knowledge and Development Monitor*.

Sierra Leone

CIKFAB

Centre for Indigenous Knowledge Fourah Bay College
Dr Dominic T. Ashley, Director (Correspondent)
Department of Sociology, Fourah Bay College
University of Sierra Leone, Freetown
Sierra Leone
Tel.: +232-22-7387.

South Africa

SARCIK

South African Resource Centre for Indigenous Knowledge
Alwyn Dippenaar, Executive Director (Correspondent)
The Institute for Indigenous Theory and Practice

P.O. Box 2355, Somerset West
7129 South Africa
Tel.: +27-21-854 3299.
E-mail: alewijn@iafrica.com

Tanzania

MARECIK-tz

Maasai Resource Centre for Indigenous Knowledge
Dr Nathan Ole Lengisugi, Director (Correspondent)
P.O. Box 14288 Total Building, India Road, Arusha, Tanzania
Tel.: +255-570 4229/8559.
Mobile tel.: +255-0811 510 229.
Fax: +255-570 4229.
E-mail: multicho@yako.habari.co.tz

MARECIK-tz director Dr Nathan Ole-Lengisugi spent November and December of 1999 on the Usangu Plains of the Mbeya Region of Tanzania on a consulting assignment for DFID/ODA. He conducted research among the groups of pastoralists living there, which represent several ethnic groups. The research focused on how the groups use the land and catchment area.

Zimbabwe

ZIRCIK

ZIRCIK, the Zimbabwe Resource Centre for Indigenous Knowledge
78 Kaguvi Street, New Book House
P.O.B. 4209, Harare
Zimbabwe
Mr Washington Chipfunde is ZIRCIK's director and contact person. The contact address particulars are as follows:
Tel.: +263-4-781 770 / 1.
Fax: +263-4-751 202.
E-mail: bookhouse@ZBMT.icon.co.zw

ASIA

Bangladesh

BARCIK

Bangladesh Resource Centre for Indigenous Knowledge
Sukanta Sen, Director (Correspondent)
Integrated Action Research and Development - IARD
3/7 Block-D, Lalmatia, Dhaka-1207
Bangladesh
Tel.: +88 02-91-32 372.
Fax: +88-02-811-55 48.
E-mail: iard@bdonline.com

The second national workshop on indigenous knowledge was a success. BARCIK had conducted it jointly with the IK research project of Durham University, UK. The workshop was entitled *Documentation and application of indigenous knowledge* and it took place in Dhaka, Bangladesh, 16-17 January 2000. The workshop proceedings will be published at the end of March. Readers interested in obtaining a copy are advised to contact BARCIK directly at the address above.

More information about the workshop will be published in the next issue of the Monitor.

India

CARIKS

Centre for Advanced Research on Indigenous Knowledge Systems
Dr Jan Brouwer, Director
Ms S.L. Meenu, Correspondent
P.O. Box 1, Saraswathipuram
Mysore - 570 009, India
Tel.: +91-821-542 467.
Fax: +91-821-542 459.
E-mail: cariks@bgl.vsnl.net.in
<http://iias.leidenuniv.nl/host/ccrss/cariks/htm>

CIKIB

Centre for Indigenous Knowledge on Indian Bioresources
Dr S.K. Jain, Director (Correspondent)
c/o Institute of Ethnobiology
National Botanical Research Institute
P.O. Box 436, Lucknow - 226 001, India
Tel.: +91-522-224 556.
Fax: +91-522-282 849.

The *Dictionary of ethnoveterinary plants of India* (by S.K. Jain, assisted by Sumita Srivastava) has just been published. It is the first consolidated account of over 800 plants used by local people in India for purposes of animal healthcare. The book lists plants with their local names plus brief botanical descriptions and lists of the animal diseases for which the plants are used. The work is based on the study of some 200 publications. It includes illustrations of 175 plants as well as glossaries and indexes of botanical terms, diseases, families of plants, and local names. For more information, contact: Deep Publ., A-3/27A, DDA Flats, Paschim Vihar, New Delhi 110 063, India.

A glossary of common plants used for economic purposes is nearing completion. It will provide scientific names and brief descriptions of uses. The glossary will be bilingual, arranged in the order of the local Indian names and written using the Indian script *Devnagri*. The scientific names are written in both Roman and Indian script. It is hoped that this will make the publication more useful to practitioners of indigenous medicine as well as to students and researchers.

CIKIB is also preparing a bibliography on ethnobotany, which will cover publications of the last two decades. The bibliography is meant to help researchers determine the current status of research on indigenous knowledge in the various regions and among the various ethnic groups of India.

The centre is now also constructing a database of the uses of plants that are common to India and Africa.

CIKIHR

Centre for Indigenous Knowledge of Indian Herbal Resources
Dr N.C. Shah, Coordinator

Dr A.S. Bhadauria, Correspondent
MS-78, Sector-D, Aliganj,
Lucknow - 226 024, India
E-mail: ncshah@lwl.dot.net.in

Indonesia

INRIK

Indonesian Resource Center for Indigenous Knowledge
Prof. Kusnaka Adimihardja, Director (Correspondent)
Padjadjaran University
Ruang K-3, Jl. Dipati Ukur 35
Bandung 40132, West Java, Indonesia
Tel./fax: +62-22-250 8592.
E-mail: inrik@melsa.net.id
<http://www.melsa.net.id/~inrik>

INRIK will soon receive in Bandung the international travelling exhibition 'Rainforests for Health', which is currently touring Indonesia. The exhibition is sponsored by the Rainforest Medical Foundation (RMF). In December 1999, it was on show in Denpasar on the island of Bali. In February 2000, the Java tour began with a first show in Surabaya, which will be followed by a show in Yogyakarta in March. An INRIK committee is preparing for the exhibition's arrival in Bandung in April.

INRIK is also preparing a training programme for non-government organizations and other organizations that are interested in undertaking research on indigenous knowledge systems in Indonesia, especially in the eastern part of the archipelago.

Philippines

PHIRCSDIK

Philippine Resource Center for Sustainable Development and Indigenous Knowledge
Dr Rogelio C. Serrano, National Coordinator (Correspondent)
Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD)
Paseo de Valmayor
P.O. Box 425, Los Banos, Laguna
The Philippines
Tel.: +63-94-500 15 to 500 20.
Fax: +63-94-536-0132/0016.
E-mail: rserrano@ultra.pcarrd.dost.gov.ph

REPIKA

Regional Program for the Promotion of Indigenous Knowledge in Asia
International Institute of Rural Reconstruction (IIRR)
Silang, Cavite 4118, The Philippines
Tel.: +63-969-9451 or +63-2-582659.
Fax: +63-2-522 2494.
E-mail: iirr@phil.gn.apc.org
<http://www.cav.pworld.net.ph/~iirr/>

Sri Lanka

SLARCIK

Sri Lanka Resource Centre for Indigenous Knowledge

Prof. R. Ulluwishewa, Director (Correspondent)
University of Sri Jayewardenapura
Forestry Building, Nugegoda, Sri Lanka
Tel.: +94-1-852 028/865178.
Fax: +94-1-852 604.
E-mail: rohana@sjp.ac.lk

EUROPE

Georgia

GERCIK

Georgia Resource Center for Indigenous Knowledge
D. Kirvalidze, Director/Coordinator
Dr D. Kikodze, Correspondent
Institute of Botany
Georgian Academy of Sciences
Kodjorl schosse #1, 380007 Tbilisi
Georgia
Tel.: +995-32-222 969/988276.
Fax: +49-51-518 633.
E-mail: dato@botany.kheta.ge

Greece

ELLRIK

Elliniko Resource Centre for Indigenous Knowledge
Dr C. Lionis, Coordinator (Correspondent)
Medical School, Department of Social Medicine
University of Crete
P.O. Box 1393, Heraklion, Crete, Greece
Tel.: +30-81-394 621.
Fax: +30-81-542 120.
E-mail: lionis@fortezza.cc.ucl.ac.gr

The Netherlands

CIRAN

Centre for International Research and Advisory Networks
Mr G.W. von Liebenstein, Director
Nuffic-CIRAN
P.O. Box 29777, 2502 LT The Hague
The Netherlands
Tel.: +31-70-4260 321.
Fax: +31-70-4260 329.
E-mail: ciran@nuffic.nl
ikdm@nuffic.nl
<http://www.nuffic.nl/ciran/index.html>

We would like to direct readers' attention to the inside front cover, where you will find a revised version of 'Focus'. Focus now provides a framework for the Indigenous Knowledge and Development Monitor and places the journal within the context of the other activities of Nuffic-CIRAN in the field of indigenous knowledge (IK). These are increasingly integrated into the centre's role as knowledge broker and clearing house, which fits into the Nuffic strategy of 'Linking knowledge worldwide'. This role, and the relationships among the various IK products and services, are particularly apparent in the Indigenous Knowledge Information System which CIRAN has set up. It is hoped that the system's many users will continue to provide valuable

input. Only through continuous contributions from the field—from the 'owners' of knowledge—can the information system reach its full potential.

Another part of the Indigenous Knowledge Information System we would like to tell you about are the mailing lists. Facilitating these lists is yet another way in which Nuffic-CIRAN seeks to encourage discussion and the exchange of information regarding indigenous knowledge and development. The first CIRAN-facilitated mailing list was the Ethno-Veterinary Mailing List (EVM), which fosters networking on the subject of local animal healthcare and production. EVM started in June 1999 and already has some 170 members. In February 2000, a second CIRAN-facilitated mailing list was launched at the initiative of the Indigenous Knowledge and Biodiversity Working Group at the Environment Liaison Centre International (ELCI) in Nairobi, Kenya. The new list is called 'Africadiv' and it is devoted specifically to the sustainable use and conservation of biological diversity and indigenous knowledge in Africa. Already the Africadiv mailing list has over 130 members. CIRAN manages the organizational aspects of the list; its content is managed by Ernest Rukangira of ELCI. The list is owned by the Working Group.

In the year 2000, CIRAN will continue its cooperation with UNESCO in the field of indigenous knowledge, in particular with regard to the integration of indigenous knowledge into global science. This cooperation started in 1999, when Nuffic-CIRAN was commissioned by UNESCO, through its MOST programme (Management of Social Transformations), to identify and record 'best practices' in the field of indigenous knowledge. The project resulted in the inclusion of 27 best practices in an online database (<http://www.unesco.org/most/bpikreg.htm>) and in a publication that was distributed at the UNESCO General Conference in November 1999. This cooperation with UNESCO's MOST programme will continue in 2000. Meanwhile, other sections of UNESCO are beginning to show interest in the issue of indigenous knowledge. In February 2000, Nuffic-CIRAN was contracted by UNESCO's Information and Informatics Division to develop a way to incorporate techniques for dealing with IK into the work of multipurpose community telecentres (MCTs). As part of the contract, there will be a pilot project at Nakaseke Telecentre in Uganda, which will be conducted in close cooperation with local stakeholders. (See also the guest column in this issue of the Monitor, by Dr Z.M. Nyiira, executive secretary of the Uganda National Council for Science and Technology (UNCST).)

In the previous issue of the Monitor (Vol. 7, no.3, November 1999) we described CIRAN's involvement in the initiative of the International Labour Organization (ILO), through its INDISCO programme, to establish community-based indigenous

knowledge resource centres in the Philippines. CIRAN director Mr Guus von Liebenstein is assisting the national ILO-INDISCO coordinator in the Philippines, Mr Domingo Nayahangan. They are now finalizing a project proposal under the title *Harnessing indigenous knowledge systems and practices for environmental protection, biodiversity conservation and sustainable development*, which is about to be submitted to donors for funding.

CIRAN's director will be present at the Second Global Knowledge for Development Conference, which will be held on 7-10 March 2000 in Kuala Lumpur, Malaysia. Mr Von Liebenstein will be on the panel, organized by the IFAD, which will discuss indigenous knowledge.

LEAD

Leiden Ethnosystems And Development Programme

Professor L. Jan Slikkerveer, Director
Ms Diana Bosch, MA, Correspondent
Institute of Cultural and Social Studies
Leiden University
P.O. Box 9555, 2300 RB Leiden
The Netherlands
Tel.: +31-71-527 3469 / 3403.
Fax: +31-71-527 3619.
E-mail: bosch@fsw.leidenUniv.nl

Please note that LEAD has a new correspondent and a new e-mail address.

The LEAD programme is pleased to report that its director, Professor L. Jan Slikkerveer, has been appointed 'Professor in ethnobotanical knowledge systems with regard to medicinal plants in developing countries' at the National Herbarium of the Netherlands at Leiden University. This is the first professorial chair on the European continent in the new field of indigenous knowledge systems (IKS). Professor Slikkerveer will give his inaugural lecture on 4 April in Leiden.¹

Ms Diana Bosch, MA, has taken over LEAD's secretariat from Ms Margot Starkenburg, who continues to work part-time on her research on cosmologies. Apart from handling regular tasks, Ms Bosch will help to prepare the international MA course in Medical Anthropology and Ethnobotany that is currently being developed at Leiden University.

In September 1999, Professor Slikkerveer visited Universitas Brawijaya in Malang, Indonesia, presenting an introduction to the university staff on LEAD's work in Leiden in the field of IKS. During the visit, it was confirmed that a second centre for indigenous knowledge in eastern Indonesia will soon be established under the name Malang Resource Centre for Indigenous Knowledge (MALRIK). Together with Professor Brusckhe, Professor Slikkerveer also visited Universitas Padjadjaran in Bandung, where both gave presentations at a workshop entitled *International training in medical anthropology and ethnobotany*.

