

Field Manual: Participatory Technology Development (PTD)

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Field Manual

Participatory Technology Development (PTD)

Linking Indigenous Knowledge and Biodiversity for
Sustainable Livelihoods

by

Maruja Salas, Xu Jianchu, and Timmi Tillmann



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Edited by: Dr. Stephen L. Mikesell

With contributions from: Mr. Wang Jianhua, Kunming Institute of Botany (KIB), Mr. Andreas Wilkes, Center for Biodiversity and Indigenous Knowledge (CBIK), Ms. Therese Grinter, Australia Volunteer International (AVI).

Website compilation: Dr. Stephen L. Mikesell

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Introduction

This field manual on *Participatory Technology Development: Linking Indigenous Knowledge and Biodiversity for Sustainable Livelihoods* has been written to aid field practices within ethnic communities in Southeast Asia and Southwest China by providing training materials for capacity building of community facilitators, researchers and technicians. It is based on adaptation of the Participatory Technology Development (PTD) approach in a learning process undertaken in eight villages in Xishuangbanna, a tropical rain forest area of Yunnan populated by several ethnic minorities whose livelihoods are undergoing externally driven changes. PTD aims to strategically enhance indigenous knowledge as a means of generating indigenous innovations and to support indigenous innovators in their sociocultural and bio-physical contexts.

The institutional context of the PTD experience related in this manual lies in GTZ's engagement, in 1999, of staff members from the Kunming-based Center for Biodiversity and Indigenous Knowledge (CBIK) to reinforce its partner-oriented approach in support of farmer-based innovations in its project "Protection of the Tropical Forests." Following several months of coordination with project staff and villagers, a ten-day workshop was organized in November 1999 at the Xishuangbanna Tropical Botanic Garden in Menglun, Mengla County. The Botanic Garden was an ideal setting in terms of its proximity to the villages, farmer-oriented work, and positive learning atmosphere.

The Kunming-based Center for Biodiversity and Indigenous Knowledge (CBIK) is dedicated to promoting indigenous knowledge and ethnic cultures for biodiversity conservation in Yunnan and Southwest China. Thereby CBIK will provide a role for the capacity building of staff, researchers and community facilitators from different partner institutions in Southwest China.

The training and application of PTD in Menglun marked the beginning of new ways of interaction between practitioners and local people. It focused on the successes of farmers' innovative practices that have gained outstanding results through many generations. The innovations concern accumulated knowledge of tree and crop varieties as well as animal species, or biota and non-biota elements of the local environment.

This manual adds a special focus to the existing PTD literature by prioritizing the

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potential of indigenous people's knowledge as a means for improving rural livelihoods in Southwest China. It provides practical tools and methods to support the implementation of the Convention on Biodiversity and its regional counterpart in the Yunnan Initiative (see Chapter 2, Section 8) by supporting indigenous knowledge. It favours respect of ethnic minority's rights and cultures, because this respect is not only a part of the autonomy policy of the Chinese government, but it is also a valid means of conserving biodiversity beyond the technocratic approach of *in-situ* conservation without people.

Experiences are soon forgotten if they are not utilized or documented. This handbook recalls step by step the PTD process of organization and the procedures required to carry out and motivate development institutions to interact creatively for the improvement of the livelihoods of local farmers and ethnic minorities based on their own knowledge and decisions.

We encourage feedback, by either sending your comments and suggestions or providing a case study from your own experience that could be included in the second edition or be published as a separate volume.

Maruja Salas, Xu Jianchu, Timmi Tillmann
Heilongtan—Black Dragon Pool, July 2002

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HOW TO READ AND USE THIS FIELD MANUAL

This manual is divided into four sections. The first consists of two chapters which introduce the PTD approach and the basic concepts of PTD. We describe our understanding of participation, technology and the nature of indigenous knowledge in the context of Southwest China.

The second part deals with methods and tools of PTD. It highlights the ethics and rules for its application in ethnic rural areas of Southwest China, giving examples from the field. We also prioritize the dynamics of PTD as a process of steps and provide tips for teamwork and the work plan for the team in the field.

The third part explains the role of indigenous specialists, the local innovators, and the resulting action plans for the local indigenous experimentation. Examples from Lahu, Yao, Jinuo and Akha communities are included to illustrate the methodology.

The fourth part summarizes the principles and mechanisms of Participatory Monitoring and Evaluation (PM&E) for PTD and provides an introduction to the learning process using a training workshop framework. One can judge the requirements and means for training technical staff and villagers in PTD.

Following a final outlook on the perspectives of PTD in ethnic communities of SW-China is a short bibliography and listing of web-resources for further readings and learning.

Although each part stands alone, it is wise to first understand the concepts and then apply tools and methods in a process of joint learning and experimentation in the field. The proposed methods and tools have evolved out of practitioners' use of PTD, and they have been field tested with farmers from various ethnic communities. They constitute a useful basis for further development of new or modified tools. The innovative character of PTD requires a constant process of feedback from the field. You are invited to join this creative experience of Participatory Technology Development with indigenous peoples.

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ACRONYMS

CBD	Convention on Biological Diversity
CBIK	Center for Biodiversity and Indigenous Knowledge
HYV	High Yielding Varieties
IK	Indigenous Knowledge
IP	Intellectual Property
IPR	Intellectual Property Rights
NGO	Non-government organization
NRM	Natural Resources Management
NTFP	Non-timber forest product
PM&E	Participatory Monitoring and Evaluation
PRA	Participatory Rural Assessment
PTD	Participatory Technology Development
SK	Scientific Knowledge
SWOT	Strength, weakness, opportunity, and threat
TOT	Top-down transfer of technology

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Chapter 1: What is PTD?

- 1. Why Use PTD?**
- 2. What is PTD?**
- 3. Characteristics of PTD**
- 4. Essential Differences between Conventional
Top-Down Approaches**
- 5. History of PTD**

1. WHY USE PTD?

Generations of scientists and practitioners in rural development are concerned with the serious limitations of conventional research and extension approaches linked to the industrialized agricultural systems of Western societies, known also as top-down transfer of technology (TOT).

These limitations include:

- Detrimental impacts on the environment, and contamination of soil, water, air and food due to use of chemicals and declining fertility
- Decreasing biodiversity due to the impositions of hybrid and genetically modified seeds for cash cropping which are reducing the *in situ* stock of land races and reduction of natural habitat containing wild ancestral stocks of domesticated species
- The growing dependency of farmers upon external agro-technologies and agro-technicians, reducing their confidence in their own skills and abilities to manage their resources
- Reduction of farmers into passive users of solutions who are not consulted over application of technologies to local conditions due to the imperative character of the technology transfer approaches

In reaction to the top-down approach, several circles of scientists and practitioners who have come to recognize their position as “outsiders” to rural life are assuming the following values:

- Emphasis of creative interactions within rural communities so that traditional, indigenous, local, or popular knowledge and experiences become the driving force of development
- Acknowledgment that their own knowledge is a product of research centers, universities and development agencies—known as technical, scientific or modern knowledge and experiences—and thus that their knowledge assumes very different contexts, values and conditions from those of farmers
- Enhancement of dialogue between the two different knowledge systems, those of “outsiders” and “locals,” in order to find joint solutions to rural issues while taking full advantage of local resources (natural, social or cultural).

An alternative approach is **Participatory Technology Development**. Its elements can be briefly explained as:

- Participatory:** involving and therefore empowering local people
- Technology:** based on local people's knowledge and practical methods of experimentation
- Development:** people-centered sustainable agricultural development based on technological generation from within

2. WHAT IS PTD?

PTD is a long-term interaction between outsiders and local people, with the aim of generating innovations based on indigenous knowledge and cultures to develop sustainable livelihood systems. It involves and links the power and capacities of agricultural research with the interests and knowledge of local communities. More broadly, PTD deals with natural resources management by strengthening the local indigenous specialists and their communities to carry out experiments in becoming more sustainable and self-reliant through drawing on their local resources.

Since PTD is closely related to community development, the role of outsiders consists in facilitating self-learning processes and serving as technicians and managers of development institutions together with local people. These outsiders also facilitate the organization of a network of village specialists to intensify communication over local innovations and encourage their persistence through ongoing experimentation in self-sustained agricultural innovations and local resource management.

3. CHARACTERISTICS OF PTD

PTD is an intercultural dialogue process with multiple levels of complexity:

1. Human interaction to creatively link the knowledge of scientists and farmers in order to overcome the limitations of cultural or technical biases
2. Skillful application of participatory methods to involve farmers as equally valuable agents in the generation of ideas and new technologies

3. Technology generation dealing with practical solutions that rely on local resources and indigenous knowledge and practices
4. A shared vision of development that accomplishes values which are environmentally sound and culturally embedded and sustainable, and which enhance biodiversity

4. ESSENTIAL DIFFERENCES BETWEEN PTD AND CONVENTIONAL TOP-DOWN APPROACHES

	TOT Approach	PTD-Alternative Approach
Why?	Generalizes predetermined solutions across wide areas, beyond the farming system.	Gives more attention to local validity of farmers' solutions to empower local farmers' knowledge.
Who?	The "experts" are based in their agencies or offices. Their professional status keeps them away from fieldwork and contact with farmers. A sociocultural gap separates them from local people. Their reports target the scientific community.	Outsiders such as research scientists and extension staff, as well as local leaders and farmers, work in mutual respect for rural life. They are willing to reflect about their field activities and share them as meaningful PTD experiences through several channels and addressing different audiences.
What?	Each expert looks through the lens of his or her own disciplinary diagnosis, informed mainly by laboratories and experimental stations.	Outsiders support or facilitate local people to identify their own problems, needs and opportunities.
How?	Experts send students or young researchers to collect quantitative data from the field or experimental stations using surveys and pre-structured questionnaires. They integrate and apply information relying only on their "expertise."	Outsiders learn from local knowledge, experiences and practices. Their professional skills rely on a range of participatory methods to collect qualitative data (for example, semi-structured interviews, mapping, diagrams, matrixes) for generating reliable results among farmers. Outsiders organize a favorable setting for dialogue involving many different partners.
When?	According to office project planning.	A long-term interaction, at frequent intervals, following a project cycle and process.

5. HISTORY OF PTD

Centers of Agricultural Research and			
Dates	Knowledge	Methods	Results
1970s	Station-based research	Single commodities Market commodities High-yielding varieties Extension services organized in terms of scientific disciplines	Negative environmental effects Technology not adapted to local conditions Farmers knowledge and livelihood neglected
1980s	Farming system research	Interaction of farms, how they operate Farm-based trails Discovery of “spontaneous” farmer innovations	Gender bias in which only men are accounted as household heads Rain-fed and marginal areas neglected Low degree of farmer participation
1990s	PTD: Based on farmer knowledge	Dialogue between outsider’s knowledge and farmers’ knowledge Local situation of farmers and their knowledge	Solutions locally generated Farmers able to create their own innovations Benefit to local livelihood systems

FURTHER READINGS

Further readings on the differences between TOT and PTD as well as the history of PTD can be found in:

- Rhoades, Robert E. 1984. *Breaking New Ground: Agricultural Anthropology*. Lima: CIP.
- Chambers, Robert, and Janice Jiggins. 1986. *Agricultural Research for Resource-Poor Farmers: A Parsimonious Paradigm*. Discussion Paper 220, Brighton: IDS, University of Sussex.
- Haverkort, Betrus., W. Hiemstra, Coen Reijntjes, and S. Essers. 1988. Strengthening Farmers’ Capacity for Technology Development. *ILEIA Newsletter* 4 (3): 3–7.

Chapter 2: Basic Concepts of PTD

- 1. What Do We Mean by Participation in PTD?**
- 2. The Meaning of Technology in PTD**
- 3. The Nature of Indigenous Knowledge**
- 4. What are the Main Characteristics of Indigenous Knowledge and its Differences from Scientific Knowledge?**
- 5. Main Concepts for the Understanding of Indigenous Knowledge**
- 6. Diverse Systems**
- 7. How to Understand Indigenous Knowledge for PTD Action**
- 8. Indigenous Knowledge and Biodiversity**
- 9. Development in PTD**

1. WHAT DO WE MEAN BY PARTICIPATION IN PTD?

There are many ways to understand and practice participation of local people (beneficiaries) in development work, but at the same time there is terrible confusion. Too often participation is used manipulatively as a means to get local peoples to work to fulfill goals and quotas of outside organizations rather than taking the time to work with them to understand their situation, values, and the complex character of their needs. Some development practitioners (outsiders) label passive attendance as “people’s participation.” Other practitioners give orders to the farmers to plant trees, with or without payment, and declare it “people’s participation.” There are innumerable examples about how participation is misunderstood, distorted and misused in practice.