In November 1999, Professor Slikkerveer visited the Greek centre for indigenous knowledge ELLRIK and the University of Crete, where he gave a lecture on the complementarity of herbal medicine in primary health care.

In addition to the three postgraduate students from Panteion University (Athens, Greece) who are already at work in Leiden, a number of visiting scientists and staff members have recently joined LEAD for advanced research and training in IKS.

- Mr Yeshanew Gheneti is finalizing his PhD thesis on the role of indigenous institutions in the development of local communities in Africa.
- Mr Walter E. Schrader, MD, has started work on a PhD thesis on traditional treatment of eye diseases in West Africa.
- Ms Alfreda Ibui, collection manager and database coordinator at the Department of Palaeontology of the National Museums of Kenya (NMK) in Nairobi, returned to Leiden in January to finalize her Kenya fossil plants website and to prepare for placing NMK's palaeontological collections on CD-ROM.
- Ms Mary Muungu, also a collection manager at the NMK, has begun a programme of postgraduate training in indigenous knowledge systems and material cultures, in conjunction with the Reinwardt Academy in Amsterdam.
- Mr Wai'l E. Abdalla, MSc, research fellow and curator of the Herbarium of the Medicinal and Aromatic Plants Research Institute (MAPI) of the National Centre for Research, Khartoum (Sudan), has begun PhD research on indigenous knowledge as a natural recourse, specifically with regard to medicinal plants in the Sudan.
- Florence Bindels-Trève, LEAD correspondent in Ghana, is exploring possibilities for combining traditional, transitional and modern medical systems for the benefit of the people of the Damongo/Mole Sub-District, who are currently without modern health care facilities.

¹The formal inaugural oration of Professor L.J. Slikkerveer will be held on 4 April 2000 at 16:00 hrs in the Great Hall of the Academy Building of Leiden University, Rapenburg 73, Leiden. For invitations to the ceremony and reception, please contact the LEAD correspondent at the address above.

Russia

RURCIK

Russian Resource Centre for Indigenous Knowledge

Dr Yevgeny Fetisov, Director
(Correspondent)

EkoNiva, P.O. Box 1, Nemchinovka-1,
Moscow Region, Russia 143013

Tel.: +7-095-591-8487.

Fax: +7-095-591-8275.

E-mail: 100630.157@compuserve.com

LATIN AMERICA

Brazil

BRARCIK

Brazilian Resource Centre for Indigenous Knowledge
Dr A.J. Cancian, Director (Correspondent)
UNESP, Dept. Biologia
14870.000 Jaboticabal, SP, Brazil
Tel.: +55-163-232 500.
Fax: +55-163-224 275.
E-mail: brarcik@jab000.unesp.ansp.br

Mexico

RIDSCA

Mexican Research, Teaching and Service Network on Indigenous Knowledge (Red de Investigacion, Docencia y Servicio en Conocimientos Autoctonos)
Dr Antonio Macías-López, Coordinator (Correspondent)
Colegio de Postgraduados
Campus Puebla
Apartado Postal 1-12
C.P. 72130
Col. La Libertad, Puebla, Pue., Mexico
Tel.: +52-22-851 442/851 448/851 447.
Fax: +52-22-851 444.
E-mail: mantonio@colpos.colpos.mx

Uruguay

URURCIK

Uruguayan Resource Centre for Indigenous Knowledge
Pedro de Hegedüs, Coordinator (Correspondent)
CEDESUR
P.O. Box 20.201
Sayago, Montevideo 12.900, Uruguay
Tel. / fax: +5-982-308 1603.
E-mail: phagedus@adinet.com.uy

Venezuela

VERSIK

Venezuelan Resource Secretariat for Indigenous Knowledge
Dr Consuelo Quiroz, National Coordinator (Correspondent)
Centre for Tropical Alternative Agriculture and Sustainable Development (CATADI)
University of The Andes, Núcleo 'Rafael Range'
Apartado Postal # 22
Trujillo 3102, Estado Trujillo
Venezuela
Tel. / fax: +58-72-360 467.
Mobile tel.: +58-14723 0120.
E-mail: consuelo@cantv.net

In response to questions she has received, VERSIK's coordinator Dr Consuelo Quiroz would like to explain her organization's exact structure. VERSIK stands for Venezuelan Resource Secretariat for Indigenous Knowledge. The actual centre is CATADI (Center for Alternative Tropical Agricultural and Sustainable Development). VERSIK is just one of CATADI's programmes. CATADI has also

created an NGO, FUNDATADI (Foundation for Tropical Alternative Agriculture and Sustainable Development). The activities and projects of these bodies currently include:

- Study of indigenous knowledge systems related to traditional food plants (financed by the National Council for Technical and Scientific Research - CONICIT).
- Study of the *conuco*, home garden, and its potential for the *in situ* conservation of biodiversity in food plants (financed by IPGRI).
- Local development and education (financed by the Kellogg foundation).

These projects have three elements in common: indigenous knowledge, a gender approach, and biodiversity conservation. VERSIK would like to repeat the call made in the November 1999 issue of this journal for postgraduate students from all over the world to come and do their thesis research in the context of one of these projects (see *IK&DM* 7(3) p. 25). Proficiency in the Spanish language is required. More information can be obtained directly from Dr Consuelo Quiroz at consuelo@cantv.net

MIDDLE EAST

Iran

RRC

Rural Research Centre Iran
Dr Mohammed H. Emadi, Deputy Head
Seyed Babak Moosavi, Correspondent
Ministry of Jihad
P.O. Box 14155-6197
Teheran, Iran
Tel.: +98-21-889 7197.
Fax: +98-21-654 152.
E-mail: rrciri@neda.net

NORTH AMERICA

Canada

CTK

Centre for Traditional Knowledge
Edmund Gus, Manager
Canadian Museum of Nature
240 McLeod Street
East Wing 3rd Floor
Ottawa, Ontario
Canada K1P 6P9
Tel.: +1-613-566 4751.
Fax: +1-613-566 4748.
E-mail: egus@mus-nature.ca

United States of America

CIKARD

Center for Indigenous Knowledge for Agriculture and Rural Development
Dr Norma Wolff, Acting Director
318B Curtiss Hall
Iowa State University
Ames, Iowa 50011, USA
Tel: +1-515-294 9503.
Fax: +1-515-294 1708.

E-mail: cikard@iastate.edu
nhwolff@iastate.edu
http://www.public.iastate.edu/~anthr_info/cikard

ICIK

Interinstitutional Consortium for Indigenous Knowledge
Ladi Semali, Director (Correspondent)
The Pennsylvania State University
254 Chambers Building
University Park, PA 16802, USA
Tel.: +1-814-865 6565.
Fax: +1-814-863 7602.
E-mail: lms11@psuvm.psu.edu
<http://www.ed.psu.edu/ci/ICIK/index.html>

Calls

FOR PAPERS

Regional autonomy, local cultures, national integration

On 1-4 August 2000 an international symposium and workshop will be held at the University of Hasanuddin, Makassar (South Sulawesi), in Indonesia. The event is being organized by the editors of the *Journal Antropologi Indonesia* at the Department of Anthropology, the Faculty of Social and Political Sciences of the University of Indonesia. They are collaborating with four partners: the Department of Anthropology at Hasanuddin University; the Department of Anthropology, RSPAS, of the Australian University; the National Museum of Ethnology in Osaka (Japan); and the Center for South East Asian Studies at Kyoto (Japan). The symposium is entitled *The beginning of the 21st century: Endorsing regional autonomy, understanding local cultures, strengthening national integration*. There will be four panels, with the following themes:

- Local resource management: between 'productivity' and 'sustainability'
- Endorsing regional autonomy: re-empowering local institutions
- Peril in focus: redefining the cultures of bureaucrats and the military
- 'Unity in diversity': is it still possible?

The four themes are related to the present situation in Indonesia. At the beginning of the third millennium, Indonesians face a multitude of problems that include national disintegration and other problems of nationhood. Much has to be done to overcome these problems, including a change in the social order. An initial step that must be taken to this end is to gain a comprehensive understanding of the various conditions, potentials and constraints faced by the many segments of society, especially in response to increasing regional autonomy

in years to come. Without such understanding, and without the participation of the local communities themselves, then there will be no real difference in the patterns of policies enacted to overcome crises and improve on the people's welfare.

The organizers call for papers and participation from scholars, researchers, practitioners, observers, decision-makers, donor agencies, the press and any one else in Indonesia or abroad who has an interest in the subject. This year the focus will be on the diverse cultures and social institutions of local communities in Sulawesi, Maluku and Irian Jaya. It is envisaged that the other regions will be similarly covered in subsequent years: i.e., Sumatra, Riau and Kalimantan in 2001; and Java, Bali, and Nusa Tenggara in 2002.

Participants are expected to present the findings from their research or facilitative action in one or more local communities, and among various stakeholders, of Sulawesi, Maluku or Irian Jaya. Papers may be theoretical, conceptual or analytical discussions, or present the latest ethnographic and empirical findings on social-cultural phenomena related to the themes.

ABSTRACTS of no more than 300 words must be received by the Steering Committee at the University of Indonesia no later than 31 March 2000. The final date for full papers (if selected) is 30 June 2000. The selected papers will be published in the *Jurnal ANTROPOLOGI INDONESIA* vol.25 (3 editions) 2001.

For more information, contact: Steering/Organizing Committee of the International Symposium and Workshop - Jurnal ANTROPOLOGI INDONESIA, Dept. of Anthropology, Faculty of Social and Political Sciences, University of Indonesia, Building B, 3rd Floor (B.306), Depok 16424, Indonesia.
Tel.: +62-21-7888 1032.
Fax: +62-21-7888 7749.
E-mail: antrop@centrin.net.id
See also the website at:
<http://www.angelfire.com/journal/antrop/index.html>

FOR SYMPOSIA AND PAPERS

Ethnobiology, biocultural diversity, and benefits-sharing

The International Society of Ethnobiology (ISE) will hold its 7th Congress in Athens, Georgia, USA, 23-27 October 2000. The theme of the congress, symbolized by the turtle, is Earth in the next century. Attention will focus on ethnobiology's role in maintaining biocultural diversity and ensuring equitable benefits-sharing and open dialogue with traditional and indigenous research collaborators.

Since its founding in 1988 in Belém, Brazil, the ISE has met every two years. Congresses have been held in Kunming, China (1990), Mexico City (1992), Lucknow, India (1994), Nairobi, Kenya (1996), and Whakatane, New Zealand (1998). This is

the first time that the ISE will hold its congress in the USA. We expect a strong representation of U.S. and Canadian indigenous groups, as well as traditional peoples from Mexico and other parts of Latin America. Thus far most of the information about the congress has been disseminated via the Internet. This call is meant to reach interested people and organizations—in Africa and elsewhere—who do not have access to the Internet. The organizers hope especially to reach indigenous groups involved in issues of biodiversity, ethnobiology, intellectual property, etc.

You are invited to submit papers on the following subjects:

- Ethnobiology of human health
- Intellectual property rights and ethnobiological research
- Conservation of biological and cultural diversity
- Sustainable development of plant resources
- Collaborative research protocols
- Benefits-sharing and drug discovery
- Initiatives by indigenous, traditional, and local communities and scientists to conserve biological diversity.

Following the traditional format, the 7th Congress will be preceded by a number of pre-congress training workshops which focus on topics relevant to particular geographical areas or specialized interests. The workshop topics include: Prior informed consent; Ethnobotany and education; Balancing local preservation and global benefit-sharing; People and plants: cultural perspectives on conservation; Ethnobiological knowledge and public health; Ecological change; Cultural transition; and Human health. Other topics may also be volunteered.

Please send your abstracts (no more than 500 words) before 1 July 2000, preferably by e-mail, to rstepp@uga.edu or by mail to: 7th International Congress of Ethnobiology, c/o John R. Stepp, Department of Anthropology, The University of Georgia, 250 Baldwin Hall, Athens, GA 30602-1619, USA.

For more information, please check our website at:
<http://guallart.dac.uga.edu/ISE>

Conferences

COMING

From the sources of knowledge to the medicines of the future

Metz (France)
11-13 May 2000

The Société Française d'Ethnopharmacologie is organizing this 4th European colloquium on ethnopharmacology in cooperation with the Institut Européen

d'Ecologie and the European Society of Ethnopharmacology. The international congress will have three themes: 'Origins of traditional pharmacopoeias', 'Elaboration of pharmacopoeias' and 'Medicines of the 21st century'. Monitor readers will be particularly interested in the second and third days. On Friday, 12 May, there will be introductory lectures on pharmacopoeia in traditional Chinese medicine (by Professor Ke-ji Chen) and on traditional veterinary medicine (by Professor Michel Ansay and Dr Jean Lehmann). In the afternoon there are two forum discussions. The first one has as title 'Folk and scholarly knowledge: the source of knowledges' and the second one 'From laboratory to field-integrated development and public health'. The latter includes a presentation by Dr Jean-Pierre Nicolas: 'Combining traditional and scientific knowledge in Central America'. The third day offers, among other things, the following lectures: 'Clinical evaluation: the efficiency and efficacy of phyto-anti-inflammatory drugs' (by Dr Sigrun Chrubasik), and 'Designing an anti-malaria medicine on the basis of traditional knowledge of plants' (by Professor Guy Balansard). In the afternoon an international panel will discuss the rules and regulations of plants-based medicine in France and China.

For more information, contact: Société Française d'Ethnopharmacologie, 1, rue des Récollets, 57000 Metz, France.
Tel. / fax: +33-387-74-88 89.
E-mail: sfe-ee@wanadoo.fr
See also the website at:
<http://perso.wanadoo.fr/sfe-see>

Native solutions - IK and today's fire management

Hobart (Australia)
6-8 July 2000

Tasmania's Parks and Wildlife Service and the Tasmanian Aboriginal Land Council invite managers, researchers and indigenous communities to participate in an inter-disciplinary forum which will consider the role of indigenous knowledge, technologies and peoples in contemporary fire management.

The symposium will explore the issue's enormous implications for social and economic risk management, concepts of biodiversity, and the place of people in the natural world. The event is intended to provide an international platform for people involved in land management, including local communities and researchers. Together they will explore the diverse array of issues relating to fire management—with a focus on the knowledge and participation of indigenous peoples.

In recent years there has been growing appreciation for the traditional practices of indigenous peoples pertaining to fire ecology. In Tasmania, tentative steps are now being taken to evaluate and experimentally re-introduce practices which parallel the burning regimes

maintained by Aboriginal people over several thousand years. But exclusion has been a key management principle in recent decades. For this reason, any proposal for the active reintroduction of fire into an area will require careful planning and considerable consultation. The risks to public safety and assets, the threat to fire-sensitive vegetation, and the implications for biodiversity conservation are all important issues for debate. At a more fundamental level, questions are being raised about the ethics of active landscape manipulation, the objectives of biodiversity management, and the value that should be assigned to the wilderness landscape.

The symposium will have an interdisciplinary character. It will therefore appeal to a wide range of researchers and practitioners in such fields as land management, fire and vegetation ecology, and environmental values. It is expected that significant contributions will be made by representatives of indigenous communities and others who have an interest in the management of natural and cultural resources.

Reviewed papers and the proceedings of the symposium will be published as a record of the symposium's outcomes.

For early registration and more information, please contact: Greg Lehman, Project Manager, Aboriginal Partnerships World Heritage Area, Policy & Planning Section, Parks & Wildlife Service, Department of Primary Industries, Water & Environment, GPO Box 44A, Hobart, Tasmania, 7001 Australia.

Tel.: +61-362-33 2109.

Fax: +61-362-33 3477.

E-mail: glehman@dpiwe.tas.gov.au

See also the website at:

<http://www.parks.tas.gov.au/manage/manage.html>

PAST

Revitalization and conservation of traditional games as educative media

Malang (Indonesia)

28-30 August 1999

This workshop was organized by Yayasan Semesta Biru (YASERU) and the Center of Environment Education (PPLH). The World Bank's Center of Environment Education sponsored the event.

The aim of the workshop was to gather together data on traditional games, to analyze this data, and then to develop new games that can be integrated into formal education. The main driving force behind the workshop was a widely shared concern about the way that traditional games are rapidly vanishing and being forgotten. With the disappearance of these games, indigenous knowledge and humanistic values are also disappearing, and there is a risk that they will be replaced entirely by commercial, violent games—and values.

The workshop's organizers realized

that there is a lack of knowledge about the content and potential of traditional games, and that there are many misconceptions about playing and learning. As a result of the workshop, a group was set up under the name Children's Traditional Game Communication Forum (Forum Komunikasi Permainan Tradisional Anak). The Forum is planning various follow-up activities in 2000. These include fieldwork to collect more information about traditional games (in February-March); an analysis of the games in terms of their potential for use in schools (April-June); hands-on workshops to try out the games in cooperation with teachers, NGOs, and government agencies in the field of education (August); and finally, trials in schools in order to obtain feedback for the further development of useful, traditionally based games (September).

For the medium to long term, the Forum is planning to publish brochures, leaflets, educational comic books, and posters; to develop audio-visual aids; and to write theoretical articles. Festivals, competitions and exhibitions will be held in the various regions covered by the participating organizations.

(Ina Irawati, of Yayasan Semesta Biru)

For more information, please contact:

Ina Irawati, Yayasan Semesta Biru, Perum Vila Bukit Sengkaling AJ-11 Dau - Malang Jawa Timur 65151, Indonesia.

Tel.: +62-341-461 238.

Fax: +62-341-462 190.

E-mail: yaseru@mlg.globalinfo.net

Agro-ecology and soil and crop management among indigenous cultures

Salt Lake City (USA)

1 November 1999

A symposium on indigenous knowledge of agriculture and traditional agricultural systems was held during the 1999 annual meetings of the American Society of Agronomy-Crop Science Society of America-Soil Science Society of America (ASA-CSSA-SSSA). The symposium was organized by the group of soil and crop scientists, ecologists, and anthropologists who are involved in an interdisciplinary study of runoff agriculture among the Zuni, a Native American people in the southwestern U.S. The main purpose of the symposium was to present studies that scientifically document traditional knowledge of crops, soils, and agricultural management, and to increase agricultural scientists' awareness of the concepts and applications of indigenous knowledge. Although several past symposia at these meetings have included aspects of indigenous knowledge, this was the first symposium devoted entirely to the subject.

The symposium consisted of oral presentations followed by a session in which 27 posters were presented. The symposium was well attended, with about 65-125 people in the audience for the oral presentations. The poster session, presenting a wide range of issues and case

studies, allowed participants to meet and interact in small groups.

The symposium was diverse in terms of topics, geography, and disciplines. The topics included investigations of traditional agroecosystems; past and present human-environmental relationships; conservation of natural and agricultural resources (e.g., crop genetic resources); documentation of traditional knowledge; relationships of research and researchers to indigenous peoples and their agricultures; and alternative, more sustainable approaches to development. The posters were arranged in categories: crop science, soil science, integrated agricultural systems, range management, agroforestry, and socio-economic research.

The presentations covered a wide geographic and temporal range. This was necessary in order to reflect the geographic diversity, knowledge of local environments, and long-term perspective and adaptation that are hallmarks of indigenous cultures. Studies from Asia, Africa, the Americas, and the Pacific Islands were presented, concerning peoples with ancient, historic, and contemporary agricultural systems. The importance of multidisciplinary participation in traditional agriculture research was emphasized by inviting presenters from the social sciences, including anthropology, archaeology, sociology, and geography, in addition to presenters from the natural sciences and the subdisciplines of crop and soil science.

The full programme and list of presenters, along with abstracts of all papers, can be found in the programme guide and book of abstracts available from ASA. Plans to publish the symposium papers are presently under consideration. We hope that this symposium will lead to more visible recognition of indigenous knowledge and related studies at future ASA-CSSA-SSSA meetings.

(Jon Sandor, Iowa State University; Jay Norton, University of Montana; Steve Williams, University of Wyoming; Deborah Muenchrath, Iowa State University)

To obtain the programme guide and/or abstract book, please write to: American Society of Agronomy, 677 S. Segoe Road, Madison, WI 53711-1086, USA.

See also the website at:

<http://www.agronomy.org/>

Research, projects

Aboriginal fisheries in New South Wales, Australia

A project to describe Aboriginal fisheries in New South Wales (NSW), Australia, got underway in early 1999. The project is funded by the Australian

Commonwealth Government's Natural Heritage Trust, through the Fisheries Action Program. Three broad geographical regions will be covered: northern NSW, where work is nearing completion; and southern and western NSW, which will be studied in the second and third years of the project. Indigenous fisheries knowledge (IFK) will be recorded and the issues related to it will be identified.

Indigenous fishing in NSW is not well understood by outsiders. Fish is a traditional food of Aboriginal people, but nowadays they are forced to observe the regulations and catch restrictions of the recreational fishing sector. A key problem has been that the fishing efforts of an Aboriginal family or community are often concentrated—that is, an individual or a small group may fish for others as well as themselves. Thus their catch appears excessive and is often in breach of regulations. Aboriginal fishermen are therefore frequently fined and prosecuted. Not only does this stifle their fishing activities, it also discourages Aboriginals from passing on their knowledge and practices to the younger generation. Enforcement of regulations designed for recreational fishing therefore counteracts efforts to preserve IFK.

The project has a major consultative component. Researchers ask the communities to identify the fishery resources they currently use. During these discussions, the subject of indigenous knowledge itself is raised, and the value of its potential documentation. The researchers explain why and how this knowledge should be treated as intellectual property, and discuss the protocol of fully informed prior consent in the context of the project.

Up to now the researchers' experiences with the IFK component have been mixed. The majority of people they have talked to are hesitant to have any IFK formally recorded. Some people have expressed willingness to cooperate on condition that their own cultural protocols are observed. Among other things, this means that the approval of Elders is required.

Factors that hinder the recording of IFK have been identified. The main problem is that people worry that they will have no control over who uses the recorded information and how. Many communities lack the infrastructure to store and safeguard recorded knowledge to their satisfaction. Also, the cultural protocols associated with IFK require a special consultative approach. Communities need to feel confident that they will not lose control over the recorded information, and more time and resources are needed in order to consult and engage Elders. If this is not done, little progress can be made in recording the significant amount of IFK that does exist.

The project is also hampered by external factors which affect Aboriginal fisheries in general. These include the lack

of recognition of Aboriginal fisheries and fishing rights, the history of deceit and inaction on the part of governments and previous researchers, and the lack of legislative protection for indigenous intellectual property.

Their experiences have sharpened the researchers, and the continuation of the project elsewhere in New South Wales will benefit from what they have learned. It is envisaged that the project, when complete, will contribute to a better understanding of Aboriginal fisheries in NSW on the part of natural-resource managers, students, and the commercial and recreational fishing sectors.

For more information please contact: Associate Professor Stephan Schnierer, project coordinator, or: research officer Adam Faulkner, Indigenous Environmental Research Centre, College of Indigenous Australian Peoples, Southern Cross University, Lismore, Australia. Tel.: +61-2-6620 3542. Fax: +61-2-6620 3958. Email: afaulkne@scu.edu.au

Publications

Bayer, Wolfgang, and Ann Waters-Bayer (1999) *La gestion des fourrages*. 246 pp. ISBN 3-8236-1309-X. DEM40; USD30 plus fee for postage. Translated by Jean-Michel Brohée and Edith Meyer. Supported by CTA and GTZ. Margraf Verlag, P.O. Box 1205, D-97985 Weikersheim, Germany. Tel.: +49-79-3430 71. Fax: +49-79-3481 56. E-mail: margraf@compuserve.com

This book is a French translation of *Forage husbandry*, published in 1998 by Macmillan Education Ltd. Ning Wu reviewed the English version in the Indigenous Knowledge and Development Monitor of July 1999 (*IK&DM* 7(2), p. 29). The two authors have had long and distinguished careers in rural development, agriculture and pastoralism, which have taken them all over Africa and the tropics. Their work on indigenous knowledge has featured in earlier issues of this journal.

The book begins with a detailed discourse on different kinds of farming and herding around the world: nomadic pastoralism, sedentary agro-pastoralism, mixed farming, and urban and pre-urban farming. The technical background to livestock feeding and nutrition which follows includes descriptions of the composition and digestibility of the main forage groups. The book then goes on to review indigenous practices relating to the management of livestock grazing (e.g. free grazing, zero-grazing, tethered grazing) and the management of different kinds of fodder (naturally occurring fodder, fodder as a by-product of other plant use, cultivated fodder). In the chapter on the

conservation of fodder crops, the authors review traditional haymaking and silage production. They also discuss how farmers supplement forage with minerals, by-products, and kitchen scraps. Finally, the chapter entitled 'Research and development in fodder management' shows the progression from conventional R&D to a more participatory approach that acknowledges what local people know about using fodder.

The book is very readable and is well illustrated with photographs, tables, and graphs. Its annexes would be useful for fieldwork; they contain lists of important forage plants divided by species and cultivars, a glossary, and a list of further reading. I recommend this text for francophone development workers, extension agents, and anyone interested in the sustainable management of livestock. (Marina Martin, Projects Co-ordinator, VETAID, UK. E-mail: mail@vetaid.org, <http://www.vetaid.org>)

Berkes, Fikret and Carl Folke (eds) (1998) *Linking social and ecological systems: Management practices and social mechanisms for building resilience*. 437 pp. ISBN 0-521-59140-6. GBP50. Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU, UK. Tel.: +44-1223-312 393. Fax: +44-1223-315 052.

In thinking about sustainable development, scientists, policy-makers and activists alike struggle to understand the dynamic equilibrium between human behaviour and the environment. *Linking social and ecological systems* explores a new approach to understanding natural resource management and sustainable development at the micro- and macro-levels of human ecology. This edited volume explores the interplay between social and ecological systems by investigating different areas of human-ecosystem interactions from a holistic perspective which views social systems (including socio-cultural, economic and political structures) and ecological systems (including fisheries, farming and silviculture) as a single entity. The volume represents a significant departure from the boundaries of disciplinary science, which traditionally study either social or ecological systems while viewing the other as a separate 'black box' or constant factor. The view promoted here, of the social and the ecological as a single integrated system which is best researched and managed as a whole, is an important step in natural resource management.

This work is the product of the Beijer International Institute of Ecological Economics of the Swedish Academy of Sciences, and is edited by Fikret Berkes (Natural Resources Institute, University of Manitoba, Canada) and Carl Folkes (Beijer Institute). The contributors are experts drawn from different areas of natural resource management in different parts of

the world. The contributors and editors together have produced a powerful work.