Some aspects are fundamental to the participatory processes:

- Consultation and access to information for the local people about the intentions of outsiders in a village or region regarding the exchange of knowledge to foster innovations.
- Freedom of choice for local people to engage in a process of innovation.
- Empowerment through redistribution of power on the basis of equity and compatibility. Outsiders and local farmers interact according to their capacity to experiment and innovate, recognizing various expectations, needs and responsibilities.
- Mutual trust and respect resulting in a process in which both parties feel encouraged to continue a relationship and maintain a long-term process of community development on the basis of self-reliant resource management.
- Distribution of benefits to partners equally. Local people should be able to perceive how this experience will improve and sustain their livelihoods.
- Adaptability and flexibility of outside institutions to changing and sometimes unforeseen circumstances.

PROJECT CYCLE MANAGEMENT AND PARTICIPATION

Participation at project level is an effective communication and decision-making process for building ongoing partnerships with local people during all phases of a project cycle:

Participation in Planning

The best way to plan with the people is to look at situations through their own eyes and perceptions. Through the use of PRA-tools, we can establish not only the starting

point but also visions of development based on local criteria. By this process, people are not made into objects of our development ideas. Rather, they take ownership, mobilize their ideas and forces, and decide on the content and method of the project. Thereby they are positioned to determine our action and facilitation tasks.

Participation in Implementation

Planned by and with the people, implementation also is in the hands of the people. They control and monitor the activities and request external support as needed.

Participatory Evaluation

Evaluation in this context means to know about what progress is being made and the difficulties encountered in the original plan and to decide jointly what to do next. Evaluation includes not only the field actions but also the attitudes and proceedings of the facilitation team.

In all three instances, participation is both a means and an aim. It is a means because the people take ownership of their own development project and activity, and it is an aim because by getting organized the people enhance their capacity to manage their own livelihoods.

Partnership means a mutually agreed arrangement between public, private, or non-government organizations and local people to achieve jointly determined goals or objectives for the benefit of the environment and society.

WHY IS PARTICIPATION SO IMPORTANT?

Development efforts in the last thirty years provide a number of lessons on the significance of participation:

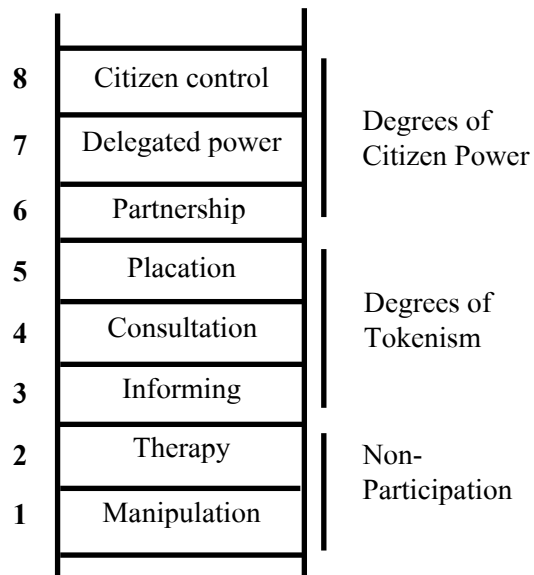
- Involvement of people living in a locality or region in development projects is a major guarantee that the interests and needs of local people will be defined more effectively.
- Local people generate information that will create a common understanding which is no longer “only scientific or only local” but the basis for original, self beneficial solutions.
- The solutions will be socially and culturally acceptable.
- Participation creates a sense of ownership and local people will implement activities on a basis of self reliance.
- Participation creates a collective self-esteem leading to revitalization of local experiences. Local people will feel empowered to manage their resources with

greater awareness of the value of sustainability for future generations.

LOOKING AT PARTICIPATION IN A DIFFERENTIATED WAY

Participation has been interpreted in many ways, but when identified in terms of equitable distribution of power between partners, attempts to implement participation can be differentiated into various degrees of distribution of power. Arnstein's eight rungs on the "ladder of citizen participation" distinguish concepts that consider the degree of power that is shared¹ and highlight how many examples that are often put forward as participation may only incompletely involve people.

1. Manipulation: Suits only the purposes of the power holders, is non-participative, and the aim is to make the participants go along with the plan.
2. Therapy: Again non-participative, power holders educate or cure others who have no choice, and as with manipulation, the proposed plan is best.
3. Informing: Though often a genuine first step to participation, power holders give facts or data to the population, but through a one-way flow of information without feedback.
4. Consultation: Power holders listen to the local population using surveys, public meetings and inquiries, but as the population's is excluded from the decision-making process, it tends to provide little more than window dressing.
5. Placating: Citizens are allowed to advise or plan, often through co-optation of local figures onto committees, but powerholders retain right to judge legitimacy or feasibility of advice.
6. Partnership: Power is redistributed through negotiation between citizens and power holders, and planning and decision-making are shared, for example, in joint committees.



¹Sherry R. Arnstein, "A Ladder of Citizen Participation," *Journal of the American Planning Association*, Vol. 35, No. 4, July 1969, pp. 216–224. See also S. Davidson's further development of the concept in terms of a "wheel of participation" in "Spinning the Wheel," *Planning*, April 3, 1998, pp. 14–15.

7. Delegated power: Power holders involve local people in management of selected parts of projects. Holding a clear majority of seats on committees with delegated powers to make decisions, citizens are in a position to demand accountability.
8. Empowerment or citizen control: Power is shared on the basis of free partnerships and local decisions to get involved in actions with an active engagement in getting information and developing understanding about the benefits, responsibilities, and interests involved. Have nots handle the entire job of planning and undertaking the program, for example, in community organizations which have no intermediary between the community and the source of funds. The sharing of power raises the issue of accountability, in the sense of to *whom* a group with power can give reasons for development action.

These categories were designed from the experience of urban planning in the United States. From our experience working in PTD in Southeast Asia, we can put forward a corresponding series of categories reflecting the degree that local communities or stakeholders are involved in development projects.

1. Passive participation
2. Incentive participation
3. Participation as an information provider
4. Consultative participation
5. Interactive participation and shared decision
6. Active participation leading to self-determination

2. THE MEANING OF TECHNOLOGY IN PTD

Technology has to do with the ways and means with which humans apply themselves to their environment to obtain sustenance and create a way of life. Each culture has its own particular means developed through long engagement with the local social and natural environments, and until the mid-twentieth century large numbers of indigenous peoples relied on their own locally developed technologies and knowledge of how to make and use this technology to sustain themselves and their communities.

In 1949, North American President Harry Truman declared the end of the colonial era in the west and announced a world-wide plan of economic growth. Increase of production and prosperity for the “underdeveloped” population was promised with the help of scientific knowledge and technology. Since then, science and technology have

been considered as the key tools for development and modernization, while active efforts were taken to discredit and replace local forms of knowledge and technology as being inefficient and irrational, with little attempt to understand them except in the form of objective ethnographic data or museum artifacts, rather than practical knowledge that people could build upon or use to inform the scientific viewpoint. This even though indigenous knowledge had sustained communities and their rich, complex cultures over many centuries, if not millennia.

Fifty years later, conventional technology, that is, the application of scientific knowledge, has failed to accomplish the dream of prosperity for all. On the contrary, the introduction of technology in local areas is disrupting long evolved, complex systems of relations, leading to cultural decline, environmental degradation and widespread modern poverty as rural people rely less and less on their own intellectual and material resources and depend increasingly on externally driven technological solutions. The introduced technology furthermore brings its own social relations which open the way for exploitation of local communities and environments by outsiders. A critical point here is the acceptance of the cause of poverty as due to a lack of modern technology. Local people begin to believe that only through modern technologies will they be able to produce more and achieve better living conditions. Instead of cultivating diversity, they get involved in an endless spiral of seeking higher yields through application of more chemical fertilizers, insecticides, and Higher Yielding Varieties (HYV), as if their plots have no production limits and the capacities of nature are inexhaustible.

THE NATURE OF KNOWLEDGE

Knowledge is a process of social construction of ideas about the external world that guide human action.

Knowledge is:

- **Process:** because it can never be completed nor is it final
- **Social construction:** is based in the social perception of reality, encoded in cultural categories communicated in a language shared by a group of people, and reproduced by knowers or an 'epistemic' community
- **External world:** is what is outside the individual and social heads

- ***Ideas:*** are in the “heads” of individuals and in social “heads”
- ***Guide to human action:*** although the essence of knowledge is ideas in “heads,” it has a practical character that involves group efforts of cooperation

3. THE NATURE OF INDIGENOUS KNOWLEDGE

INTRODUCTION TO INDIGENOUS KNOWLEDGE

In PTD, technology is understood as the application of knowledge in a broader sense. Specifically, since PTD focuses on rural society, the local, indigenous knowledge is its main interest. The next section elaborates on indigenous knowledge as the socially constructed idealistic process giving rise to indigenous technologies.

Indigenous knowledge is a concept that has several definitions in the context of contemporary theory and praxis related to development and conservation.

If we look at the concept from a historical perspective, we are confronted with several questions: What is knowledge? What are the main characteristics of indigenous knowledge? What are the differences between scientific knowledge and indigenous knowledge?

What is Knowledge?

Knowledge is “between your two ears”

Knowledge comes “from the heart”

Knowledge is a social construction

Knowledge is power

KNOWLEDGE IS “BETWEEN YOUR EARS”

The first definition emphasizes the, mental, ideational, intellectual, and cognitive nature of knowledge. When we talk about knowledge, we are referring to ideas, perceptions and memories that a person captures about reality. There is no knowl-

edge without persons who mentally perceive and interpret reality. Therefore we can definitively say there is no knowledge in the books. In order to study indigenous knowledge, we must interact with persons, face to face, and listen to how they express the contents of their heads. (*Source: Roeling*)

KNOWLEDGE COMES “FROM THE HEART”

This definition refers to the fact that feelings shape ideas, perceptions and memories. A good example is the concept of emotional intelligence, which is the newest finding of social psychology and learning theory. It explains that what we know is a capacity from within, from our sensitivity to unravel problems emotionally and cognitively.

KNOWLEDGE IS A SOCIAL CONSTRUCTION

Although knowledge is a subjective understanding of the world (each person is able to perceive, think and feel ideas and memories), no one person alone possesses the complete meaning of one topic. Knowledge is shared by an “epistemic community,” that is, each one of the social group knows something. This has an important research consequence that, in order to study indigenous knowledge, we have to recognize the existence of different members of a social or ethnic group who give different “versions” to a topic. Our task is to identify how these versions are generated, transmitted and used. (*Source: [Long and Long, 1992](#)*)

KNOWLEDGE IS POWER

This definition refers to the fact that the ultimate goal of knowledge is to orient human action. Each person behaves relying on some ideas, values, perceptions and concepts that he or she selects. Another related issue to the power dimension of knowledge is the mobilizing effect of ideas in society. Think about what happens within groups when they agree about a revolution, peace, mediation, etc. and this is put into action.

SUMMARY

Knowledge is a subjective understanding, occurring in our minds. It involves ideas, perceptions, values, and feelings. The meaning of knowledge is socially constructed, and its ultimate goal serves to orient and guide human action.

4. WHAT ARE THE MAIN CHARACTERISTICS OF INDIGENOUS KNOWLEDGE AND ITS DIFFERENCES FROM SCIENTIFIC KNOWLEDGE?

<u>Indigenous Knowledge</u>	<u>Scientific Knowledge</u>
IK is locally rooted in the culture of a particular place. Since it is based on the experiences of living peoples, it is always changing, being produced or generated, as well as reproduced, discovered, lost, or recreated. IK is context-specific, therefore the efforts to transfer that knowledge to other places would mean dislocating it.	SK aspires to be universally valid a product of a culturally de-contextualized intellectual effort. It is generated in institutions like universities, international centers and is shared by the experience of researchers, professors, and academicians.
IK is orally transmitted, with the help of collective memory, encoded in stories, myths, legends, songs, and systems of classification of resources that are decoded by the members of the same “epistemic community.” Since IK is empirical and hypothetical, it is learned by imitation and demonstration. Therefore, documenting IK should be done in the codes and classificatory categories of the local language and culture and emphasizing the construction aspects.	SK is recorded in books and articles. Each discipline develops its own theories, models and specialized languages. For example, botanists and social scientists have their own terminologies for the phenomena they focus on and they use for the transmission of contents to students or other scientists. SK tends to be theoretical, abstract and esoteric.
IK uses metaphorical devices and repetition to assist in the retention of ideas. But at the same time new knowledge is added without conflicting with the basic ideas. When we study IK and use graphic representations or oral history to collect IK, it needs to be explained by the actors themselves, otherwise we misinterpret it.	SK aims for objectivity, in which judgment is based on observable phenomena and uninfluenced by emotions or personal prejudices of the observer. The ideas are demonstrated through logical argumentation and very often the paradigms change, for example, of conservationists versus developmentalists.
IK is socially differentiated. There is IK shared by the majority of the community, for example, the main periods to transplant the rice. This is common knowledge. There is a type of knowledge that is held by persons with very special experiences, for example women knowledgeable in NTFPs, or men who can determine the proper sites for constructing a house. In terms of knowledge	SK, as a social product, is also socially differentiated, but in other categories: for example you have at the universities, undergraduate students, post-graduate students and professors with long history of teaching. In a research institute one can find junior staff, senior staff, and experts who have a very deep knowledge about a disciplinary field. But no matter how deep

(Continued)

Scientific Knowledge

generation there are significant differences in knowledge: old people recall some practices that young people don't know anymore. This is a specialist's knowledge. Finally some individuals in the local culture achieve a degree of coherence in rituals and other symbolic behavior and act as intermediates between the material and spiritual world. They are persons who possess sacred knowledge like the Bimo in Akha and Yi societies, or the Dongba in Naxi society, or the Lama among the Tibetans. We have to pay serious attention to this social differentiation of knowledge in the local communities when we study IK.