The strength of this volume lies in the breadth of distinctive contributions which are all based on a common conceptual framework. The framework is built using ideas which are familiar to anyone working in fields related to sustainable development: local property rights, ecological resilience, adaptive management, and local knowledge. These ideas are blended with a strong emphasis on a systems approach, allowing the examination of individual elements without losing sight of the whole. The framework provides the common foundation on which the subsequent chapters build. For example, the definitions of all key terms are defined and explored at the start of the work, and then used in a consistent manner throughout—a rare occurrence in edited volumes.

The body of the work is comprised of four sections, each focussing on a different theme within the conceptual framework: approaches to learning from local systems; the emergence of new and adaptive systems; the relationship between local experiences and national or regional forces; and methods for employing new understandings in order to design new approaches to management. Within these sections each chapter presents a sort of case study. Although concerned with different areas of resource management in different parts of the world, each of these studies addresses how social systems develop management practices based on ecological knowledge, and how these socio-ecological systems are adept at (or ill-suited to) dealing with the fluctuations within ecosystems or socio-economic contexts. Each contribution manages to express unique perspectives without departing from the volume's conceptual framework.

While most of the 15 chapters contain clear arguments and substantive evidence, several contributions stand out as particularly valuable. Gilsa Pálsson's contribution (Chapter 3) on the balance of local and scientific knowledge in the Icelandic fishing industry provides exciting insights into the ways in which overlapping discourses on natural resource management can simultaneously complement and compete against one another. Chapter 7 (by Michael Warren and Jennifer Pinkston) focusses on changing agroforestry practices among Yoruba farmers in Nigeria, illustrating the complexities of simultaneous social and agro-ecological change. Finally, Chapter 12 (by Christopher Finlayson and Bonnie McCay) uses the recent collapse of the Newfoundland cod industry as an example of the ways in which local, regional and international policies and practices combine to place insurmountable stresses on a resource management system. These chapters achieve the brand of holistic interdisciplinary science which the editors promote; in treating social and ecological

systems as an integrated whole, the authors of these chapters achieve closer insights than either approach could achieve alone.

If there is a weakness in this work, it is its implicit geographic bias. The majority of case studies are drawn from the global North. This is unusual for a work concerned with human-ecological interactions, as most of the world's biodiversity, and certainly the greatest human threats to that biodiversity, are located in the global South. This decision is justified by the editors as an attempt to avoid 'isolated groups and anthropological curiosities' (p.18) and focus instead on ecological and social systems which face modern market realities. This rationale rings hollow, however, as it means that relatively little attention is given to the macro-economic realities which face the modern developing world, such as massive trade imbalances, debt burden and structural adjustment (to name but a few). Such topics are conspicuous in their absence. Surely these political and economic forces, as well as purer market forces, are important in shaping the social-ecological behaviour of thousands of local communities? This omission proves to be one of the few shortcomings of an otherwise well-balanced work.

In all, *Linking social and ecological systems* is an important volume which may well signal a new direction in interdisciplinary understandings of natural resource management. Although most of its examples come from the global North, the greatest value of this work lies not so much in its conceptual framework as in the comprehensive thematic approach taken by the editors and contributors. This will be of interest—and more importantly, of use—to almost anyone whose work is related to natural resource management or sustainable development. Readers of IKDM, whether scientists, policy-makers or activists, will find it helpful for understanding and managing the complexities of local social and ecological dynamics.

(Landon B. Myer, South Africa Medical Research Council, Mtubatuba, South Africa)

L.P. Bharara (1999) **Man in the desert. Drought, desertification and indigenous knowledge for sustainable development.** xx + 394 pp. ISBN 8172331932. USD43.30. Scientific Publishers, 5-A, New Pali Road, P.O. Box No.91, Jodhpur 342 001, India. Fax: +91-291-613 480.

Dr L.P. Bharara is an eminent rural sociologist devoted to the study of arid lands, with emphasis on human ecology, socio-economic surveys, agricultural extension and rural development. He recently retired from the Central Arid Zone Research Institute in Jodhpur, Rajasthan (India), where he had served for more than 35 years.

This book is excellent. It examines how the people of the Rajasthan region

of the Thar desert have survived in the midst of drought and desertification. The author looks at the problem from a socio-ecological point of view, showing how people from different castes and economic groups have adopted different strategies. Especially valuable are the detailed accounts of people's perceptions and historical recollections of drought and how it has affected the relationships between land, vegetation, humans and animals. The author also discusses the extent, causes and process of desertification.

Part one describes the setting, and Part two presents the socio-ecological implications. Part three presents the knowledge and perceptions on the basis of which local people have survived in a sustainable way. This part is rich in detail: for example, about how local people forecast the weather, harvest rainwater, conserve and manage land resources as common property, and practise agro-forestry.

Indigenous knowledge, according to the author, is know-how and wisdom acquired through the observation of specific natural and social phenomena in combination with the experience of supernatural powers influencing life. The basis for forecasting the weather and predicting agricultural yields is one form of indigenous knowledge, vital for coping with natural calamities. Villagers in the arid region of Rajasthan have developed their own indicators for predicting drought. Drought occurs frequently enough for the villagers to empirically verify their predictions, which they make on the basis of climatic factors and changes they see in vegetation and animal behaviour, for example. The research shows that climatic factors (rainfall, wind direction, etc.) are the main traditional indicators: more than 80% of the peasant households perceive and interpret these, sometimes as omens. The indicators based on changes in vegetation are second in importance, interpreted by 75% of the households. Half of the households perceive and interpret specific animal behaviour, whereas less than half see certain human behaviours as indicators. The indicators on which drought prediction is based have been woven into the folk culture and are evident in local sayings. Interestingly, social relations are also part of the predictions. For example, it is believed that if on the eve of a festival in March a person is refused a favour by a friend, there will be famine. But if the friend is generous, the year will be good.

Perhaps the most interesting part of the study is the comparison between the villagers' predictions for a given year on the basis of their own indicators, and a description of the same year based on western scientific measurements of rainfall, crop maturity, etc. Were the predictions using traditional indicators accurate or not? Over the 94 years that local predictions have been recorded, the

average accuracy over four categories of indicators proved to be 55%. But if the indicators based on climatic factors and changes in vegetation are considered separately, the accuracy rate goes up to 78% and 68% respectively. This is very accurate indeed. Moreover, the research shows that a holistic perception of natural phenomena provides a truer representation of reality than mere figures about rainfall or modern scientific methods of yield measurements can ever do.

Among the chapters that describe and analyze local knowledge and practices pertaining to the use of land and resources is a particularly fascinating chapter about the traditional methods for harvesting rainwater in Rajasthan. The underground tanks for collecting and storing drinking water (*kunds*) are described in detail, as is their use. Without a *kund*, a household would have to make trips of 10 to 15 kilometres to get water. It was the discovery of these *kunds* by Anil Agarwal and Sunita Narain that inspired them to write their excellent book *Dying wisdom. The rise, fall and potential of India's traditional water harvesting systems*. (See *IK&DM* December 1998, Vol. 6(3), p. 29.)

The last chapter provides valuable insight into the way local people perceived the activities, constraints and achievements of a Desert Development Programme that had focussed on transferring technologies, generating income and developing human resources.

This book is a must for anyone concerned with the problems of drought and desertification, whether as a scientist, planner, policy-maker, student or development worker. The only possible omission is a specific reference to the perceptions and knowledge of women. (*L.Ch. Schenk-Sandbergen, Associate Professor, Anthropological and Sociological Centre, Faculty of Political and Socio-cultural Sciences, University of Amsterdam, the Netherlands*)

Garrett, Martha J. and Claes G. Grandqvist (eds) (1998) **Basic sciences and development: Rethinking donor policy**. xxxiii + 145 pp. ISBN 1-85972-562-7. GBP32.50. Ashgate Publishing Company, Gower House, Croft Road, Aldershot, Hants, GU11 3HR, England. Tel.: +44-1252-331 551. Fax: +44-1252-344 405. E-mail: ashgate@cityscape.co.uk <http://www.ashgate.com>

This book comes at a potentially important time as governments and people in the Asia-Australia region address issues of development with regard to the newly emerging nation of East Timor. The question of how best to assist our newly independent neighbour is on the minds of many people, and some form of long-term planning needs to emerge from what seems, at least on the surface, to be chaos. Garrett and Grandqvist, who have strong scientific backgrounds as well as experience of science in developing countries, have drawn together authors

who have brought a variety of important perspectives to this debate.

The basic message of the articles is that a substantial portion of development money should be directed towards 'capacity building' in the basic sciences in developing countries. Rather than the whole development dollar being devoted to aid projects, some of it should be spent to create a cadre of well-trained indigenous scientists who would be able to apply their knowledge in locally specific and appropriate ways.

The book presents a clear and easily understandable argument in favour of longer-term thinking and the development of local capabilities. Essentially, the authors argue that the proposed diversion of aid money could be the long-term key to breaking the cycle of dependence on external development expertise. In the opinion of the authors, a local culture of science would be a precursor to independently planned and executed development programmes. The topics discussed in the book include the importance of re-shaping the 'basic science' infrastructure in developing countries and strategies for doing so; an assessment of current teaching, research and development trends in these fields in developing countries; and the need to refocus current donor support. The design of the book, with its clear headings and user-friendly navigability, enables the reader to grasp the salient points after only a quick scan.

Given the clarity of the title and the expertise of the authors, the specific nature of these discussions is apparent. The book's focus is an important one. Capacity building in indigenous contexts does, however, need to be thought of in a broader sense as well, where long-term education strategies in the basic sciences play a crucial part. This volume adds an important chapter to the key issue of developing indigenous capacities for research and management. There is little doubt that local people have to be able to negotiate their way through the political and cultural minefields of the contemporary, globalized economic system. But at the same time they need to remain cognisant of and responsive to development in their local context. (*Greg Williams, School of Resource Studies, Faculty of Aboriginal and Torres Strait Islander Studies, Northern Territory University, Darwin, Australia. E-mail: greg.williams@ntu.edu.au*)

Giger, Markus (1999) **Avoiding the shortcut: moving beyond the use of direct incentives. A review of experience with the use of incentives in projects for sustainable soil management**. 61 pp. ISBN 3-906151-32-8. CHF15 for organizations and individuals in the North; free of charge for development organizations and institutions in the South. A Spanish version will be available in May, 2000, and an abbreviated French version in June 2000. Order from: Centre for Development and Environment,

Institute of Geography, University of Berne, Hallerstraße 12, 3012 Berne, Switzerland. Tel.: +41-31-631 8822.

Fax: +41-31-631 8544.

E-mail: cde@giub.unibe.ch

<http://www.cde.unibe.ch>

All versions can also be downloaded from the CDE website at <http://www.cde.unibe.ch/> (see under publications)

This book is of direct practical use to policy-makers, project planners, and project staff. It concerns the use of incentives in projects to improve soil management. The major message is that direct incentives do *not* work. A group of experts, coordinated by Markus Giger from the Centre for Development and Environment of the University of Berne, guide the reader to this conclusion. While we may have ethical, environmental and economic reasons to include direct incentives and subsidy-based approaches in projects, we are shown conceptually and practically why they do not work. The arguments are supported by research from the World Overview of Conservation Approaches and Technologies, and the University of Berne. Highlighted examples based on experiences around the world help readers to understand why direct incentives do not achieve the purposes for which they are intended. The results are discussed of specific projects that used food-for-work or cash-for-work, or that provided inputs or services free of charge or at subsidized rates. The use of direct incentives often keeps projects on schedule, but the results achieved are short-lived.

The report is practical, as evidenced by the 'Checklist for donors and planners' that follows the executive summary. The checklist formulates questions and offers suggestions for action. The report concludes with a 'minimum agenda', which summarizes the findings and makes recommendations. A list of references is provided.

The report points out that other options for furthering sustainable land management do exist and are being used. It outlines the key conditions, instruments and problems associated with these options and discusses the conceptual basis of each. 'The general objective,' says the author, 'should be to increase the options available to resource users.' Three major strategies are proposed for replacing the use of direct incentives:

- 1) Removing constraining factors and working towards gradual improvement of indirect incentives.
- 2) Putting greater emphasis on participatory innovation processes.
- 3) Finding new ways of co-financing resource conservation.

Three types of policy incentives are discussed and examples are provided. Situations are defined in which subsidies for implementing soil conservation could be useful, such as those based on external benefits and public goods.

The report is well structured, well written and attractively laid out, all of which helps to engage the reader in its important content. The report makes a significant contribution both to improving the sustainability of land conservation efforts and to enhancing the role that indigenous knowledge and participatory technology development can play in the sustainable management of land resources.

(Deirdre Birmingham, independent consultant, Alpharetta Georgia, USA.
E-mail: deirdreb@mindspring.com)

Gottschalk-Batschkus, Christine E., Judith Schuler and Doris Iding (eds) (1997) **Frauen und Gesundheit - Ethno-medizinische Perspektiven - Women and health - Ethnomedical perspectives.** 448 pp. ISBN 3-86135-563-9. DEM88 (plus fee for postage). VVB - Verlag für Wissenschaft und Bildung, Berlin, Germany.

Tel.: +49-30-251 04 15.

Fax: +49-30 251 04 12.

E-mail: 100615.1565@compuserve.com

This volume is a special issue (No. 11) of *Curare*, a three-monthly journal for ethnomedicine, produced by the Arbeitsgemeinschaft Ethnomedizin (Society for Ethnomedicine) in Berlin, Germany. It consists of a collection of 52 articles of which 27 are written in German and 25 in English. 47 female and 23 male authors from Europe, Africa, Asia, Canada and Australia contributed to it. Each paper begins with a short abstract in both German and English. The volume ends with a brief index of keywords in both languages.

Because it is impracticable to summarize all 52 manuscripts in a way that would do justice to the individual intentions, significance and power of expression of each contribution, I will limit myself to some observations. This compilation provides an astonishing amount of information and knowledge—mainly rich, culturally informed material. The book's actual *Leitmotiv* is 'women and their struggle for a healthy and satisfying life'. These are described from widely divergent perspectives, discussed by a number of disciplines, and illustrated with stories from various geographical regions. There are a great variety of topics covered in this book and we find in it reports from all over the world. To mention a few: the preparation of girls for adulthood—including its darker sides like teenage pregnancies, sexual violence, female genital mutilation; female concepts of health and sickness and women's quest for healing; images and definitions of motherhood; the impact of traditional practices and modern medical interventions on pregnancy and birth; women as healers, witches, spouses, as sufferers of psychiatric and somatic illnesses, as family carers and midwives; women as underprivileged and discriminated labour migrants in Europe

and Latin America; women as victims of the AIDS pandemic and of economic and political chaos; women as refugees of war.

The chapters, as is usual with this type of joint ventures, vary widely in design and character. There are papers resembling fairy-tale narratives, there are critical essays, detailed enumerations, scientific reports based on quantitative or qualitative research methods with more or less accurate statistics, anthropological texts, historical accounts, pleas for change, calls for research. To my mind, most articles represent the state of the art in their particular fields. What is really missing in this wide-ranging work is a thorough introductory chapter, providing a clear structure with well-defined areas, linking texts with challenging conclusions. On the technical side I find it disappointing to notice very many spelling errors, especially in the English documents.

Overall, however, I find this an admirable piece of work. Yet it is a pity that this wealth of information and knowledge is collected into one single, rather expensive edition, thus creating the risk that only a small circle of insiders in the Western world can benefit from its publication. Many lay persons (women and men alike), researchers and practitioners in developing countries just do not have the resources to purchase such an asset. Apart from that, it will be a problem for many a person to find time to read this volume from cover to cover.

In the preface of this book, Professor Beate Schücking notes that 'the international range of this volume serves to arouse curiosity and to prompt comparison.' Indeed, many contributions are overt or covert invitations to exchange experiences, problems, questions, feelings, ideas, insights and to communicate about possible solutions or to develop alternative approaches. One way to reach larger audiences is by making knowledge more accessible, for instance by producing electronic versions of recorded and/or written material and to disperse these freely via the Internet. I think 'sharing' will become a key word in the next decades, and the Internet is a great tool for that.

(Florie Barnhoorn, University of Amsterdam, Ph.D. Study Centre for Women, Amsterdam, the Netherlands. E-mail: barnhoorn@pscw.uva.nl <http://www.pscw.uva.nl/pwv/tbc/tbc.html>)

Green, Edward (1999) **Indigenous theories of contagious disease.** 313 pp. ISBN 0-7619-8941-2. USD24.95. AltaMira Press, a Division of Sage Publications Inc., 1630 North Main Street, Suite 367, Walnut Creek, California 94596, USA.

E-mail: explore@altamirapress.com

Edward Green is a well-known author who has worked as a medical anthropologist in several countries of Africa, Latin America, the Caribbean, and Asia. Although geographically diverse, the subjects of Green's work and publications

all show his commitment to public health and applied medical anthropology. The majority of Green's research deals with African ethnomedicine, which he has studied for nearly 20 years.

This important new book, *Indigenous theories of contagious disease*, paves the way for effective working relationships between indigenous healers and the providers of biomedical health services, and for more effective health promotion and disease prevention across the world, according to W. Penn Handwerker in the foreword. Green's own opening sentence is pungent: 'The popular stereotype of African indigenous medicine is of magic, witchcraft, sorcery, and spirit possession, set against a background of throbbing drums.' (p.11) Green points out that this focus on witchcraft has blocked the incorporation of ethnomedical findings into public health programmes. He is convinced that health researchers and policy-makers do injustice not only to public health but also to science and medicine if they ignore and dismiss indigenous and personal medical theories in their attempt to mitigate the ravages of infectious disease. (p.18) By not taking into account the people's own beliefs regarding contagion, biomedically trained professionals miss potentially key insights that could have helped them to improve their characterizations of illness and their medical services. Instead, they fail to understand why local people refuse to take their advice or follow their recommendations.

With this study Green wants to bridge the gap between what he terms 'indigenous contagion theory' (ICT) and western biomedical norms of etiology and treatment. He shows that 'contamination' is an African code word for pollution. The word 'contagion' was used by many of the healers he interviewed to refer to what they understood to be infectious diseases: for example the sexually transmitted diseases (STDs) and HIV/AIDS, tuberculosis, malaria, bilharzia, epilepsy, and diarrhoea.

The book contains abundant data showing that indigenous contagion theories occur globally. The data are convincingly presented country-by-country and include descriptions of the concepts and theories maintained by local healers and other respondents regarding infectious diseases. The book also offers a useful graphical summary of indigenous contagion theories and the codewords that are connected with each of them. (p. 87)

As a researcher studying tuberculosis, I found one part of this rich book extremely interesting. Green makes it clear that at present the most detailed research findings available concern STDs and diarrhoeal disease. This, he explains, is because these diseases are the priorities of recent programmes of the World Health Organization (WHO), the World Bank, and other major funders of applied health research in developing countries. Green suggests that other infectious diseases

account for more morbidity and mortality than the higher-profile AIDS—tuberculosis and malaria are two examples. These diseases should be of great interest to researchers, says Green, because they require culturally appropriate interventions, they can increase susceptibility to HIV/AIDS, and they illustrate the range and significance of ICTs.

In the final chapter, Green argues that we are more likely to see health programmes benefit from ethnomedical research if we place emphasis where it deserves to be: not on witchcraft beliefs—which is probably the area of least compatibility between indigenous medicine and Western public health—but on naturalistic understandings of contagious illnesses. I would recommend *Indigenous theories of contagious disease* to medical anthropologists and others who are interested in the bio-socio-cultural and historical underpinnings of ICTs, as well as to anyone with a concern for indigenous knowledge and development. (Mirjam J.E. van Ewijk, *European Research Centre on Migration and Ethnic Relations (ERCOMER), Research Programme: Migration, Health and Social Integration, Utrecht University, the Netherlands.* E-mail: M.vanEwijk@fss.uu.nl <http://www.ercomer.org/staff/MEW.html>)

Haverkort, Bertus and Wim Hiemstra (eds) (1999) **Food for thought. Ancient visions and new experiments of rural people.** 237 pp. ISBN 1-85649-723-2. GBP14.95; USD22.50. Zed Books Ltd., 7 Cynthia Street, London N1 9JF, UK. Tel.: +44-20-7837 8466. Fax: +44-207833 3960. and ETC/COMPAS, P.O. Box 64, 3830 AB Leusden, the Netherlands. E-mail: compas@etcnl.nl

This book is the outcome of a workshop that took place in April 1996 in Bolivia. It was conducted by organizations that are partners in COMPAS (Comparing and Supporting Endogenous Development), which is an international programme designed to explore the diversity of rural peoples' knowledge, to encourage local experimentation based on farmers' own cosmovisions, and to foster inter-cultural dialogue on indigenous knowledge, learning and experimentation pertaining to agriculture, the use of natural resources, and health. In the words of David Millar, director of CECIK (Ghana Centre for Cosmovisions and Indigenous Knowledge) and author of a chapter in the book on traditional African worldviews, 'Cosmvision is a social construct that includes the assumed interrelationships between spirituality, nature and mankind.'

Food for thought presents case studies from different parts of the world. These form the basis for a number of generalizations and conclusions. The book also discusses such subjects as *mantras*, 'bioprospecting', intellectual property rights, gender, relationships with sacred

plants and animals, and the role of astrology in agriculture.

I would like to draw attention particularly to Chapter 3, 'Revitalizing local health traditions', written by Darshan Shankar. He maintains that the key to an appreciation of cultural diversity is to accept the fact that cultures are guided by their own epistemologies. Development agencies usually see these as a set of superstitions. It is important to work with traditional institutions, however, and this requires tact and social skills. Outsiders should not only accept and respect the decision-making and community processes particular to the community in question, but also be prepared to take part in those processes.

The book shows how rituals have been used in many parts of the world to enhance crop growth and animal husbandry and to chase away wild animals or pests that damage the crops. Farmers' perceptions and understanding of ecology, crops, land, labour, livestock and agricultural implements are based on knowledge received from their elders as well as on their own long experience in the natural laboratory of their fields.

Throughout the book we find examples of how indigenous knowledge systems are rapidly losing ground as a result of the political and economic effects of a globalization process that has its intellectual and philosophical roots in mainstream western cultures. In many parts of the Third World, western 'development' has been responsible for ecological disasters resulting from deforestation and the introduction of monocultures for the world market. COMPAS members are trying to do something about this. Their main aim is to understand and appreciate indigenous reality, concepts of life and cosmovisions, and thus not to be limited to conventional scientific and technological options. As Cosmas Gonesse points out in one of the chapters, development workers 'need to be critical of all knowledge systems and to extract what is appropriate, combining the good from various sources to create a better and more sustainable environment.'

I do agree with the authors when they say that IK is disappearing. Indeed, both natural and cultural resources are under risk of extinction in many parts of the world. For this reason, *Food for thought* should be read in particular by decision-makers and politicians. The book contributes to a paradigm for sustainable development by examining the cultural aspects of sustainability and by providing concrete examples which show that traditional knowledge can be a valuable source of new information and new insights that complement western science. For this reason the book is also recommended for professionals working in the field: agriculturalists, ecological anthropologists, ethnologists, historians, lawyers, biologists, and environmental engineers. As a teacher, I would

recommend it for use in courses of human ecology, ecological anthropology and agriculture.

(Eraldo Medeiros Costa Neto, *ethnobiology researcher, Feira de Santana State University, Brazil.* E-mail: eraldont@uefs.br <http://www.sbee.org.br>)

Jones, Peta (1997) **Donkeys for development.** 168 pp. ISBN 0-620-22177-1. ZAR15 or USD5 per copy plus shipping (ZAR10 or USD2 per copy or, if 25 copies or more are ordered, ZAR80 or USD20 per parcel). Payable by check (preferred), money order or bank deposit to SA account FNB 260149 60286591554. Published by: Animal Traction Network For Eastern and Southern Africa (ATNESA) and Institute for Agricultural Engineering, Agricultural Research Council of South Africa. *Order from:* Donkey Power/Peta Jones, P.O. Box 414, Louis Trichardt, 0920 South Africa. Tel.: +27-15-5177 011.

Indigenous to north-east Africa and the Near East, donkeys are hardy animals that can withstand heat and dryness and are often the only livestock survivors of severe droughts. Donkeys thrive on poor food and can outperform cattle by as much as 120%. Donkeys plough, pull carts, carry heavy loads, help in milling and pumping, and guard sheep. Their manure contains a lot of fibre and is useful for stabilizing sandy soils. Despite these many advantages, development professionals and scientists have been slow in realizing the great economic potential of this species. The last decade, however, has witnessed a dramatic increase in interest and demand for donkeys, paralleled by a growing need for hands-on information about their use and care.

Aimed at development and extension workers and peasant farmers, this practical guide introduces the basics of keeping donkeys and working with them. Seven chapters discuss and illustrate: what it means to have donkeys, how to choose them, how they reproduce and the care they require during and after pregnancy, how to keep and feed them, how to take care of their health, what equipment is needed for putting them to work, and how to train them. The guide is written in easy English and contains 47 diagrams and 35 photos. A glossary explains selected veterinary and animal science terms, and a list of further reading shows the reader where to turn for further information.

For newcomers, the text provides a realistic picture of what it means to keep donkeys, highlighting not only the advantages but also the difficulties and problems. But people familiar with donkeys can also benefit from the guide as it comprehensively summarizes a lot of information useful under field conditions (e.g., estimating body weight and age, criteria for choosing a donkey, looking after an orphaned foal, and many instructions on how to make work

equipment). The text contains numerous practical tips which reflect the author's more than 12 years of hands-on experience. She has not only worked as a teacher and consultant on the subject of donkeys but herself lives in remote rural areas of Africa and depends on donkeys for transport and cultivation.

The guide draws on both traditional and modern knowledge. It does not necessarily label the two as such, but introduces and blends them as suits local, smallholder conditions. This makes the booklet an excellent example how traditional and modern knowledge can be combined to complement each other in practice.

The guide has one drawback: although the chapters are divided into small sections under different subheadings, it is not always easy for readers to locate the information they are looking for. There is no index and the table of contents shows only the chapter headings but not the subheadings. There is some repetition between the chapters, and information sometimes appears in unexpected places. For example, the same drawing of a hoof is presented in chapters 2 (p. 37) and 5 (p. 74). Medicinal plants used against internal parasites are listed in the section 'Keeping donkeys' under the subheading 'What can be done to keep down parasite infestation of pastures' but not among treatments under 'Veterinary considerations' (although there is a cross-reference referring to the other chapter). In short, it would make it much easier for readers if future editions would be tightened up and better structured, and if an index were added.

Nevertheless, the guide is a great introduction to donkey-keeping and a useful aid for field practitioners and trainers. (Evelyn Mathias, *Independent Consultant, Bergisch Gladbach, Germany*)

Margoluis, Richard and Nick Salafsky (1998) **Measures of success: Designing, managing, and monitoring conservation and development projects.** 363 pp. ISBN 1-55963-612-2. USD35. Island Press, 1718 Connecticut Avenue, N.W., Suite 300, Washington, DC 20009, USA. Fax: +1-202-234 1328.