IK is holistic, meaning that it perceives the technical as well as the spiritual, the material as well as the symbolic, the real as well as the unreal world. A good example is the Ying and Yang, a holistic concept that explains metaphorically causes that emphasize the complementarity of opposites. Therefore IK cannot be tested in scientific categories like right and wrong, cannot be measured in any quantities, cannot be separated as only technical, or only rational. One has to look within the IK's own system of explanations for the particular relations of cause and effect.

Source: [Marglin \(1991\)](#)

Indigenous Knowledge

the knowledge of an expert, the scientific knowledge never enters into the area of sacredness because since the beginning of modern science, scientific knowledge has been secular (non-religious).

SK is analytical, meaning that the scientist, in order to understand a phenomenon, separates it into component parts. Each one is studied through methods that can give quantitative results but not a necessary or complete or articulated image of the functions that the parts have to each other.

CONCLUSIONS

Indigenous knowledge and scientific knowledge are different systems of generation, interpretation and use of ideas, perceptions, and feelings about reality. But one is not superior to the other. *Both are equally valuable. Study of indigenous knowledge requires awareness of our own knowledge in order to prepare to enter in a process of communication with local people. Communication means dialogue: exchange of ideas and perceptions to reach a common understanding.*

5. MAIN CONCEPTS FOR THE UNDERSTANDING OF INDIGENOUS KNOWLEDGE

In order to understand how indigenous knowledge perceives nature and uses symbols to convey the meaning of what indigenous peoples know about their resources, we need to focus on three concepts that will help us to study indigenous knowledge.

Cosmos: How indigenous peoples' view of the universe explains their engagement with nature

Corpus: The repertoire of ideas and cognitive explanations about nature

Praxis: The set of technical procedures by which nature is conserved

I. COSMOS

In the cosmovisions of indigenous peoples—that is, a people's vision of the entire universe, both known and unknown—what we call natural resources, environment, land, or nature, are perceived in a particular way, as they are embedded in the most diverse meanings attributed by the cultures.

Nevertheless, we can find some common traits in the culturally diverse world on how indigenous knowledge understands nature:

- It is sacred: therefore it is worshiped, respected and honored.
- It cannot be transferred other individuals or businesses: one cannot deplete it only for economic purposes without the risk of suffering sanctions. Therefore, the way that most indigenous people understand their relationship to nature is in terms of reciprocity, which means to take and return with a sense of equity and gratitude.
- It is to be nurtured: since it is the primary source of life that nourishes and teaches how to live.
- It is the centre of the cosmos: as nature provides material support, it is also the source of identity.
- It is a living being: as such, it is part of the social world together with animals, plants, and stones, and all living beings are in permanent communication.

Cosmovisions play the role of a regulating mechanism, translated in the customary laws and prescribing the culturally embedded rules on how to approach and use na-

ture. Therefore it is import to pay attention to the origin myths, rituals, ceremonies and festivals as acts of negotiation among all living beings. They contain the rules by which human beings participate in the social as well as in the spiritual communities.

Indigenous cosmovisions are currently endangered due to sedentarization. In most of the nations, where indigenous peoples have conserved their resources, the states are relocating groups of people who lack local knowledge of the areas. These displaced groups are inflicting terrible degradation on local resources to which neither the indigenous peoples nor science have alternative solutions. Most dramatic examples are in the Sahel of Africa and the Amazon tropical forest of Brazil. Even in the Arctic circum-polar regions, global warming and chemical pollution originating thousands of miles away are devastating the environment and her indigenous Inuit communities.

II. CORPUS

All indigenous societies have a long history of direct nurturing (as opposed utilizing or exploiting) of resources that is deeply rooted in their cosmovisions. Each one has produced a set of particular and complex ways of interacting with nature (5–7000 cultures and languages), which constitute the wealth of cultural variability and biodiversity (90 of bio-cultural diversity in the world).

These particular and complex ways of perceiving, conceptualising and symbolizing the direct utilization of resources is stored in a collective repertory of ideas that guides the resource conservation practices in each indigenous society.

Some important traits of the corpus of knowledge that has nurtured the conservation of biodiversity are:

- It is **ecological**: Every single manifestation of life (water, air, stones, mountains, plants, trees, mushrooms and so forth) bears a special significance.
- It is **historical**: The corpus is transmitted orally from generation to generation by means of the collective memory, which is the most important intellectual and creative resource of indigenous cultures.
- It is **systematic**: The transmission of corpus is well structured. For example, the classifications of plants, animals, rivers, lakes, mountains and so forth are conveyed in bodies of topics known as ethnotaxonomies, which encompass utilitarian as well as spiritual criteria.
- It is **time bound**: The best examples are agricultural or resource-use calendars. They reveal the conception of time by which the cyclic, reciprocal interactions with nature take place, linking the sacredness of such human action (the rituals)

with the practical uses (the technology).

- It is **accumulative**: It is also in the mind of some individuals who are not just knowledgeable but *wise*, because they synthesize personal and collective experiences in an outstandingly creative and powerful manner. They usually endowed with an exceptional long-term memory, like that of the Bimo, who can recall the names of ancestors extending more than sixty generations back.

A study of indigenous knowledge requires consulting these wise persons at least to obtain an historical perspective of the corpus of existing knowledge. A wise person of sixty can remember what he or she has received from the preceding generation (seventy years back). This person knows what he or she shares with the present generation and is in the position of transmitting his or her particular experience to the members of the next generation (who will hopefully perpetuate this corpus another thirty years if they do not succumb to lure and threats such as introduction of genetically modified seeds, depletion of resources, and urban values). This means that a wise person of sixty years can provide us with a temporal overview of a knowledge span of at least 100 years. Seventy years into the past and thirty in the future.

III. THE PRAXIS

Indigenous peoples subsist basically from ecological exchanges (nurturing nature) and not so much from economic exchanges (with the markets). The exchanges with nature are guided by a corpus of knowledge that praises diversity. This is manifested in practical behaviour in following terms:

- **Multi-use of resources**: Indigenous people have the capacity of transforming natural resources through integration of the different activities like agriculture, gathering, small-scale cattle raising, forest, collection, agroforestry, fishing, hunting, handicrafts, but with a clear vision of maintaining heterogeneity. That is why indigenous territories consist of a mosaic landscape of agricultural, swidden-fallow successional vegetations, grasslands, fish ponds, orchards, home gardens, and so forth. That is why most Indigenous territories look like a complex patchwork of agricultural fields, grasslands, ponds, orchards, home gardens and so forth. The multi-use of resources and multiplicity of engagement with the environment are possible due to the multiple objectives of indigenous people, which are expressed in their daily activities, agricultural calendar, life cycles and so forth.

Creation of mosaic-like landscapes represents a human-originated mechanism that tends to maintain and increase biodiversity. As a result of indigenous knowledge praxis, the areas where indigenous peoples exercise their indigenous knowledge, especially in their home gardens, agro-forestry patches and

poly-cultural fields are the real genetic banks for humanity.

In the persistence of the praxis of multiuse one can interpret how indigenous knowledge is dealing with the monoculture orientation of the policy and the market which favour one cash crop, intensification of land use, plantations schemes, agrochemicals, etcetera.

- **Maximization of resources:** Products and energy are recycled and not wasted. Indigenous peoples' households are a result of the generation of immense varieties of food (rices, potatoes, barley, wild vegetables, mushrooms), animals, domestic appliances, tools, herbal medicine, vegetable fibres for clothing, wool, housing materials like wood and tiles, and so on.

In the praxis of maximization we can see how indigenous knowledge efficiently and sustainably utilizes all the available resources, often repeated recycling them, without great disturbances of the environment.

The major disturbances of local environments are caused by the introduction of a single dominant animal or plant species or production systems that rely only on the economic (market-oriented) strategy.

- **Self-sufficiency:** Means that the indigenous praxis operate with low levels of input and high outputs. This mechanism of self-sufficiency is seriously affected by the commodification of livelihoods.

CONCLUSION

The concepts cosmos, corpus and praxis are inseparable in the analysis of human behavior. They are helpful for researching and understanding the complexity of meanings expressed by indigenous knowledge. In the last thirty years, botanists, ecologists, anthropologists, and linguists have stopped merely collecting descriptive data that does not explain the principles and the ways in which ideas orient human action. With the help of these three concepts, science has evolved to produce significant fields of study like ethnobotany, ethnoecology, ethnobiology, ethnogeography, ethnotaxonomy and ethnomedicine. These fields all share the prefix 'ethno', which means 'people' or 'cultural group', stressing the exploration of how nature (plants, landscapes, life, geography, classifications systems and medicine) is mentally constructed from the point of view of indigenous knowledge, and how indigenous peoples represent their use of resources in their cultural images and symbols.

6. DIVERSE SYSTEMS

Indigenous Knowledge (IK) is distinct from cosmopolitan, urban or scientific knowledge in that the people who generate and use it belong to rural societies with long-established, intimate relationships with their local environments and ecologies. It

cannot be simply called traditional because the word ‘traditional’ connotes a prejudice of conservatism and resistant to technological change. Indigenous knowledge should be recognized as consisting diverse systems of generation, transmission and use, with epistemologies based on their own scientific principles built up through thousands of years of empirical observations and experiments of indigenous peoples.

CULTURALLY EMBEDDEDNESS AND LANGUAGE AS A VEHICLE FOR INDIGENOUS KNOWLEDGE

As diverse systems, bodies of indigenous knowledge consist of collective experiences accumulated throughout history and transmitted from parents to children within the frame of local cultures. The main vehicles for communicating indigenous knowledge are local languages, oral or written. Therefore, cultural expressions such as stories, songs, proverbs, music, dance, handicrafts, myths, values, and beliefs constitute the central focus of attention required to understand indigenous knowledge. Local languages contain concepts and names for everything they perceive in nature as classified and quantified within their own logical systems.

Akha (Hani)

For example, Akha (Hani) people from Xishuangbanna, in Yunnan, perceive themselves as part of the natural world in which everything has its own spirit. Certain forests are the home of spirits and therefore taboo for the Akha villagers. Collecting certain products, cutting trees, or hunting are forbidden in four types of forests identified as sacred:

- *Lawbyum*: the burial hill forests where the ancestors live
- *Puchan*: the village protecting forest belts that separate the human world and the spiritual world
- *Misan-sanchu*: the virgin forests where the Earth Spirit lives
- *Nejawdu*: the sacred sites where various spirits live ([Pei Shengji and Luo Peng, 2000](#))

In PTD-action the cultural dimension of knowledge is taken into account. This means that, in order to jointly plan protective measures of the forests, it is necessary to include Akha (Hani) conceptualizations, their ways of perception and classification of the forest.

Naxi

Another case that illustrates how knowledge is embedded in culture comes from the Naxi people in Lijiang. Most communities conceive the relationship between nature and human beings as if “nature and humans were two brothers with the same father and different mothers.” The complexity of a spiritual linkage of all living beings in Naxi language is called Shu.

From this idea, the Naxi people construct explanations about what the consequences of human behaviour are when one of the brothers starts to get greedy and cuts the trees or hunts too many animals, or if the fields are not cultivated properly. Improper utilization of the resources are like rivalries within the family and the cause of many disasters. The important value of taking only what is necessary from nature is broken. As a result, humans have to repay the debt to nature by engaging in certain rituals. Naxi people think of nature as a living being that deserves respect and care and should never be exploited. It is due to this cultural principle that Naxi people preserved the good condition of their relationship between nature and humans (Yang Fuquan, 2000).

In PTD the cultural dimension of knowledge does not play the role of a barrier or a superstition, it is the common ground to jointly plan future actions.

POWER

Indigenous knowledge also implies a relationship with mainstream society summarized in the questions of whose knowledge counts and who benefits from the use of knowledge. When local people make decisions about agricultural practices such as the use of their own rice seeds versus high yielding varieties, and relying on organic methods as opposed to applying chemical fertilizers, they are confronted with serious dilemmas. Each alternative implies different knowledge systems. Using their own seeds means reliance on the practice of selecting and reproducing the local races in plots that are ecologically adapted as the result of hundreds of years collective experience. A decision to use HYVs requires following the instructions of the seed company or the extension services of outsiders whose knowledge lacks awareness of

the local conditions. It implies submitting not only to a market orientation in order to pay for the inputs from year to year but to a whole new structure of distribution and finance controlled from the outside with values, needs and objectives vastly divergent from local ones. If we look at who benefits from the use of chemicals as opposed to organic practices, we can clearly see that it is the chemical industry and associated marketing and finance interests.

Firstly, the economic power of these companies and the hold it gives them over the lives of local peoples increases since the farmers have to apply more and more chemical fertilizers and pesticides to their plots once they start with these industrial inputs. The labor of the local people, which once turned local resources into locally consumed use values, is replaced with high-value products for which local people must exchange their low-valued labor, such that their lives become engaged in reproducing the labor and capital represented by the chemical companies and no longer life in their own communities. Due to the unequal rate of exchange, it means a necessary transformation of the local community, expropriation of lands, transformation of the manner of production, usually accompanied by migration of the productive segments of the population out of the local area in search of low-paying and low status urban jobs, or worse.

Secondly, in the case of most flower and vegetable producers in Yunnan, the soil, water, air and people become contaminated. The seed resource loses its reproductive quality and generative capacity—of not just life in the form of the plants themselves, but in the broadest sense of family and community—and people are confronted with environmental problems that endanger future agricultural pursuits. In summary, reliance solely on the products of scientific knowledge undermines indigenous knowledge, with the consequence of discrediting the associated life-style and culture, of dismantling the complex natural and human relationships referenced by this knowledge, and of generally disempowering of indigenous peoples.

IK AND IDENTITY

IK is not fossilized into traditions that are unable to change. It is related to cultural identity and is adapted to the self-definition of peoples. Cultural identity is alive; it reacts with multiple interactions in the wider society. As long as local people remain in their territories, with their own political institutions, customary laws and distinct cultures, their traditions will remain firm.

Yi

A good example of indigenous knowledge and identity is the case of Yi people from Chuxiong Autonomous Prefecture. They have a long tradition of plant worship. At least 21 species of flowers that grow in the forests of Yi communities are protected. They also have special festivals that are named by plants. The Day of Ma Ying Hua (*Rhododendron delavayi*) is the celebration of the Flower God on March 3, and the Flower Day on February 8. These are just two examples of the rich calendar of indigenous festivals that Yi people follow in belief that flowers and other plants were their benefactors in the creation of human society. Every household has various *popos*—small human forms made with different plants placed on the wall of the kitchen. These represent their ancestors and are therefore sacred and inviolable.

As long as Yi people maintain their forests, where rich plant resources grow, their plant worship, a cult to their ancestors and their identity will remain firm. The knowledge of plant forms the basis of a tradition of protection by Yi communities. These plants support their identity and hence the preservation of the forests. Yi people would never deplete the flowers, something that would be tantamount to destroying their own identity, and thereby themselves (Liu Aizhong, et al., 1997).

INTERACTIONS WITH NATIONAL SOCIETY

Indigenous knowledge is a product of a local context and is deeply embedded in the local culture. Any cultural transmission from indigenous peoples to national societies has to involve the free and informed consent of the former and the openness of the latter. This requires mutual respect and understanding and cannot occur while feelings of inequality persist between the two types of society. An example is the scientific polemic about the sustainability of swidden agriculture that is derogatorily referred to as ‘slash and burn’ and therefore considered as environmentally unacceptable. Without a process of mutual assessment of the complexity of advantages and disadvantages of swidden agriculture and the assertion of political power, many agricultural institutions simply censure this agricultural practice. For indigenous peoples, swidden, which is also known as both ‘shifting cultivation’ and ‘forest fallow’, is part of a repertoire of sophisticated techniques that have made sustainable rotational agriculture within the forest possible for millennia.

IK IS HOLISTIC

Concepts such as technical and aesthetic, economic and spiritual or landscape, lands, earth and territory are arbitrarily distinguished as separate components for an all-embracing notion of territory. In the same way that indigenous territories are extremely diverse, so are the collective relationships that bind peoples to a territory. Thus knowledge, territory and identity, as are peoples, are interrelated. Knowledge therefore cannot be separated from the human and natural environment.

Dai

The Dai people's knowledge illustrates another example of indigenous conceptualisation that expresses the interrelationship of human beings and nature. They understand that the world where life takes place consists of five major elements: forest, water, land, food and humans. They perceive the forest as the cradle in a chain of reciprocal relationships: water comes from the forest, land is fed by water, and food comes from the land that is fed by water and rivers. The forest supports human life, and the forests are one with the supernatural (Pei and Liu, 2000).

In the past, this way of thinking has contributed to the protection of mountain forests in Dai territories. However, in the last two decades, externally driven development along with a fragmentary approach to nature is seriously impacting the human-nature balance among the Dai. Modernization privileges the market economy over other forms of social integration, leading to invasion of more natural forests by cash crops such as cardamom or rubber trees. The chain of reciprocal relations as part of the holistic knowledge of the Dai culture is being threatened because economic goals do not provide sustainability within indigenous society.

CHANGE AND CONTINUITY

Indigenous knowledge is not just a fixed set of abstract classificatory rules. It has developed from a multiplicity of activities and long-term observation that are largely tacit and which embody a multitude of skills and practicalities. Therefore it cannot be understood according to a set of rigid prescriptions. On the contrary, far from rigid, indigenous knowledge is constantly being updated and changed. If these changes take place within a framework grounded in indigenous institutions and customary legal systems, they lend to cultural continuity. Even the impact of externally driven change shows the flexibility of indigenous knowledge.

Lahu (Kucong)

For example, the Lahu, as named officially (they call themselves Kucong), in Jinping County have been and continue to be culturally hunters and gatherers. They are adapting to new conditions in terms of their livelihood and their knowledge, building new abilities relying on protective practices but recreating them in a new form. Since 1957 they have faced significant changes with their resettlement from their pristine forests to a sedentary life style in villages in which they cultivate rice paddy and upland maize.

The Lahu have been forest dwellers for generations, accumulating extensive environmental knowledge on the uses and conservation of the mountain forest resources. One basic principle of Lahu knowledge is to conceive the Xilong Mountain as sacred since the gods of nature live at the top. According to their customary law, this area has been excluded from hunting, collecting plants, wood fuels and stones. Lahu people believe if they protect the habitat of the gods they will be protected from natural disasters and social damages.

The Lahu have mountainous origins in altitude ranges between 1,090 and 3,074 meters above sea level. Their area represents one of two mega-biodiversity areas of Yunnan Province due to the complex geographic and climatic patterns. It can be said that there are different seasons at different elevations on the same mountain, and two adjacent sites have different weather. Before the resettlement, Lahu life relied on the direct use of forest resources from where they obtained adequate and diversified food. Migration in these diverse landscapes correlated with swidden agriculture and was socially organized on the basis of the *ka*, a kinship independent unit. They practiced “silent trade,” that is, leaving collected products along the road and hiding them in the forest for exchange with outsiders’ crop products.

At present, Lahu livelihood as hunters and gatherers seems impossible. They lead sedentary lives in villages located in the middle zones of the Xilong Mountains and their territories have been reduced to agricultural plots. Their access to the forests is limited by the rules of the Xilongshan Nature Reserve Forest Management.

In spite of these externally driven changes of life conditions, Lahu people have re-created the rules of agricultural production according to their collector’s mentality. Rather than conform to rice and maize cultivation with the technical help of the local government extension, they are combining terracing learned from Hani people and shifting cultivation, which they have

always practiced. In this way they supplement the low outputs of the official rice and maize cultivation. They have added cassava and other vegetables to the swidden fields. In order to increase the biodiversity they once enjoyed, they also engage in home gardening. The Lahu cultivated gardens are not as diverse as the natural forest in which they once had their homelands, but they are recreating a comparable landscape with fruit trees and vegetables. Lahu healers are trying to recover some endangered medicinal plants by growing them in their home gardens. The hunting activities and the collection of forest products like wild vegetables, nuts and medicinal plants have shifted from a subsistence orientation to cash income generation.

Since the Lahu have lost access to the high forest areas they perceive as “sacred mountain,” this rich indigenous reserve has been replaced by the *mikaisjie* or sacred grove. Many Lahu villages have their own sacred grove nearby their villages, where they practice ecological knowledge, protecting and worshipping these small areas in order to be protected by the gods of nature (Huai Huyin, et al. 2000).

INDIGENOUS SPECIALISTS

Indigenous knowledge is communicated as experiences gained by the ancestors to subsequent new generations. This temporal transfer of collective experiences is rooted in practical activities as well as oral languages, written heritages and other symbolic forms of representation. All members of the community—elders, women, men and children—are integrated through local practices and languages and share various kinds of knowledge for securing their livelihoods depending upon social position. Besides the gender and generational differences due to roles and tasks in society, there are levels of specialization according to access, use and types of knowledge.

Akha (Hani)

Among the Akha people of Mengsong, Xishuangbanna, all villagers, men, women, elders, and youth share a basic understanding of the practice of land

use in an ecosystem that varies from 800 to 2,000 meters above sea level. Boundaries between production zones are easily distinguished, including paddy field terraces, swidden fields, agro-forestry tea gardens, community protected rattan forest (*Sangpabawa*), home gardens, forest for timber and firewood and water source forest. Individuals within the community who have a deeper understanding of swidden fields can identify over 155 species of plants used for crops, medicinal, recreational and religious purposes. Other individuals who have greater knowledge about seed conservation are able to cultivate home gardens containing at least 227 plant species. Yet others are talented in forecasting weather, plant and animal identification, and so forth. Social recognition of these indigenous specialists make them reliable partners in participatory processes.

In local communities there are other types of knowledge that are not equally shared by all members. It arises from revelations received from the spiritual world. Indigenous peoples who practice these types of knowledge are also specialists, but in the sense that they use methods quite distinct from those of western scientific methodology.

The division between technical and spiritual knowledge is difficult to distinguish, because these specialists do not make such a distinction.

Continuing with examples from Akha culture, the community protected rattan forest *Sangpabawa* until 150 years ago with regulations shared by all villagers. The eldest of the clan, the priest or *Boemo* and the village leader or *Zoema* establish the appropriate time and quantity of the harvest. During the swinging festival, which takes place in July after the transplanting of rice seedlings, Akha people celebrate the beauty and the best qualities of their knowledge. The *Boemo*, a man with an extraordinary memory, capable of recalling the names of male ancestors going back sixty generations, recites ancient oral traditions regarding the origins of the Akha. He brings the past (the world of the ancestors) into the present (this world) by remembering the origin of the *Yailkuqq*, the swinging festival (Wang Jianhua, 2000).

Indigenous specialists possess a domain of knowledge with particular tasks that go beyond the technicalities of forest management. The knowledge practiced by indigenous specialists provides material and also symbolic and ritual needs of local people and very often falls into the realm of secret and sacred knowledge.

The knowledge of these specialists, sometimes called shamans, has the general function of maintaining stability and harmony in the relationship between nature and humans. Dealing with such indigenous specialists, requires not only an equal-to-equal relationship but also an intercultural approach based on a special attitude of respect and admiration for the rituals and the meaning of the cosmovisions or local philosophies in which they are embedded.

A shaman is an intermediary between the human and the spirit worlds. He or she is a common person in daily life but on certain occasions achieves psychic states, due to praying, dancing or other means. Shamans are able to foresee the coming rain, dream about the time of harvesting, obtain revelations from the spirits regarding use of forest resources, or conduct ceremonies against evil spirits affecting crop production. Many shamanistic practices concentrate on recuperating health, including insects, animals, and humans. They reestablish harmony at all levels of manifestations of life.

7. HOW TO UNDERSTAND INDIGENOUS KNOWLEDGE FOR PTD ACTION

WE ARE OUTSIDERS

The above explanation about the nature of indigenous knowledge should make it clear that PTD is dealing with *three interacting interdependent systems* that represent a survival value to indigenous peoples: *knowledge, culture and biodiversity* ([Grenier, 1998](#)). That indigenous knowledge meets subsistence, health, trade, ritual and spiritual needs of local peoples makes it fundamentally different from our knowledge. Indigenous knowledge has its own dynamic processes based on creative, innovative and experimental approaches to the local environment.

In spite of this, indigenous knowledge is not an isolated system. Essential components of indigenous knowledge are products of external relationships with neighbouring communities, including non-indigenous people or “outsiders.” The latter is a complex topic with historical roots in encounters between peoples, in which one group, the civilizing center, interacts with other groups (the peripheral peoples) in terms of a particular kind of inequality ([Harrell, 1995](#)).