(See also *IK&DM 7(1)*, p. 38, where this book was first mentioned under 'Preview: Important new books'.)

I am conducting ethnobotanical research in Southern Venezuela and, together with my husband, have been involved in applied conservation work for several years. Currently, we are advising KUYUJANI, the indigenous organization of the Caura River, on the design of their own projects for sustainable natural resource management. In the context of that work, we have found *Measures of success* to be an excellent guide to the design, management and monitoring of conservation and development projects. It is easily adaptable to projects in other fields, such as community development,

health or education. Its well structured approach combines elements from various formal approaches to planning and management (e.g., 'adaptive management', 'ZOPP method', 'results framework', 'logframe analysis') and reflects the rich personal field and office experience of the authors and their colleagues within the Biodiversity Support Program.

In this guide, projects are conceptualized as iterative cycles that require: (1) the design of a conceptual model based on local site conditions; (2) the development of a management plan: goals, objectives, activities; (3) the development of a monitoring plan; (4) the implementation of management and monitoring plans; (5) data analysis and the communication of results; and (6) the utilization of the results for purposes of adaptation and learning. Although the material presented might not be new, the merit of the book lies in the logical and friendly presentation and its accessibility for the non-academic reader. Written primarily for conservation practitioners and community stakeholders, it is richly illustrated with line-drawings of working situations. It includes data tables and flow charts, and provides a lot of detail, for example about basic field techniques from the social and natural sciences, and basic statistical analysis. It also offers tips on data presentation, and a glossary of terms that will help the reader for whom English is not the native language.

Following this guide helps practitioners to make their assumptions more explicit. This makes it easier to conceptualize and implement good projects, but most importantly, to document and evaluate their success. Aside from its main audience, the book can benefit a much wider group of readers (e.g., students, donors, government officials) thanks to its well-structured text and a page design that make it easy to read at different levels of detail. Furthermore, a list of suggested reading at the end of each chapter facilitates further research on specific steps of the project cycle. *Measures of success* mainly provides a framework for the conceptualization of new projects, but the material presented can also be helpful for the evaluation and improvement of ongoing projects.

Although indigenous knowledge is not explicitly mentioned, the guide repeatedly states the importance of having local stakeholders take part in the design and monitoring of the project, and introduces a variety of methods for doing so. For example, as part of the design of the conceptual model, it is suggested that local stakeholders be consulted regarding the threats and opportunities for conservation. The techniques of key informant interview, matrix ranking and preference ranking are introduced in this context, and participatory rapid appraisal methods are presented as possible monitoring activities.

(Dr Claudia Knab-Vispo, *Instituto de*

Investigaciones Ecologicas Orinoco-Esequibo, Fundacion La Salle de Ciencias Naturales, Tumeremo, Edo. Bolivar, Venezuela)

Pandey, Deep Narayan (1998) **Ethnoforestry: Local knowledge for sustainable forestry and livelihood security.** vii + 91 pp. ISBN 81-86231-42-0. INR295; USD35; GBP20 (shipping charges not indicated). Himanshu Publications, 4379/4-B, Prakash House, Ansari Road, Daryaganj, New Delhi-2, India. Tel.: +91-11-325 5920.

The book (text only) can also be downloaded from the Internet at <http://education.vsnl.com/deep/index.html>

The premise behind this book is that combining the forestry-related knowledge of local communities with that of scientifically trained foresters is a key to successful forestry management. The author defines ethnoforestry as the 'continued practice of creation, conservation, management and use of forest resources, through customary ways, by local communities.' He provides many examples, mainly from India, of indigenous forest- and tree-related knowledge and practices. The practices are classified according to their functions as protection ethnoforestry, plantation ethnoforestry, and production ethnoforestry. Pandey shows how these practices are often consistent with practices of modern 'scientific' forestry and how some of these practices have been adopted by foresters in various projects.

There is quite a lot of discussion in the book about the slow emergence of the field of 'ethnoforestry' and the lack of attention it has received. To some extent this emphasis is misleading. While the name 'ethnoforestry' is new, anthropology and forestry, among other disciplines, have paid considerable attention in recent years to indigenous forestry knowledge and practices, including indigenous institutions for forest management and so on. In fact, examples of such studies are cited in the book. This misleading emphasis is only a minor distraction, however. The strengths of the book lie in the wealth of examples it gives, and in the argument it presents for the relevance of indigenous knowledge and practices to collaborative forest management activities.

Deep Narayan Pandey is an Indian forester with long experience in, and intense commitment to, the implementation of people-friendly forestry and conservation projects. He currently works at the Indian Institute of Forest Management at Bhopal. His technical forestry background and field experience give strength to his advocacy of 'equity of knowledge' (meaning, essentially, that both indigenous and scientific knowledge should be taken seriously) and the relevance of ethnoforestry to 'scientific' forestry. The book will be of interest to a variety of readers with interests in forestry and development, especially (but not only)

those with a special interest in India. However, the US dollar and pound sterling prices are excessive for such a small book. Therefore it is a good initiative that the full text of the book is being made available for free on the Internet: <http://education.vsnl.com/deep/index.html>. (R.J. Fisher, Regional Community Forestry Training Center, Bangkok, Thailand. E-mail: ftcrjf@nontri.ku.ac.th)

Pasquale, S., P. Schroder and U. Schultze (eds) (1998) **Lokales Wissen für nachhaltige Entwicklung: Ein Praxisführer (Local knowledge for sustainable development: a practical guide)**. 160 pp. ISBN 3-88156-709-7. DEM19; OES139; CHF18. Verlag für Entwicklungspolitik Saarbrücken GmbH, Auf der Adt 14, D-66130, Saarbrücken, Germany. Tel.: +49-6893-986 094. Fax: +49-6893-986 095. E-mail: vfesbr@aol.com (See also *IK&DM 7(1)*, p. 38, where this book was first mentioned under 'Preview: Important new books'.)

This guide, written in the German language but with indexes in English, is based on the 1995 special edition of the periodical *Entwicklungsethnologie*, which dealt with local knowledge and development: the relevance of culturally specific knowledge for development processes. I was asked to read and comment on the guide from the point of view of my own research and practice experience. I am an anthropologist specializing in ethnomedicine in Africa, mainly with the role of spirituality in illness, medicine and healing in Tanzania.

This book's stated purpose is to encourage the use of indigenous knowledge in development projects and international cooperation by facilitating cross-cultural exchange. The ultimate aim is to help improve living conditions in Third World countries. The editors say that in both North and South, indigenous knowledge resources are still being used too little.

Although the editors' own backgrounds seem to give them a special interest in land-use issues, they deal with a broad range of subjects, including legal property rights and the role of gender. This makes the guide interesting for government officials, consultants, development workers and project leaders. It can be used for an initial orientation to nearly any topic. But for anyone seeking more specific information—on indigenous health care in a certain geographical region, for example—the guide will be disappointing. In my case, it offered only a few references pertaining to medicinal plants, traditional health care, and specific diseases. A practical guidebook like this one, but more limited in scope and more detailed, would have been more useful to me. Nonetheless the guide can be helpful to anyone who is starting to plan a project or joint research that takes a participatory approach. It will convince them of the

importance of incorporating IK resources into their project from the very beginning. (Jessica Erdsieck, International Development Research Associate at the Amsterdam Institute for Global Issues and Development (AGIDS), University of Amsterdam, the Netherlands. E-mail: j.erdsieck@frw.uva.nl. <http://www.frw.uva.nl/agids>.)

Renard, Geneviève, Andreas Neef, Klaus Becker and Matthias von Oppen (eds) (1998) **Soil fertility management in West African land use systems. Proceedings of the Regional Workshop University of Hohenheim, ICRISAT Sahelian Centre and INRAN, 4-8 March 1997, Niamey, Niger**. 600 pp. ISBN 3-8236-1272-7. DEM120; USD90. Margraf Verlag, P.O.Box 1205, D-97985 Weikersheim, Germany. Tel.: +49-7934 3071. Fax: +49-7934 8156.

This book contains a very wide-ranging collection of papers dealing with issues of soil fertility and soil management, mainly in the drier areas of West Africa. The principal chapters deal with (1) Technologies for fertility management; (2) Soil and water conservation and agroforestry; (3) Crop-livestock interaction; (4) Political and economic aspects; and (5) Farmer participation in research and development. Together with several review papers, the five keynote papers, one for each chapter, provide an effective summary of current knowledge and thinking about solutions for the increasingly alarming degradation of soils in these fragile environments. They outline the challenges to agricultural development, in particular the need for a massive application of a combination of 'ecological' and chemical methods for building and maintaining fertility. The over-riding impression left by the review papers is that it is not for lack of knowledge of physical and biological processes that the degradation of soil resources continues up to the present day.

It is therefore rather depressing to note that a large portion of the various research papers cited in the various chapters demonstrate the lack of imagination and relevance that characterizes much of current research, especially the researcher-managed variant. How many more years of controlled experiments do we need to convince ourselves that mulch reduces erosion, P enhances N utilization, crop rotation is better than mono-cropping, legumes add nitrogen to the soil, etc., etc.?

This is not to say that the farmer's perspective is missing entirely. A few studies report on indigenous practices of fertility management and soil conservation, or on ways in which farmers combine traditional strategies with introduced fertility practices (i.e. fertilizer). Others advocate a range of measures and policies to stem the ongoing decline in fertility. There are also papers dealing with on-farm research methodology, but the number of papers reporting on actual farmer-managed technology and technology

adoption does not exceed four or five, out of a total of 82. And this is despite decades of promotion of participatory on-farm research! The participants in the workshop apparently felt uneasy about this themselves. During the working group discussions which concluded the workshops, they called for much more farmer involvement in the future. But in view of what many of them have been doing up to now, this would mark quite a change.

To end on a positive note: the book does bring out very clearly the contributions and the limitations of conventional soil fertility research in West Africa. It also clearly demonstrates that it is high time for researchers to leave their ivory towers and start getting some of their findings implemented on real farms, and to lend a hand not in the capacity of all-knowing savants, but as the farmers' servants. (H.J.W. Mutsaers, consultant, Agricultural Research and Rural Development, Nedworc Foundation, Zeist, the Netherlands. E-mail: hjwmutsa@knoware.nl)

Sande, Theo van de, 'Socio-economic pitfalls of enhancing indigenous capabilities in household fermentation'. Article first published in 1997 in **Food Control** 8(5/6) pages 303-310. Now published in the **Reprint series Ministry of Foreign Affairs** as no. 24, February 1999 (with permission from Elsevier Science Ltd). Free copies can be requested from the Ministry of Foreign Affairs, SBO/OC, P.O. Box 20061, 2500 EB, The Hague, the Netherlands. Fax: +31-70-348 6253. Refer to the publication's order number: OSDR 0327/E.

Dr Theo van de Sande is a senior expert in the research and developing countries department of the Netherlands' Ministry of Foreign Affairs, where he is a specialist in biotechnology research. He has held positions at universities in Amsterdam and Twente and has conducted research on the interaction between science (especially biotechnology), politics and society.

In the article, Van de Sande says that the Green Revolution ignored the experience and knowledge of small-scale farmers. Consequently, only people in more favourable agricultural areas profited. In other areas, particularly in sub-Saharan Africa, malnourishment increased. To illustrate the point he offers two tables from FAO: 1) Trends in food production, and 2) Occurrence of malnutrition. But these date from 1985 and 1987 and 1998, respectively. A more current publication would have given the recent trends.

As a vital element in food security strategies, post-harvest fermentation technology is receiving a lot of attention, and efforts are being made to improve traditional methods. Van de Sande points out, however, that improving any technology is not only a technical issue but also a social, environmental and economic issue.

The attempt to upgrade soy fermentation in Indonesia is given as an example of the consequences of focusing only on the technical aspect. The author describes the different fermentation processes used in the production of soy sauce in China, Japan and Indonesia. Because the methods are different, the end products are different. He also provides basic information about how finance is obtained in Indonesia, and how soy sauce (kecap) is marketed. The author concludes that most of the Japanese innovations would be inappropriate in Indonesia. The small-scale production of kecap is not standardized in Indonesia and there is wide variation in the quality of the product. Certain steps in the production of kecap are still a trade secret in Indonesia. This makes it difficult to do research on the technology involved. The products are sold mainly in rural areas and are bought by people in the low-income group. The large-scale production of kecap is standardized, however. Although the taste is similar to the traditional kecap, it is of better quality. These products are sold in the urban markets and are bought by people in the high-income group.

The case illustrates the fact that problems and their solutions are rarely universal or solely technical. The author recommends the active participation of local small producers in the design and execution of research projects. He also recommends a multidisciplinary approach to research designed to upgrade food production.

The paper highlights the importance of indigenous knowledge in research and development, and makes useful reading for researchers, policy-makers and funding agents. 'Indigenous fermentation of soy sauce in Indonesia' would have been a better title, however.