This legacy is still in evidence. Nowadays, social, physical, biological, agricultural scientists, development agents, government officials, non-governmental practitioners and others—the so called non-rural outsider actors—are interacting more frequently

with indigenous and tribal peoples, and ethnic minorities or farmers in the context of development action. Many outsiders ignore or belittle indigenous knowledge, portraying it still as primitive, static, superstitious or folkloric. Due to racism (knowledge is superior based on skin color), ethnocentrism (believing ones cultural categories are the only true and correct ones) or blind modernism (modern technology will solve all the problems of humankind), outsiders neglect or are sceptical of the value of the contributions indigenous knowledge can make for humankind. They engage in development work within the terms of mainstream policy, irregardless of and at the expense of local techniques, specialists, cultures and languages, accelerating the extinction of local plants, animals and ecosystems.

The impacts of externally driven technical and economic solutions in local communities undermine the sustainability of the rural world and the integrity of the earth's biosphere. They diminish local people's self-confidence in their knowledge capacity to deal with natural resources and undermines their self-esteem and ability to help themselves. It produces a vicious cycle of prejudices that say local people need to depend on external solutions to solve their local problems.

Knowledge: socially constructed concepts and practices that guide different human approaches to living

Culture: the process of creating and attaching diverse meanings to human action

Biodiversity: all living organisms, their genetic material and their ecosystems modified and conserved by knowledge and cultural action

By engaging in a PTD interaction as conscientious outsiders, we can enrich our understanding of indigenous knowledge by gaining awareness of our own categories of knowing, perceiving and believing. This occurs when we interact with local people at a deep human level allow their answers to become mirrors to ourselves. We can learn a new meaning of our scientific principles, of our own cultural heritage, and of values attached to biodiversity.

DIALOGUE BETWEEN DIFFERENT KNOWLEDGE SYSTEMS

Another basic premise to understanding indigenous knowledge for PTD action is to recognize that if local people can situate indigenous knowledge within the own culture's framework of meaning and tradition of biodiversity conservation, indigenous knowledge has the full capacity to creatively transform and use information in new

circumstances.

From assessment of approaches based on unilateral transfer of technology, we learn that diffusion of external knowledge becomes threatening to local livelihoods when people are unable to visualize and decide, both practically and conceptually, about the benefits that the new knowledge brings. In the PTD process our role is to create a bridge of understanding between our knowledge and indigenous knowledge in order to improve and guarantee the continuation of local life in a global society.

There is a growing awareness of indigenous people's demands to be heard in development decisions on the basis of a dialogue—that is, the process of reaching understanding between subjects of different knowledge heritages on a basis of equality. Understanding this implies a personal way to interpret meaning. In the dialogue between different knowledge systems for PTD action, there is no neutral point of view or collection of real facts. To be able to understand other knowledge requires openness of mind, empathy and awareness of our mental frames, and furthermore “we should always accept that the other party could be right” (Dhamotharan, 1990).

PTD goes beyond the technocratic transfer of technologies. It is a long-term interaction between knowledge systems involved in the generation of creative and ecologically sound models to address the use and nurturing of natural resources.

KNOWLEDGE ABOUT AGRO-BIODIVERSITY

At the beginning of the twentieth century, China was among the most productive lands in the world using mainly Chinese agro-technology. The yields in terms of rice and wheat and the quantity and diversity of vegetables met the needs of a dense population. Intensive, highly diversified agriculture based on the recycling of nutrients and organic raw materials (what scientific people call ‘wastes’) was the most outstanding feature of Chinese farming systems that provided sufficient food and a balanced diet to the large majorities. Natural catastrophes sometimes caused poverty and starvation, but mostly it was rapacious elites, corrupt officials, soldiers and bandits within the context of colonial dismemberment of the country rather than agricultural inadequacies that were to blame (Anderson, 1998; Lippit, 1974; King, 1911).

Chinese farmers based their agricultural practice on a long and shared experience with concepts of biological chains (what is now labelled organic farming) complemented by dedication and devotion to their lands. Farmer specialists practiced an intense care in the choice of cultivation sites, taking into account the elements of wind and water (*feng shui*). Groves of trees protected the villages, and measures against landslides and floods were part of the rural landscapes. Special agricultural knowledge and wisdom based on customs and a shared empirical basis were efficiently applied to take advantage of the resources. Rural Chinese people utilize an

immense number of elements in nature and include many natural products in their diets: flowers, mushrooms, ferns, insects, dogs, cats, and internal organs, to name a few, that for the most part the rest of the world refuses to eat.

A special trait of Chinese agriculture is that much of the agrodiversity developed in their diets is due to the traditional medical cultures entailed by diverse models of understanding nature. Foods are generally eaten to maintain balance in the body and mind. The theoretical principles of health and harmony (the ying and yang theory) have evolved hand in hand with agricultural knowledge for more than 4,000 years as part of innovative eras in the Chinese history of science.

Nowadays, intrinsic to agricultural knowledge systems in China, we find that the logic and the practice of biodiversity conservation is a twofold biological and cultural process, especially among ethnic minorities. They have preserved at least a reasonable proportion of tree cover ([Anderson, 1988](#)), and due to their nurturing approach to nature we can clearly establish a correlation between ethnic inhabited areas and biodiversity hot-spots.

PTD action therefore recognizes the contemporary holders of knowledge about biodiversity—farmers, ethnic minorities and indigenous people—as innovative partners in the joint construction of a vision of global sustainability harmonizing the needs of local economies and the environment within a framework of equity, justice and cultural diversity.

8. INDIGENEOUS KNOWLEDGE AND BIODIVERSITY

FROM THE YUNNAN INITIATIVE 2000

The Yunnan Initiative calls attention to the decline of biodiversity and the threats that local and indigenous cultures face as they strive to sustain and nurture their diverse eco-cultural landscapes in which they live and on which they depend. Among the most powerful contemporary forces contributing to the decline of cultural and biological diversity are the expansion of global markets and unsustainable development policies.

Participants of the Cultures and Biodiversity Congress, held in Yunnan Province, China, from 20 July through 30 July 2000, drew up “The Yunnan Initiative,” which identifies not only principles and potential actions but also an overall vision to enhance the ability of local groups—acting alone or in collaboration with other local groups, non-government organizations (NGOs), government or business—to strengthen their evolving cultural traditions while finding innovative solutions for improving their livelihoods and conserving biodiversity. The Yunnan Initiative acknowledges the importance of agrobiodiversity as a resource for local and indigenous communities.

The Yunnan Initiative supports the strong link between cultural and biological diversity as expressed in the Declaration of Belem, the Kunming Action Plan, and the Code of Ethics of the International Society of Ethnobiology. The Yunnan Initiative also endorses the Convention on Biological Diversity (CBD) in its recognition of the necessity for respecting cultural and spiritual values to achieve sustainable development and the central importance of local communities in the *in situ* conservation of biodiversity.

The Yunnan Initiative outlined in the following section recognizes the leading role that local cultures have played in creating and maintaining biodiversity. It also stresses that this linkage is under threat from many directions, including various government policies and programs as well as commercial activities that reduce local rights to and responsibilities for natural resources. While recognizing that some local cultures are more resilient than others, the Yunnan Initiative reflects an optimism that many local groups can continue shaping and strengthening both their cultural and biodiversity heritages when appropriately assisted by the non-government, government and commercial sectors of society to ensure an equitable and sustainable stream of benefits. Collaboration among these groups that involves participatory processes and utilizes both local and scientific languages and knowledge is essential.

PRINCIPLES

1. There is an *inextricable link* between cultural, language and biological diversity that emerges from historic ties to land and territory

This means that language is essential for the transmission of traditional ecological knowledge which is central to ethnic identity and well-being. Knowledge and culture are anchored to land through sacred, historical and heritage sites, many of which may define territories that extend beyond current areas of habitation. These sites may actually provide the spiritual source for knowledge.

2. *Life* is part of a *whole* that is lost when reduced to mere “components” for human use or commercialization

This means that knowledge or genetic resources cannot be removed from local communities without breaking their spiritual and holistic links with the culture and land.

3. Knowledge, innovations and practices of indigenous and local communities are essential for effective *in situ* conservation of biodiversity

Traditional knowledge is, by its basic nature, dynamic and innovative. This essential point is recognized in Article 8.j of the Convention on Biological Diversity (CBD), which calls for the wider use and application of knowledge, innovations, and practices of indigenous and local communities that are relevant to the conservation of biodiversity. Although the CBD precariously implies that traditional resources can be treated as “components” that can be removed from their cultural contexts, it nonetheless provides a powerful political basis for empowering indigenous and local communities.

4. These knowledge, innovations and practices are mostly *collective* (community, gender, lineage or specialist sub-groups) and may have sacred or heritage values, making them inalienable treasures with ancestral or spiritual dimensions

Knowledge is collectively held, but not always at the community level; its guardians may be different sub-groups within a village or larger units of the ethnic group. People are likely to be the stewards of traditional resources rather than owners; therefore, sale or transfer may not be possible.

5. Effective use of knowledge, innovations, and practices depends on local participation and collaboration through partnership and dialogue, which require *equity of power relationships*

This means that true dialogue can only occur between equals. If equity does not exist, then dialogue will not occur and partnerships are impossible. Thus, equity of power relationships must be established before any advances can be made; this may require significant changes in land and resource rights, as well as capacity-building, training, education, and greater access to legal and political mechanisms.

6. “Enhancement” of local communities depends upon development of *adequate mechanisms* for benefit-sharing, capacity building, and protection (of the “inextricable link”)

Equity of power relationships may have to be established through the de-

velopment of skills and experiences that provide local communities with effective means of communication and access to legal and political means. They must also reap unequivocal benefits from their collaboration with outside agencies, institutions and individuals.

7. Planetary survival depends upon the effectiveness of *human actions* now

Increased erosion of biological and cultural diversity will contribute to global environmental economic and social instability. This means that those who ascribe to this strategy must become *proactive* in the promotion of its Principles and Actions in ways that are culturally and political appropriate for their nation, region, and locality.

The following additional principles emerged from the group presentations. They present a more detailed intermediate position between the above normative principles and those principles which guide actions.

Indigenous communities are dynamic, learning organizations of diverse people with the normal human tendencies toward conflict and its resolution and toward adaptation to external influences. Moreover, communities vary greatly from one to another in how they are structured, what they value and need, and how they resolve conflicts and adapt to change.

Diverse ecosystems, cultures, languages, skills and products are tremendous resources in a global economy, and controlling their exploitation and degradation is an important national investment.

Indigenous communities have earned legal rights to values they have created. They deserve the empowering awareness of the unique value of their knowledge, skills, landscapes, and ways of living.

Governments and markets need diverse cultures and natural systems. They typically homogenize communities, cultures, languages and natural systems to facilitate control through uniform actions, expectations and rules, a process they see as 'rationalization'. The result is destruction of diversity and the well-being it provides, establishment of uniform policies that actual diverse behaviour will breach, or valuation of uniform products, skills, and knowledge so as to encourage relative simplification and depletion of natural and cultural systems.

There is a need for strengthening the means to protect and encourage cultural and biological diversity, despite pressures for homogenization, and to translate the benefits of diversity so as to change these pressures to favour rather than undermine diversification. Such means include the full representation of diverse cultures in settings that permit open and equal interchange with dominant cultures; opportunities for market protection, influence, and fair benefit for distinctive products, skills and contributions; the diversification of landscape uses, reserves and species composition; and functioning processes of fair adaptation and conflict resolution from village to higher levels of governance.

Successful policies are formed through the full and fair engagement of all parties they affect.

Bridging institutions—learning, scientific and mediation centers, for example—facilitate and diversify relations between communities, governments, and markets.

Equalize the valuation of knowledge systems and cultures and build modes of trans-cultural change to achieve new and mutually beneficial syntheses. The integrity and well-being of communities grows with their capacities to understand their own special resources, abilities, and landscapes and to act in ways that use their special qualities to best advantage. Scientific capacities are needed to understand and use traditional systems of explanation and to work with communities through an emerging meta-language and methods of collaborative science. Governments need capacities to work with and enhance diversity and to gradually replace uniform prescriptions with policies that seek and benefit from diverse responses.

Mass media offer means to advance regard for cultural diversity and biodiversity and to build the community confidence, knowledge and resources that help villagers to advance practices and achieve policies to sustain them.

Seeds, symbols, ceremonies and systems of livelihood and landscape embody the historical experience and collective knowledge of a people.

Tourism, as well as science, should be developed only as a mutual opportunity for exchange, learning and benefit between hosts and guests.

THE CONVENTION ON BIODIVERSITY IN CHINA

With a large area and wide range of natural and geographical conditions, China has a rich biodiversity. China's biodiversity ranks eighth in the world and first in the northern hemisphere. Its main characteristics are as follows:

1. China's land and water areas include many diverse ecosystems. Terrestrial ecosystems can be broken into 27 broad categories of 460 types. There are 16 broad categories of forest, consisting of 185 types; four broad categories of grassland, consisting of 56 types; seven broad categories of desert, consisting of 79 types; five broad categories of wetland and freshwater areas; and six broad categories of marine ecosystems, consisting of 30 types.
2. China has a great variety of plant and animal life consisting of both indigenous and exotic species. More than 32,800 species of higher plants and about 104,500 species of animals have been identified. During the Quaternary period, the palaeolithic continent of China was not greatly affected by the glacial movements, allowing for the survival of many ancient plant and animal species.
3. China has been very successful at cultivating hybrid plants from a wide range of wild species, making China one of the world's three largest centres of origin for cultivated plants. There are 237 species of cultivated plants, and many species genetically related to cultivated plants still exist in their wild form. In China, there are more than 600 species of commonly cultivated crops, more than 10,000 species of fruit trees, and more than 400 species of domestic animals and fowl.

China has signed the United Nations Convention on Biodiversity and is preparing to implement a national action plan in accordance with the Convention. Since the 1950s, the Chinese government has formulated guidelines and policies for protecting biodiversity and has taken a series of measures to protect biodiversity, while at the same time promulgating laws relating to the conservation of biodiversity.

General policies for natural resources, animal and plant conservation, and biodiversity are as follows:

1. The policy for natural resource conservation in China is "overall planning, active conservation, scientific management, and sustainable use."
2. The policy for wild animal conservation in China is "strengthening resource conservation, actively domesticating and breeding, and rationally developing and utilizing."

3. The policy for biodiversity conservation in China is “laying equal stress on both the development and utilization and the conservation and protection of natural resources” and “the person who develops, conserves; the one who utilizes, compensates; the one who destroys, restores.”
4. The China Programme for Natural Conservation published by the Environmental Protection Committee of the State Council in 1987 is the first strategic document on conservation in China, and it provides the overall strategy, fundamental principles and general response measures for the protection of biodiversity in China.

THE ARTICLE 8J OF THE CBD: ROLE OF INDIGENOUS KNOWLEDGE AND PRACTICES

Article 8(j) of the CBD states, “subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.”

But conversion of these words into reality faces many challenges, not the least of which is the need for direct involvement of the great diversity of the world’s indigenous peoples.

From the White Paper on Biodiversity and Sustainable Development:

20.41 There are 55 minority nationalities in China, with a total population of 91.2 million (8 of the total population). There have been 159 minority nationality autonomous districts set up (5 autonomous regions, 30 autonomous prefectures, and 124 autonomous counties). These are widely spread throughout areas containing valuable natural resources, and subsequently each region plays an important part in the nation’s sustainable development.

20.42 Generally speaking, the minority nationality regions are poor. Economic structures and necessary technologies are inadequate, and consequently utilization of natural resources is of low intensity. With increasing modernization and a growing economy, many environmental problems are beginning to emerge.

20.43 It has already been stipulated by law that the minority nationality regions enjoy the right of autonomy, so programs must be created to carry this autonomy

into matters concerning sustainable development.

20.44 The Qinghai-Tibetan Plateau embraces the largest population of China's minority nationalities. It has large amounts of valuable natural resources, but owing to its harsh natural conditions and to particular historic circumstances, the economic development of this area remains limited. Production is of low intensity, and because of bad management techniques, wasteful resource exploitation and environmental pollution are serious. The implementation of the Programme for Comprehensive Development of Nationality Economy and Ecological Environment of the Qinghai-Tibetan Plateau (simply known as Project 9525) will not only contribute to a solution for the environmental protection and sustainable development of this region but also provide experiences for other minority nationality regions and thereby promote sustainable development of all the minority nationality districts.

20.45 Efforts should be made to improve legislation concerning minority nationalities—such as the laws related to the exploitation of resources, the state support of policies and popularization of science and technology, and the relevant autonomous regulations—in such a way that it promotes the capacity building of minority nationalities and their regions.

20.46 Mechanisms should be set up to allow minority nationalities and minority nationality districts to participate at state, regional and local levels in the formulation of policies and strategies concerning sustainable development, as well as in their implementation.

20.47 Measures should be taken to implement the program for comprehensive development of minority nationality economies and the healthy environment of the Qinghai-Tibetan Plateau. This project covers the whole of Tibet, the Haixi, Yushu, Guolou and Huangnan autonomous prefectures in the south of the Qinghai Province, the Ganzhi and Abei autonomous prefectures in the south of the Qinghai Province, the Ganzhi and Abei autonomous prefectures in the west of Sichuan Province and the Diqing autonomous prefecture of Yunnan Province. This area measures more than 2 million square kilometres. The implementation of this program will take 25 years.

20.48 Plans should be made to further improve state-level legislation for autonomy of minority nationalities, so as to consolidate legally their right to participate in sustainable development. Minorities in the autonomous regions should also be allowed to implement state laws and regulations regarding sensitive environments and natural resources enabling them to accommodate unique conditions specific to each autonomous region and to draw up more specific regulations when necessary.

20.49 Plans should be drawn up for the state to adopt policies in support of the minority nationality regions according to each region's unique conditions and needs.

The state should financially support the minority nationality region in the areas of technology, facilities and professional personnel in order to raise the quality of enterprises in these regions. When developing and managing the resources in these areas, considerations should be given to the benefit of the local people who depend on those resources for their livelihood, and substantial measures should be taken to help solve their problems. Programs should be created to provide technical and political guidance according to each region's needs. The state can give guidance on the implementation of strategies for sustainable development in minority nationality regions through various kinds of pilot projects.

20.50 Measures should be taken to encourage minority nationalities and minority nationality districts to participate in sustainable development. The right to autonomy of the minority nationality autonomous regions should be fully respected and its realization ensured. The right of the minority nationalities to manage their land and other natural resources should be protected by law. Their unique ethnic cultures should be protected and their customs and traditions respected. National minority citizens should be given a greater role in policy-making concerning economic development, environmental protection, and natural resource utilization in their respective regions. Efforts should be made to train a large number of minority nationality cadres and science and technology personnel. Education should be provided to all minority nationality citizens regarding laws and regulations and scientific knowledge concerning environmental protection and sustainable development. Education will in turn promote environmental consciousness and thereby develop a social atmosphere of conscientious environmental protection and conservation of natural resources. Help should be given to the minority nationalities and minority nationality districts to prepare management plans for the conservation of natural resources. Professional advice when given should incorporate minority value systems, traditional knowledge and traditional ways of resource management. Furthermore, support should be given to use of pollution-free production methods to promote a pollution-free environment and sustainable development of the minority nationality regions.

9. DEVELOPMENT IN PTD

The D in PTD stands for development of technologies and generation of knowledge, and it also has a particular meaning.

The concept of development in the context of PTD emphasizes the creativity of local people, their ingenuity and imagination to carry out self-defined paths in the future. It recognizes that local people in their communities have ways of dealing with their problems and their own initiatives that we as outsiders can support as facilitators.

INITIATIVES are social processes from within, to cope with a great range of unfavourable conditions as well as to maintain and improve livelihoods. Indigenous initiatives are new, self-generated actions based on indigenous knowledge and are part of a policy of sustainable development.

SUSTAINABLE DEVELOPMENT

Sustainable Development stresses the following values:

- People centeredness, meaning that people should increasingly take control over their lives to guarantee the continuity of their families and communities in the future.
- Cultural diversity, meaning that there is no single development path. Instead there are many developments emerging from all existing local cultures, with their own value systems, forms of knowledge, and impulses.
- Sustainability, meaning giving all forms of life a future. Sustainable development is committed to a healthy environment and local forms of justice and equity.

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Chapter 3: PTD Methods

- 1. Towards the Facilitation of Sustainable Processes**
- 2. The Uses of PTD**
- 3. Favorable Conditions for the Application of Tools of PTD**
- 4. The Tools of PTD and their Detailed Description**
- 5. Rules, Tips, and Ethics**

1. TOWARDS THE FACILITATION OF SUSTAINABLE PROCESSES

The technological expansion of modern scientific knowledge has no doubt brought to the world significant improvements. At the same time, the practical consequences of accelerated technological changes are visible in the deep ecological crisis faced by the planet which is affecting local communities. This alarming situation is partially due to top-down methods in which the expansion of modern scientific knowledge has taken place, reducing the confidence and reliance of rural peoples in their knowledge for making decisions over the use of their local resources.

The awareness of this crisis is a felt need among environmental politicians, development agents, scientists, ecological activists and social movements of indigenous peoples for reorienting the conventional development paradigm towards sustainability (Toledo, 2000). That means that we should rethink, among other issues, how to re-establish the role of rural people's knowledge as a main source of solutions for their productive systems within ecologically sound mental and action frames.

The last two decades of the twentieth century witnessed a growing acknowledgment that indigenous knowledge together with the scientific knowledge of outsiders can jointly develop ways to reestablish harmony in the production of food, while ensuring the conservation and local control of natural and cultural resources. Particularly in the last decade there has been growing support for local practices based on knowledge about agro-biodiversity and recognition of this complex system as a relevant source that can contribute to the enhancement of local cultures as a basis for biological diversity conservation (Escobar, 1995).

These new insights imply a personal shift in the values of scientists or outsiders. They are assessing their own personal ethic as well as their theoretical principles, scientific concepts, and research and action methods in a critical and constructive way. The PTD approach is one of the experiences understood as a learning process vis-à-vis the local versus modern forms of knowledge about biodiversity conservation. It provides the scientists, or outsiders, the opportunity to reorient their skills in order to play a new and creative and role in the generation of knowledge for sustainability.

PTD methods address principally the issue of participation claimed by indigenous people: they want to be heard and considered as subjects in the process of decision-making. If we translate this political demand to our field of action, it means that we as outsiders assume the role of facilitators of a process of interaction with indigenous people in which they are the main actors in the expression of IK, the identification of promising ideas of experimentation, and the last word to decide about the necessary activities to keep the ideas alive over the long-term.

FACILITATION:

Refers to organization of favorable conditions for a productive dialogue between different forms of knowledge with the goal of arriving at a common understanding of ideas that will help villagers to make free decisions about the local resources without losing control of them.

SUSTAINABILITY:

or sustainable development, extends out of the growing awareness about environmental problems affecting the planet: population, food security, loss of species and genetic resources, energy, industry and human settlements.

It contains two key concepts: *needs*, especially those of poor people and *limitations* of technologies and organizations regarding the capacity of the environment to satisfy present and future needs. It has to do with both reshaping human needs according to a growing consciousness of environmental capacities and creatively meeting these needs while reviving and enriching the environment and its capacities. In the context of PTD we use this concept as a vision towards sustaining human life now and for the future generations ([Mitchell, 1997](#)).

2. THE USES OF PTD

The PTD approach facilitates the generation of local innovations. It has a wide field of applications besides agronomic research. It develops new technologies jointly with farmers, and as a discovery process it can be used in any technological field in both rural and urban development.

The basic condition of PTD is reliance on the capacities of local people: they are experimenters by nature and possess creative skills to generate innovations (with or without external advice). PTD is not meant to support the expert's knowledge alone or to give orders or instructions to the farmers about how to conduct their farms. That is the "transfer of technology" approach, a top down paradigm that we want to replace with PTD.

This manual focus on a specific use of PTD:

IDENTIFICATION, ACKNOWLEDGMENT AND RECOVERY OF INDIGENOUS KNOWLEDGE TO IMPROVE LOCAL LIVELIHOODS AND TO ENHANCE BIODIVERSITY

Improvement of local livelihoods means generating innovations which:

- are based on indigenous knowledge, ideas and practices
- recover and improve the quality of life in the countryside

- have gender balance or especially benefit rural women and children
- avoid pollution-producing farming techniques
- provide healthy products and food security for subsistence, exchange and market, giving also benefits to the urban consumers
- reinforce indigenous culture and local identity
- support existing social organization and cohesion
- are sustainable by creating an innovation capacity of local people

We see these criteria as going hand in hand with the enhancement of biodiversity by

- reinforcing diversity of seeds
- recovering old seeds
- strengthening the amount of different wild species
- creating multi-cropping instead of monocultures
- stabilizing and diversifying ecosystems (especially agro-ecosystems)

This focus characterizes our field manual. It is addressed towards technology experimentation with indigenous people in Southwest China. Therefore we provide here a set of tools which we have selected for this purpose. They are not new. They may overlap with the tools of PRA or other participatory processes, except that PRA tools are applied to develop a situation analysis and to plan development work with local villagers. With the perspective on indigenous knowledge and biodiversity in mind, you have to adapt this approach in your own working context. Individually or as a set, the PTD tools are not a blueprint, they have to be adapted to the local context.

3. FAVORABLE CONDITIONS FOR THE APPLICATION OF TOOLS OF PTD

In a participatory process our role as outsiders is to create a favorable setting in which the expression, representation and exchange of knowledge can take place. For that purpose the following tools are useful if applied properly. Proper application requires clear understanding of the characteristics, potentials and limitations of the tools. The PTD tools are applied using the following procedure in the subsequent format.