(J.O. Amarteifio, Senior Lecturer, Department of Basic Sciences, Botswana College of Agriculture, Gaborone, Botswana. E-mail: jamartei@bca.bw)

Selener, D., J. Chenier and R. Zelaya (1997) **Farmer-to-farmer extension: lessons from the field**. 140 pp. ISBN 9978-04-324-1. USD15 (postage included). International Institute for Rural Reconstruction (IIRR), New York. Available in English and Spanish. Orders must be prepaid. Please send check in US dollars or European currency (equivalent to USD15) payable to IIRR, to: International Institute for Rural Reconstruction, Apartado Postal 17-08-8494, Quito, Ecuador. Fax: +593-2-443 763. E-mail: daniel@iirr.ecx.ec

With its clear writing style and careful avoidance of technical jargon, this short (140 page) book will be useful to local community and extension workers, rural development specialists and researchers alike. It is a concise and complete guide to the process and pitfalls involved in the design, organization and implementation of projects led by 'farmer promoters'—resource-poor farmers whose

primary income is from farming and who have been selected for their innovation and leadership. The publisher has kept costs down by using an attractive soft cover, by limiting the book's length, and by avoiding a need for photographic illustrations. The common trap into which some very useful books fall has thus been avoided: they become too expensive to reach the people for whom they are intended. This is not the case here. The authors and publisher are to be congratulated.

There are two main sections to the book. The first part (Chapters 1-13) provides a detailed account of different approaches and options that can be taken in 'farmer-to-farmer' research. It gives the characteristics of farmer promoters and describes the how and why of their work. This section was based on two workshops, one held in Ecuador and the other in Honduras. It is clear from the content of these chapters (on topics selected by the farmer promoters themselves for their importance) that these were real WORKshops, not 'talkshops': all chapters have detailed and useful content which clearly summarizes years of field experience.

The second part (Chapters 14-18) presents five case studies from Latin America. Although the situations in Ecuador, Mexico and Nicaragua are quite different, the case studies raise and analyze key questions. The two case studies which I found most telling were Chapter 15 (by Marcía Lopez and Abelardo Rivas) and Chapter 18 (by Luis Felipe Ulloa). The first of these, from Nicaragua, discusses a farmer-to-farmer programme of the National Union of Farmers and Livestock Producers, and describes the advantages and disadvantages of the various activities of farmer promoters. Chapter 18 carefully examines a key question: how and under what circumstances should farmer promoters be compensated for their work? This is important not only for the farmer promoters themselves, but also for development organizations concerned about the efficiency and sustainability of their programmes.

Readers will undoubtedly find two features of this book especially useful. First, boxes of text scattered throughout all the chapters summarize the positive and negative aspects of various options in farmer-to-farmer extension; and second, each chapter finishes with a list of recommendations. What I also found refreshing was the clear and open way that negative points were raised—backed up by the authority of experience and unobscured by 'political correctness'.

I reviewed this book as someone who grew up and has worked in Africa rather than in Latin America, where the workshops and case studies on which the book is based were situated. On this basis, I would suggest that many of the book's lessons have an appeal and application far wider than just Latin America. At the same

time, it is a measure of this book's strength that it recognizes the fact that: 'Even though development projects may have similar objectives, they all have differences as well. Diverse factors and components within a given project require adaptation of the farmer-to-farmer methodology. Projects differ in their policies, emphasis and strategies, and include diverse types of activities which determine whether promoters should be specialist or generalists, should work in their own or community in other communities, or should be remunerated or not. Other important aspects that should be taken into account are the geographic coverage of the project and its duration.... In summary, the project characteristics are key factors in determining the best alternatives within each component of the farmer-to-farmer methodology.' (p. 80)

(A.B. (Tony) Cunningham, Regional Co-ordinator, WWF/UNESCO/Kew People and Plants Initiative, Fremantle, Australia.

<http://www.kew.org.uk/peopleplants>)

Sissoko, Keffing (1998) **Et demain l'agriculture? Options techniques et mesures politiques pour un développement agricole durable en Afrique subsaharienne. Cas du Cercle de Koutiala en zone sud du Mali**. Documents sur la Gestion des Ressources Tropicales / Tropical Resource Management Papers No. 23. 179 pp. + 37 pp. of Annexes. ISBN 90-6754-551-1. NLG40 including fee for postage. Published by the Wageningen University and Research Centre (Wageningen UR), P.O. Box 9101, 6700 HB Wageningen, the Netherlands. Tel.: +31-317-484 293. Fax: +31-317-484 292.

This book contains the results of a doctoral thesis study by the author, who has been involved in agricultural research in Mali since 1983. The reported work is a model-based study of the technical and political requirements for sustainable agricultural production in an area in Mali that has a relatively high population density and a production system dominated by cotton. The work was carried out while and after the author worked in the well-known Production Soudano-Sahélienne (PSS) project, lastly as its national coordinator. It applies PSS-developed concepts and methodologies outside the project's immediate target zone, using a range of actual research data and estimated parameters.

The study considers sustainability from the point of view of plant nutrient balances. It defines an assumedly ideal production scenario integrating crops, livestock and forestry, and calculates the land allocation and inputs required to optimize results, satisfying a number of pre-set production goals including, of course, maintenance of the soil nutrient stock. A range of production practices observed among farmers are then compared with the ideal scenario, and the

requirements are defined for moving the existing systems closer to sustainability. These requirements range from farm-level resource allocation and the adoption of improved practices to government policy on prices, market development, extension and research.

The essential message emerging from the study is that agriculture in the area can move forward towards a highly productive and sustainable system through a combination of technical innovations and supportive policies taken by government at different levels. The author's technical conclusions will come as no surprise to most agriculturists: land use according to its suitability, integration of a forestry and animal fodder production component, intensive livestock-keeping and the use of manure, and application of improved production practices aimed at optimizing the use of resources. A major limitation of the work, which is also acknowledged by the author, is the absence of the risk factor in the analysis, which has a strong influence on farmers' decision-making.

One wonders whether the same results could not be arrived at using a much simpler analytical approach which would make the results more useful for applied research and extension. Hopefully, the author can find the opportunity to work on such an approach in the future. Also, a large part of the book discusses development-related issues of a general nature. At times this seems only to serve the purpose of attaining the required number of pages for a Ph.D. thesis. Nevertheless, the book provides useful information about production conditions in an important area of Mali, and delivers an optimistic and well-argued case regarding the potential for agricultural development and the unavoidable need for external nutrient sources.

(H.J.W. Mutsaers, consultant, Agricultural Research and Rural Development, Nedworc Foundation, Zeist, the Netherlands. E-mail: hjwmutsa@knoware.nl)

Sinith Sittirak (1998) **The daughters of development. Women in a changing environment.** 153 pp. ISBN 1-85649-588-4. GBP12.95; USD17.50. Zed Books Ltd., 7 Cynthia Street, London N1 9JF, UK. Tel.: +44-171-837 8466. Fax: +44-171-833 3960.

Sinith Sittirak is a feminist from Thailand who started to question the Western concept of development and its impact on ordinary people the moment she began to study for a master's degree in Environmental Studies at Toronto's York University. Her Canadian classmates asked her, 'What does development mean to you, Sinith?' She realized that this question was crucial, and decided to make it the core of her thesis. The book presents the main points of her thesis in six chapters, each of which answers the question what 'development' means to her.

Sittirak went through a process of discovery, of 'decolonization' as she calls it, in order to get a clearer picture of 'neo-colonization'. She writes, 'What the Thais have received from development is deforestation, polluted rivers and large numbers of poor and prostitutes.' She found that the patriarchal ideology which operates in the form of capitalism and neo-colonialism has brought irreparable damage to the relationship between life and nature, and has made the form and content of human relations sexist, classist and racist. She says that it is ironic that only after travelling 10,000 miles to study environmental subjects and learn new technical terms, did she come to understand that this 'new' knowledge had already been taught to her, at a practical level, year after year, by her mother. Sittirak concluded that her mother was suppressed, devalued and marginalized by the Thai elites' propagation of modern development. Now the elites are talking hypocritically about self-sufficiency as a virtue, whereas—according to Maria Mies, who wrote the preface to the book—development has in fact destroyed the good life for the majority, and above all for women and nature.

Sittirak is one more of the critical feminist voices from the South who no longer place their hope in the myth of development but rather in the preservation and restoration of their mothers' subsistence economies. This is why Sittirak is now travelling all over the world with her project, called *My mother: an unwritten environmental education curriculum*, in which she has documented her mother's lifestyle and eco-awareness. The exhibition includes photos plus her mother's 'recipes' for protecting and preserving nature and curing minor illnesses.

The book raises many questions. In the first place, ordinary people in 'underdeveloped' countries are not the only 'victims' of development, which in this book is a synonym for capitalist patriarchy. In the preface, Maria Mies refers to the universal impact of the development paradigm and the 'absurdity of the growth mania'. These are also evident in her mother's village in Germany, where more or less the same processes have destroyed life (indigenous knowledge and subsistence), says Mies. In the Netherlands these same processes have been described by Geert Mak in his well known novel *Hoe God verdween uit Jorwerd* (*How God disappeared from Jorwerd*), a small village in Friesland.

In Sittirak's book I missed a more hopeful, concrete and balanced analysis of the 'good' things that have emerged in the North and South in response to critical awareness of the 'bad' consequences of development. This journal is one example of the effort to rediscover and rehabilitate traditional indigenous knowledge as a basis for empowerment.

(L.Ch. Schenk-Sandbergen, Associate Professor, Anthropological / Sociological Centre, Faculty of

Political and Socio-cultural Sciences, University of Amsterdam, the Netherlands)

For more information, contact: Women and Environmental Network in Thailand (WENIT), 535/18 Jarunsanitwong Rd 39, Bangkok 10700, Thailand. Tel. / fax: +662-411 4046.

Ulluwishewa, Rohana (1997) **Searching avenues for sustainable land use: the role of indigenous knowledge between market forces and state's interventions. A case study from Sri Lanka.** Sri Lanka Studies Vol. 6. 56 pp. + 2 maps. ISBN none. CHF15. Published by, and available from: University of Zurich, Dept. of Geography, Winterthurerstr. 190, CH-8057 Zurich, Switzerland.

This book is based on in-depth study of seven villages in the dry zone of Sri Lanka. These villages use the 'cascade system', which means there is a series of linked village 'tanks' along the main axis and side valleys of a small river, each tank irrigating an area of paddy fields. Traditionally, the tank was the centre and hub of all village life, providing water for drinking, bathing and washing, fishing, filling buffalo pools, etc., as well as for the vital irrigation. The 'upland interfluves' were used mainly for chena farming (long-periodicity shifting cultivation).

The research objectives were twofold: to assess the importance and potential relevance of the indigenous knowledge underlying land use patterns that prevailed around the beginning of the century; and to identify the ecological and social consequences of subsequent changes in land use as a result of legislation, market forces and increased population.

The author presents the indigenous technical knowledge of land resources in detail. This pertains mainly to soils, water, vegetation and agricultural potential. The farmers recognized 11 types of soil and 21 types of land use. These are described and discussed in terms of their suitability, among other things.

Ulluwishewa points out that many steps in conventional land-use planning are clearly identifiable in the historical, indigenous process of selecting, allocating and managing land. To build up a village in a new area, there would have been three steps: 1) to identify village subsistence needs and the relevant land units; 2) to evaluate the land and assess its capacity using indicator plants and other indigenous technical knowledge; and 3) to allocate land on the basis of 'a mental map of land capability'.

The strength of the book lies in its descriptions of patterns of land use in the indigenous context and of the changes that took place during the British colonial period and after independence. The changes in traditional land use brought about by the Waste Lands Ordinance of 1840, the designation of Crown Lands, and the Land Development Ordinance of 1935 are all well documented. Causes of ecological deterioration are also well

Mailing Lists



Africadiv mailing list

A new mailing list called 'Africadiv' has just been launched. It was initiated by the Indigenous Knowledge and Biodiversity Working Group of the Environment Liaison Centre International (ELCI) in Nairobi, Kenya, and will be maintained in collaboration with Nuffic-CIRAN.

'Africadiv' is short for 'Africa Diversity'. The mailing list will foster discussion and help to generate knowledge regarding the sustainable use of biological diversity and indigenous knowledge in Africa. Anyone with an interest in the subject is invited to take part: natural and social scientists, representatives of governmental and non-governmental organizations, and practitioners in the field. The list will make it possible to share research materials, announce events, solicit funding, advertise job and training opportunities and relevant newsletters, and publish news related to the sustainable use and conservation of biodiversity and indigenous knowledge in Africa.

Within two weeks of the official launch, 130 people from all parts of the world had subscribed. Subscribing to the mailing list is easy, and free. Just send an e-mail message to lyris@lyris.nuffic.nl. Leave the subject blank, but write in the body of the message 'subscribe africadiv', and give your name.

If you have any questions, please contact: Ingeborg Krukkert (list manager) at krukkert@nuffic.nl

or: Ernest Rukangira (content manager) at erukangira@iconnect.co.ke.

Websites

In this feature we recommend websites that deal with the subjects treated in this issue of the Indigenous Knowledge and Development Monitor. CIRAN's information specialists have searched the Internet for relevant, useful pages. Sometimes the sites offer background information; other times the information is supplementary.

Problem-solving

There is hardly any information on the Internet about indigenous problem-solving. A place to start might be the site of Sristi, society for research and initiatives related to sustainable technologies and institutions. The society consistently takes the indigenous community as its point of departure. <http://csf.colorado.edu/sristi/index.html>

documented. These include a shorter chena fallow period, which led to soil infertility; silted up tanks, which reduced fish populations and thus biodiversity; and misappropriation and overconsumption of irrigation water. The primary socio-economic consequences were the concentration of land ownership and alienation of formerly common lands (for villagers and also for outsiders), which led to a loss of alternative sources of livelihood, reduced capacity for supporting buffalo, and tougher times for the landless and for women, who relied partly on gathering produce from the common lands.