PROCEDURE

Normally the facilitator arranges an agreement with the community leaders about the PTD procedure and then applies the tools working with individuals from the

community according to the participatory process. Often we deal with an indigenous specialist, knowledgeable person or community leader, either man or women, and with this person we will discuss one specific topic using visualization tools to help the person to express him or herself. The application of each tool requires the following process, as extended from an ethical basis:

1. Warm-up or introduction

The PTD-facilitator introduces himself and the individuals working with him, the purpose of visit, and the interest for dialogue on the topic.

2. Explanation of the purpose of the tool

The facilitator explains the expected outcome, showing respect towards the resource person's knowledge. Both agree on a time framework and purpose.

3. Visualization of IK and application of the tool by the farmers

Each tool has its own logic, but the basic purpose of all tools is to stimulate the expression of the resource person. This requires using open questions like *how*, *where*, *who*, *when*, and *what* and recognizing feedback like *how* did you achieve these skills, *when* did you learn, *how* did you obtain this seed, and so forth.

All tools are based on visualization. Let the person draw, graph, and sketch their ideas by her or himself. Don't contribute too much direction in the drawing as you may influence its expression, form, and content.

It is important for the facilitator to form his or her own opinion on a subject by reading beforehand about the area or the topic, by discussing with local people, and by observing prior to and during the application. For local people many things appear to be normal or natural, while the outsider's eyes may see something strange or new which could evolve into an experimentation or innovation or provide a better description than provided by the indigenous knowledge.

4. Dialogue

While the tool is evolving step by step, you continue asking questions about the topic and memorize carefully some significant expressions of the resource person or specialist. Not all expressions get visualized, but they may powerfully summarize a situation or historic moment. Therefore engagement in dialogue and mutual reflection is a major objective of PTD. The tool just provides a medium as a means to develop dialogue and to help to understand a situation or topic.

Be aware to not put answers into the mouth of your partner by asking suggestive questions, because it may be misleading or lend priority to secondary issues.

5. Presentation of result by the farmers

Once finished with the tool, the farmer will present the result to members of the community or neighbours to create a common understanding of the situation or topic and to clarify some of the local concepts.

6. Reflection and conclusions

When the previous steps are finished, then summarize briefly the outcome and ask for comments and conclusions with regard to the topic and the tool's application. Register carefully the conclusions and comments, like harvesting fruit after a long growing season.

THE ART OF THE QUESTION

Formulating questions is an art if you want to achieve a dialogue and mutual understanding with your interview partner or resource person.

Questions which contribute to dialogue	Hindering questions
<ul style="list-style-type: none"> Ask open questions, which stimulate the resource persons to explain and display their knowledge. Open questions start with what, how, which, where, when and elicit new information. 	<ul style="list-style-type: none"> Closed questions, as they lead to answers like yes or no, stymie dialogue. Insult the resource person by pre-supposing the answers in the questions.

(Continued)

Questions which contribute to dialogue	Hindering questions
<p>Respect the ideas and values of the resource person, so that he or she feels enhanced and recognized.</p> <p>Acknowledge the ideas of the other person and give positive feedback on what you have understood.</p> <p>Use the local language or express yourself in clear terms, so that you can clarify the topic you are asking about.</p> <p>Ask for the local terms (in the local language and dialect) and their meaning, as they contain the details of indigenous knowledge.</p> <p>Ask for clarification of the answers, so that more details and clear description result in the visualized tools.</p>	<p>Make negative judgments that destroy partnership.</p> <p>Relate to confidential aspects of the resource person which she or he is unwilling to talk about (conflicts, family problems, private things)</p> <p>Ask suggestive or guiding questions which already include an answer as they may narrow down the range of responses and possibilities.</p>

FORMAT

1. *Graphic (on big white paper)*. The following information needs to be written on the sheet accompanying the graphic:
 - Name of the technique (tool)
 - Name of place
 - Date
 - Name of resource person(s), age(s), and gender
2. *Notes (in your field book)*
 - Observations of the interaction process
 - Conclusions of the interview partner
 - Key words of topics and ideas emerging from dialogue and reflection
 - Feelings of the interview partner about the process of the tool

- Conclusions of the interview team members
- Time duration (beginning and end)

4. THE TOOLS OF PTD AND THEIR DETAILED DESCRIPTION

THE TOOLS OF PTD

- | | |
|-------------------------------------|-------------------------------------------|
| • Historical Diagram | • Biography of Local Knowledge Specialist |
| • Social and Resource Mapping | • Interview of Farmer Specialists |
| • Transect Walk and Diagram | • Memory Banking |
| • Seasonal Calendar and Daily Cycle | -Life History Matrix |
| • Matrix of Crops, Fruits, or Trees | -Landrace Technical Sheet |
| • Diagrams | -Seeds of Life History |
| • Drawings | • Triads of Seeds |
| • Ethno-Taxonomy | |

HISTORIC DIAGRAM

As the name already tells us, the historic diagram is a tool to learn about the conception of time in indigenous knowledge. We can approach a variety of topics with this tool: the perception of local people about important events in a village, changes in agriculture, the village organization, crops and their varieties, technological changes, introduction of chemicals, migration, the age of seeds, the history of the resources, and so forth.

The historic diagram shows the perception of historic events that the resource person can remember, including the stories heard from the elders.

Some considerations:

It is important not to force exact dates under the column of time. Leave it up to the villagers to set up their own chronology.

We should talk with elderly people, not just the young. Make a point to also ask women, because they have a different point of view of history and will often not come forward.

We should try to understand the relationship between indigenous knowledge and the history of external innovations by putting them in separate columns.

If there are difficulties in drawing some events (for example the Cultural Revolution), create a symbol or simply write it down.

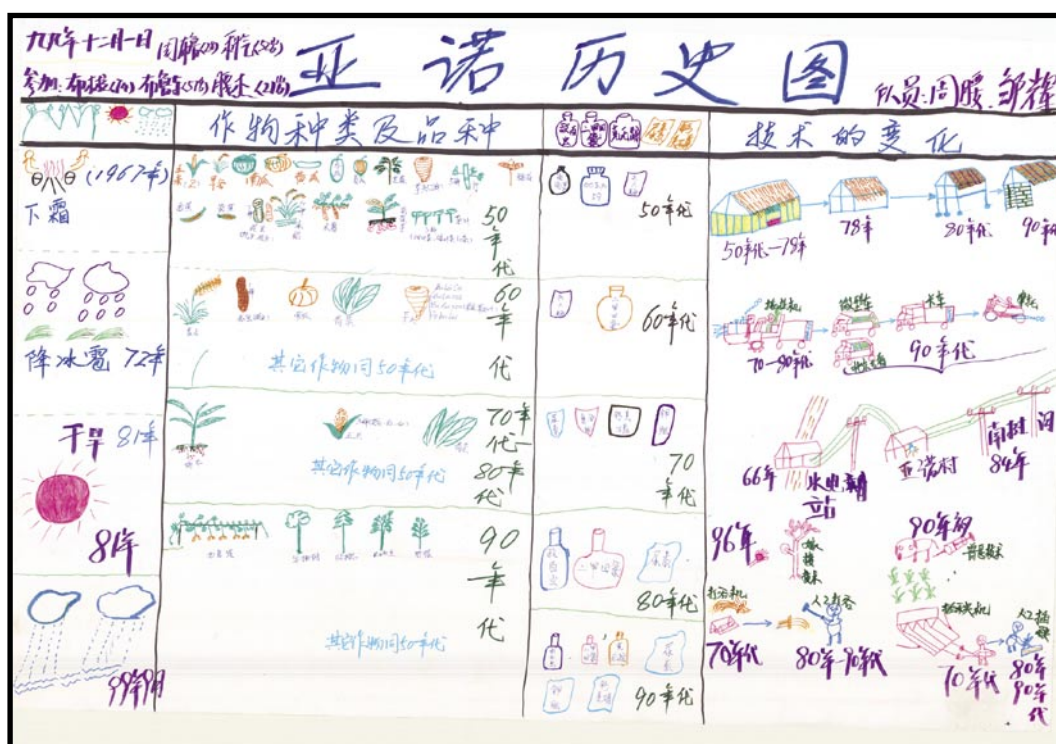


Fig. 3.1 The historical diagram of Yanuo village shows clearly the introduction of chemicals into the agricultural production as well as the reduction of crops since the 1950s.



Fig. 3.2 This detail of the historic diagram of Yanuo village illustrates the changes of agricultural crops in the last fifty years and which plants and trees have been introduced.



Fig. 3.3 This detail of the farmer's drawing portrays in detail the changes and evolution of housing, transportation, electricity and agricultural techniques and tools.

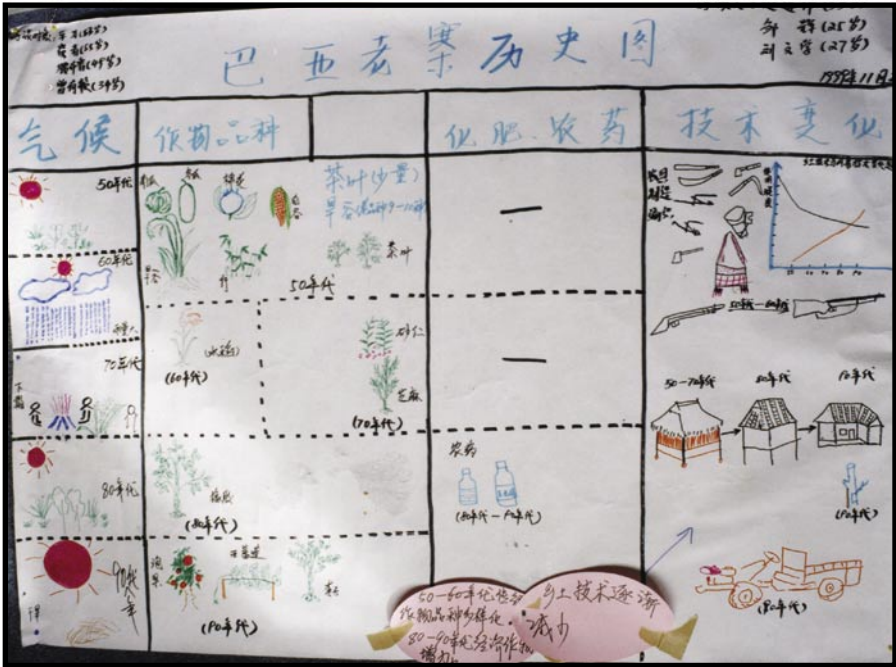


Fig. 3.4 Above, the historical diagram of a Jinuo-Village represents the perception of the farmers about climate changes (the increasing effect of drought in the recent years), the introduction of rubber in the 1980s, and the evolution of tools, houses and machinery.

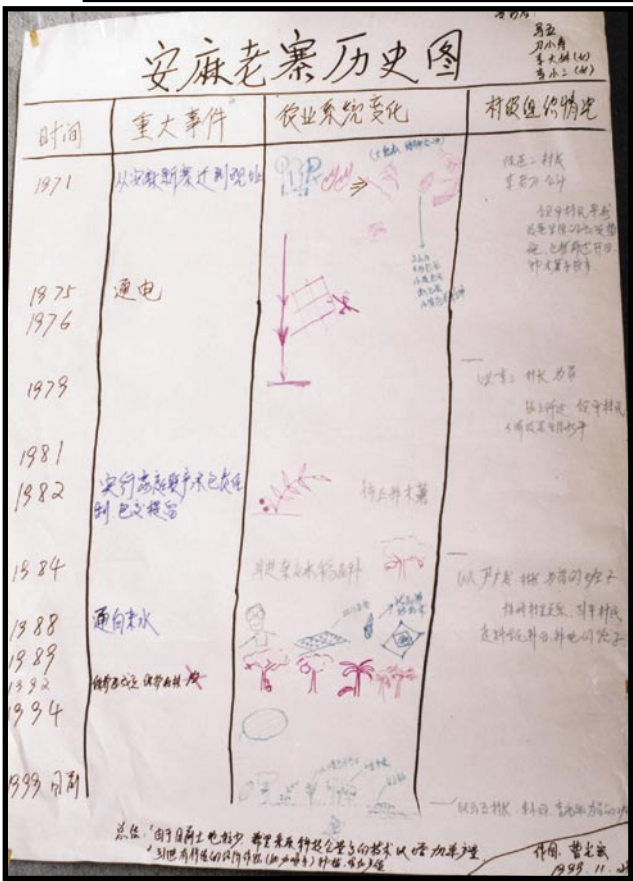


Fig. 3.5 Left, the historical diagram of Anmalaozhai (a Lahu village in Naban-Valley) emphasizes the change from shifting cultivation with a diversity of crops to permanent agriculture and use of high yielding varieties with the application of a package of chemical fertilizers and pesticides, aiming for higher productivity.