Perhaps because this is a brief account, it suffers the weakness of merely recording patterns and changes in patterns without examining process. The author is clear that the prime determinants of change are the expansion of the market economy and the consequent devaluation of local subsistence production and variegated livelihoods. But he does not discuss the relative importance of market penetration, changes in legislation, technological developments, and population growth. The book is not very clear about what constitutes 'land use planning' so that we do not learn how village land was actually allocated for different uses. Nor do we learn about the present potential of the village institutions which were responsible for allocating land and settling land disputes. The strength of the book definitely lies in the detailed fieldwork which has enabled the author to identify and explain the indigenous systems for assigning appropriate land use to the different types of land units in Sri Lanka's dry-zone villages. This makes the conclusions adequate even though they amount basically to common-sense recommendations for using indigenous technological knowledge for the assessment of soil and land capabilities and for designing intra-village zoning controls. (Mike McCall, ITC Social Science Division, Enschede, the Netherlands. E-mail: Mccall@itc.nl)

PREVIEW: IMPORTANT NEW BOOKS

The appearance of important new publications is reported here, and the books are briefly described. We have requested review copies, which will be sent to experts for their opinions regarding the books' practical usefulness. The reviewers' comments will be published in a subsequent issue of the Indigenous Knowledge and Development Monitor.

Karl, Marilee (ed.) with Anita Anand, Floris Blankenberg, Albert van den Ham and Adrian Saldanha (1999) *Measuring the immeasurable. Planning, monitoring and evaluation of networks*. 244 pp. ISBN 81-90-1005-0-6. USD25 (plus mailing costs) for people in the North; USD20 (plus mailing costs) for Third World Individuals. Order directly from Women's Feature

Service, 1, Nizamuddin East, New Delhi 110-013, India.

E-mail: WFSdelhi@giasdl01.vsnl.net.in

The need for a book like this was first expressed at the workshop *Criteria for evaluation and monitoring of international women's networks*, held in Wassenaar (the Netherlands) in May, 1993. The participants found that the evaluation methods commonly used are often inappropriate because they were designed to measure quantitative outputs, whereas women's networks often wish to bring about qualitative changes in people's lives and society. The networks shared with each other the techniques for monitoring and evaluation which they had found useful. At the end of the workshop they resolved to further develop relevant methods. The book builds on selected case studies presented in chapters focusing on networks and networking, planning, monitoring and evaluation, and using the results of monitoring and evaluation in international networks and networking organizations.

Niamir-Fuller, Maryam (ed.) (1999) *Managing mobility in African rangelands: The legitimization of transhumance*. 240 pp. ISBN 1 85339 473 4. GBP17.95; USD29.95.

Intermediate Technology Publications, 103-105 Southampton Row, London WC1B 4HH, UK.

Tel.: +44-171-436 9761.

Fax: +44-171-436 2013.

E-mail: orders@itpubs.org.uk

The publisher informs us that this publication shows how land tenure laws, decentralization policies, institutional capacity building, common property management, conflict resolution and participatory development can be made more responsive to the needs of those practising transhumance today, or pastoralists, for ecologically and economically sustainable development in arid Africa. The case studies focus on four key constraints to managed mobility: appropriate institutions at the local level; land use; land tenure and appropriate legislation; and conflict resolution.

Although the case studies are from Africa, the issues and conclusions are just as relevant to pastoralism and common property management in other continents.

Dr Maryam Niamir-Fuller is a member of CIKARD, and adds: 'This book looks at how a traditional system of raising livestock, i.e., transhumance, that has been neglected and even deliberately destroyed in the past, is now seen to be not only ecologically friendly but even economically viable. The question remains: how do we reconcile existing land tenure and institutional arrangements that are geared to a sedentary, agricultural form of production, to the need of mobility and transhumance.'

In an earlier volume of the Monitor, problem-solving was mentioned in the context of a game. The article was called 'Indigenous problem-solving and Western methodology. The case of Bao.' In Zanzibar, masters of the game known as Bao prove that conventional education is not essential for becoming a master. It turns out that the memory and problem-solving skills required for Bao are entirely different from methods of problem-solving as taught in conventional education systems. These make Bao masters extraordinary players, but more than this, the game gives them subtle methods for dealing with the sort of rapidly changing situations that characterize the game of Bao.
<http://www.nuffic.nl/ciran/ikdm/4-3/articles/voogt.html>

Post-harvesting practices

Two earlier articles in the Monitor dealt with post-harvest systems:

- 'An indigenous post-harvest technology' presents the objectives, methodology and results of a research project by the National Academy of Agricultural Research Management in India. The project examined how neem leaves are used in storage bags to prevent damage to grains by pests.

<http://www.nuffic.nl/ciran/ikdm/3-2/articles/samanta.html>

- 'Indigenous post-harvest knowledge in an Egyptian oasis' is an article on a new approach to pest management in Mut (El Dakhla), in the Western desert of Egypt, where pesticides have been distributed free in order to encourage their adoption in place of indigenous practices. According to some farmers, this has made pest problems worse and created environmental problems.

<http://www.nuffic.nl/ciran/ikdm/2-1/articles/parrish.html>

Via Eldis, the gateway to development information

(<http://www.ids.ac.uk/eldis/eldis.html>), we have found two interesting sites:

- A full-text document entitled Gender-orientation in the post-harvest sector. Pointers for identifying gender-specific aspects in the post-harvest sector, by Doris Günther in collaboration with Elke Zimprich, GTZ, 1998.

<http://www.fao.org/inpho/vlibrary/gtzhhtml/x0285e/x0285e00.htm>

- Information Network on Post-Harvest Operations, a FAO databank project of the Post-Harvest Management Group, AGSI. The project's aim is to support the collection, collation, development and dissemination of useful information on proven technologies and products in post-harvest systems. The website offers the full text of training and technical publications, country profiles, and crop profiles. It is the joint effort of FAO, CIRAD, and GTZ.

<http://www.fao.org/inpho/index-e.htm>

Palm oil production

Malaysian Palm Oil Promotion Council. The name says it already. The Malaysian palm oil industry is committed to making Malaysian palm oil the leading vegetable oil in the world, and Malaysia the focal point of the international market for oils and fats. Despite the hype, all kinds of useful facts about palm oil are presented: its nutritional value, history, plant sources, etc.

<http://www.mpopc.org.my>

An earlier article in the Monitor, 'Palmeraie jardin as a sustainable alternative for oil palm production', might be of specific interest because of the photo essay illustrating how palm oil is processed in Benin. The traditional agro-forestry system of Porto Novo in Southeastern Benin, which is known as 'palmeraie jardin' (oil palm garden), is described and analyzed. The author suggests that this oil palm management system, if adapted, could be a sustainable alternative to the present systems of oil palm management.

<http://www.nuffic.nl/ciran/ikdm/7-1/segalla.html>

Kampala Declaration

The text of this document can be found on the World Bank's IK Initiative website under News

<http://www.worldbank.org/afr/ik/kdeclar.htm>

The Kampala Declaration on indigenous knowledge for sustainable development

See the guest column on the back cover

Preamble

As we approach the third millennium there is a growing global recognition of the role indigenous knowledge will play in consonance with modern scientific and technological intervention in social and economic development and cultural and political transformation. There is further recognition of the important role of local communities in contributing their indigenous knowledge systems to enhance the sustainability of development programmes.

This declaration is the result of the national workshop on *Development of a national strategy and framework of action for the sustainable application of indigenous knowledge for development* which was held at Kampala, Uganda, 8-9 December 1999. The workshop, organized by the Uganda National Council for Science and Technology, was opened by Honourable Gabriel Opio, Minister of State for Finance, Planning and Economic Development, and was attended by over sixty delegates from the public and private sectors, non-governmental organizations, community-based organizations and the civil society dedicated to the promotion of indigenous knowledge in Uganda. At the invitation of the Uganda National Council for Science and Technology on behalf of the Government of Uganda, officials from the World Bank attended the workshop.

Now, Therefore,

Realizing that indigenous knowledge is a powerful resource that enables local communities to improve and sustain their lives and that there is a need for a new vision to promote the indigenous knowledge systems of local communities to improve their social economic status;

Inspired by the vision and strategy that seeks to add value to indigenous knowledge and to apply it together with modern science and technology for the provision of goods and services to society;

Sharing the belief that application of indigenous knowledge in a rational manner in the development process will contribute to better life, job creation, poverty reduction, conservation of biodiversity and improvement of quality of life especially of the poor;

We the participants at the national workshop on Development of a national strategy for the sustainable use and application of indigenous knowledge for development:

Encourage policy makers, planners, scientists, economists, national and international development institutions as well as the entire civil society and resource managers to understand and internalize the increasing value of indigenous knowledge and to promote its application as a key instrument for the empowerment of local communities.

Urge the Government, scientists, industry systems and institutions to refine and adopt the proposed draft national strategy for sustainable application of IK for development.

Urge the Government, national and international development agencies and non-governmental organizations to accord high priority and high level of support to the national IK development strategy as a means of increasing opportunities sustainable solutions for socio-economic development.

Recommend that the Government incorporate the key elements of the proposed draft national IK development strategy in its Comprehensive Development Framework and provide adequate budgetary provision for its implementation.

We append this day, the 9th December 1999, our names below in attestation of this declaration to be known as *the Kampala Declaration on indigenous knowledge for sustainable development*.

Editorial Board

Mr Guus W. von Liebenstein
Nuffic-CIRAN
P.O. Box 29777
2502 LT The Hague
The Netherlands
Tel.: +31-70-4260 320.
Fax: +31-70-4260 329.

Dr Claude G. Mararike
University of Zimbabwe
Department of Sociology
Harare, Zimbabwe
Tel : +263-4-4963 49.
Fax: +263-4-333 407.
E-mail: mararike@socio.uz.zw

Dr Landon B. Myer
South African Medical Research Council
CERSA-Hlabisa
P.O. Box 198
3935 Mtubatuba
South Africa
Tel.: +27-35-550 0158.
Fax: +27-35-550 1674.
E-mail: lmyer@beattie.uct.ac.za

Dr Consuelo Quiroz
For the address,
see 'VERSIK', p. 25

Dr L. Jan Slikkerveer
For the address,
see 'LEAD', p. 24

Dr Norma Wolff
For the address,
see 'CIKARD', p. 25

Dr Ning Wu
Center for Development
Studies (ZELF)
Free University Berlin
Malteserstr. 74-100, Haus K
12149 Berlin, Germany
Tel.: +49-30-7792 235.
Fax: +49-30-7670 6445.
E-mail: wuning@geog.fu-berlin.de

Dr Mohamed I. Zuberi
Department of Environmental Science
Gono Bishwabidyalay
P.O. Mirzanager, Dhaka 1344
Bangladesh
E-mail: zuberi@bd.drik.net

Indigenous knowledge for sustainable development: National Strategy and Framework of Action

by Zerubabel Mijumbi Nyiira



Dr Z.M. Nyiira is a biologist and researcher in insect science. He is the Executive Secretary of the Uganda National Council for Science and Technology (UNCST) and National Coordinator for the Acacia National Programme. He is also the Coordinator of the Programme on the Development of Indigenous Knowledge for Sustainable Development and Chairman of the Committee on Natural Resources, Science and Technology of the United Nations Economic Commission for Africa (UN-ECA).

On 8-9 December 1999, a workshop was held in Kampala, Uganda to formulate a national strategy and framework of action for the sustainable application of indigenous knowledge for development. The delegates represented the public sector, NGOs, community-based organizations, and the scientific community. After two days of deliberation, the delegates finalized the text of the strategy document.

The strategy developed for Uganda is aimed at empowering local communities to utilize, exchange, develop, and protect indigenous knowledge (IK) and to promote its application within the development process. It encompasses the establishment of a system of national and international coordination and cooperation, and the design of mechanisms to promote the use of IK in development.

One of the main objectives of the national strategy is the creation of an institutional framework for development. As stakeholders, the various national and international institutions will forge collaborative partnerships and develop mechanisms for the use of IK for socioeconomic development.

The promotion of traditional and local knowledge has important policy implications. For this reason, the workshop devoted special consideration to the importance to such issues as national legislation designed to preserve and disseminate indigenous knowledge; the reinforcement of the human resource capacity needed to develop IK; and the drafting of an institutional approach to national IK development.

The Uganda National Council for Science and Technology, as lead agent, was entrusted with follow-up action plans. One of the most significant steps taken up to now was the creation of a high-level inter-institutional Steering Committee to assist in identifying and formulating activities, building consensus, and coordinating fund-raising efforts.

With regard to funding, the national strategy will focus on the initiation and implementation of programmes and activities. The major funding mechanisms include mobilizing national funds for collaborative programmes, encouraging co-sponsorship by donor agencies (through co-funding or special grants projects), establishing trust funds, and promoting private-sector partnerships. Institutions such as the National Foundation for Research and Development (NFRD) have a global mandate to promote the advancement of scientific knowledge, and are already actively seeking funding for key programmes covered by national IK strategy. One such programme area is traditional knowledge and biodiversity conservation.

The vision, the national strategy, and the practical framework of action designed to promote the sustainable use of indigenous knowledge for development in Uganda are set out in the Kampala Declaration on indigenous knowledge for sustainable development. This declaration, which is reprinted on the inside back cover of this issue of the Monitor, reflects the importance which the workshop delegates attach to indigenous knowledge for the social, cultural and economic development of local communities.

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