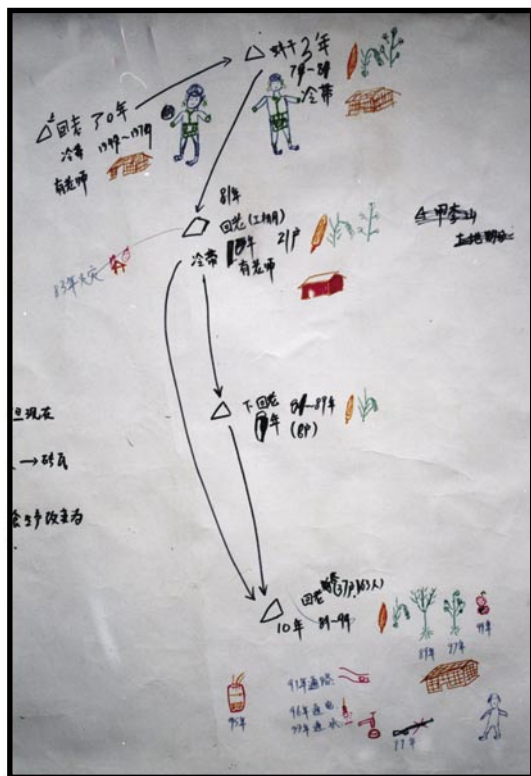
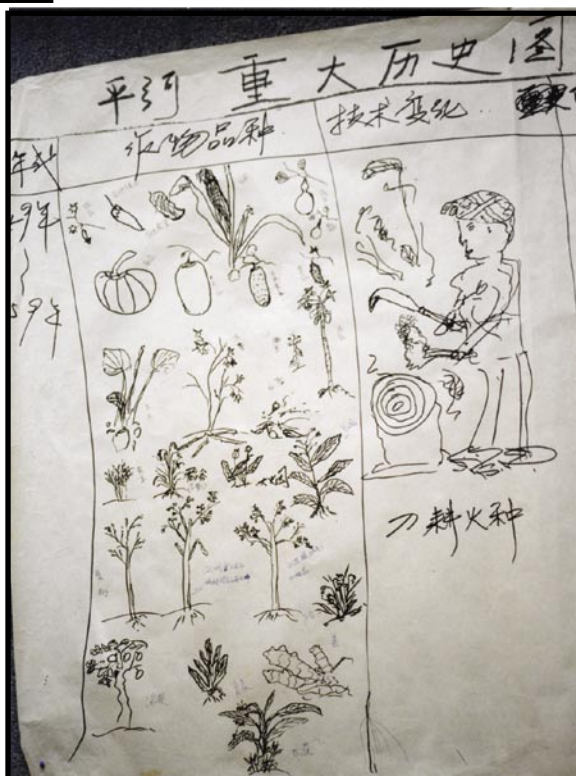


Fig. 3.6 *Left*, this historical diagram of the Lahu village in Huilaozhai is the account of the migrations and resettlements of the village during the last 20 years. The Lahu have been resettled from a mountainous area (now a nature reserve) down to the valley and made to adopt rice agriculture with paddy fields. The traditional hunting and gathering of the Lahu is seen as something left in their past, and they are obliged to change their livelihood into permanent agriculture.

Fig. 3.7 *Right*, the Yao village of Pinhe in Mengla County moved 50 years ago from a mountain setting to a plains area. Shifting cultivation provided a high diversity of crops and food. Now the farmers mix sugar cane, rice paddy and fruit trees. The women provide a great variety of vegetables and medicinal herbs from their home gardens. In less than one hour we collected more than 60 different plants from the home gardens which are planted and used in the local diet.



SOCIAL AND RESOURCE MAPPING

These tools provide the possibility to learn about local perceptions of space. Some interesting topics that deal directly with the use of space relate to the resources in the village. They show us the home garden, land use at community level (forests, shifting cultivation, economic crops, paddy fields, dryland crops), map of village specialists, the pig-raising activity, the village resources, sacred places, sacred groves, distribution of terraces and their uses, and so forth.

If we look at the housing pattern and at social criteria such as poverty, social functions, specialists, house construction, family sizes, etcetera, then we deal with a social map. If these encompass the entire area of a village, watershed or even the household level to describe the land-use systems, cropping patterns, resources availability in the community, then we are dealing with a resource map.

Some considerations:

We should be very open in defining the topic of local ways of using space, because in many cases it is linked to sacred mountains, sacred forest, sacred stones and so forth, which reveal a conception of space not only in terms of material resources but as a wider scope which includes the spiritual dimensions of the resources. This is part of the understanding of nature of local people known as “sacred local geography.” Since local people have been castigated as being superstitious for talking about the tree spirits or the worship of plants and animals, these themes require particular respect. For them the spirits are real and alive.

A bilingual villager needs to be found who can help with the translation of the names of mountains, lakes, rivers, stones, plants, and so forth, and their names in local language. This is a way to bridge the knowledge of the older villagers with the young ones and to overcome our language barrier.

Since mapping is a complex task of shared knowledge among local people, we can give the villagers the time they require to finish without our presence and let them discuss it by themselves. We can return the next day to complete the process of reflection and conclusions.



Fig. 3.8. The social map of Guangming, a Hani village in Mengsong, was completed by a group of women of the village. The social map indicates 15 indigenous specialists related to local livelihood and resource management. Socioeconomic data such as family members and social relationship within village are also illustrated visually.



Fig. 3.9 The social resource map of Pinhe Village offers many different dimensions, from entertainment to social life and available technology, a census of household members and also the spiritual and sacred forests of the village.

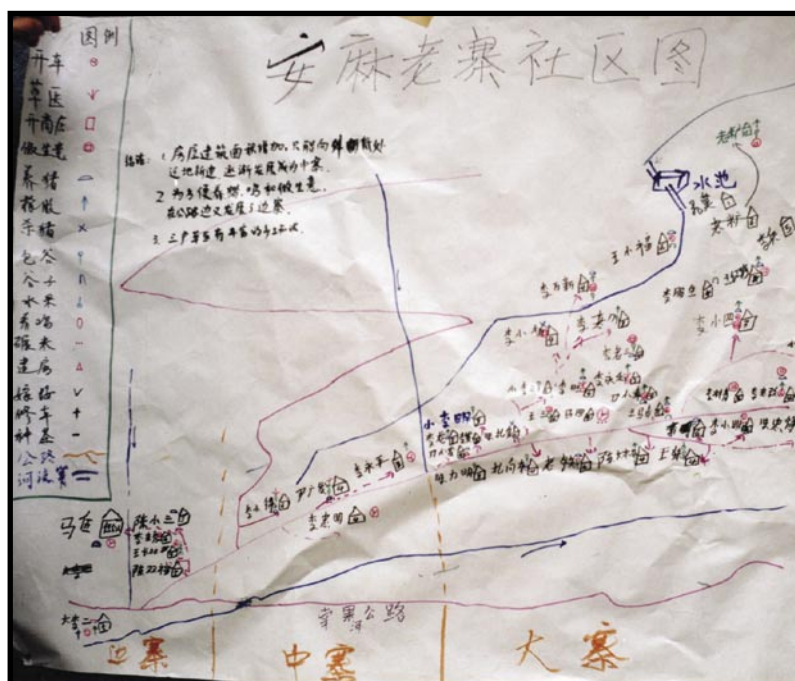


Fig. 3.10 *Left*, the map of Anmalaozhai provides details of all indigenous specialists in the community. There are tea farmers, pig butchers, corn growers, a miller, grafter, etc. It is an entry point to continue with specific interviews about indigenous knowledge on specific topics.

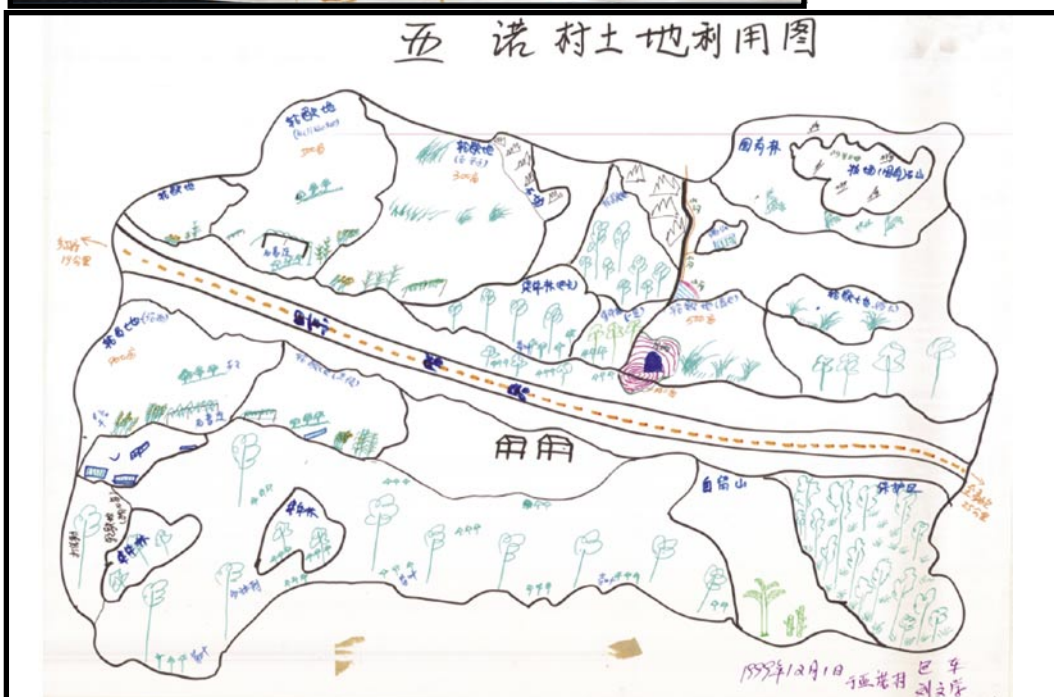


Fig. 3.11 *Above*, the land-use map of Yanou Village provides an excellent starting point for identifying the different land-use systems, differentiating the indigenous knowledge within each system, finding out the most knowledgeable farmers (male and female) in the village with regard to a specific system, and selectig experiments for an action plan. One map is like a whole book, but visualized and easy to understand

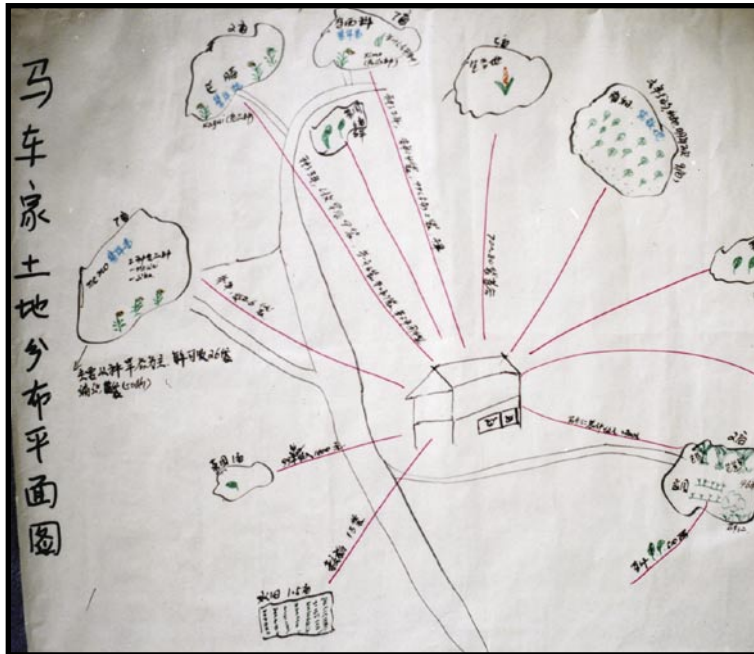


Fig. 3.12 A diagram of the flow of resources of one household (here in Yanuo Village) explains in one drawing the diversity of resources and land used by the family in production (for market and consumption).

TRANSECT WALK AND DIAGRAM (PHOTO)

The transect walk and diagram is also a tool dealing with both indigenous categories of space and the local conception of time. It requires skillful allocation of a great facilitation effort on your part and many hours of the time of the local people to draw on paper so that their knowledge is represented in the chart.

The transect walk and drawing is a two-step process:

First a transect walk between two distant points on the village land (from the upper part of forests to the lower part of paddy fields traversing all different production zones). During the walk guided by one or two villagers, we observe the land use, discuss its potentials, and register in our notebook or keep in our mind interesting topics.

Second, using the guides we draw the transect and divide the profile of the landscape into different agro-ecological zones (nature reserve, collective or private forest, village area and home gardens, upland agriculture, paddy fields, etc.). In a matrix below the drawing, the resource persons fill in their knowledge and criteria about soils, crops and seeds, humidity or climate differences, technologies used, chemicals, gender division of labor and resource use, products for consumption or markets, and so forth. During this process of filling out the transect diagram we recall our observations during the transect walk.

Topics:

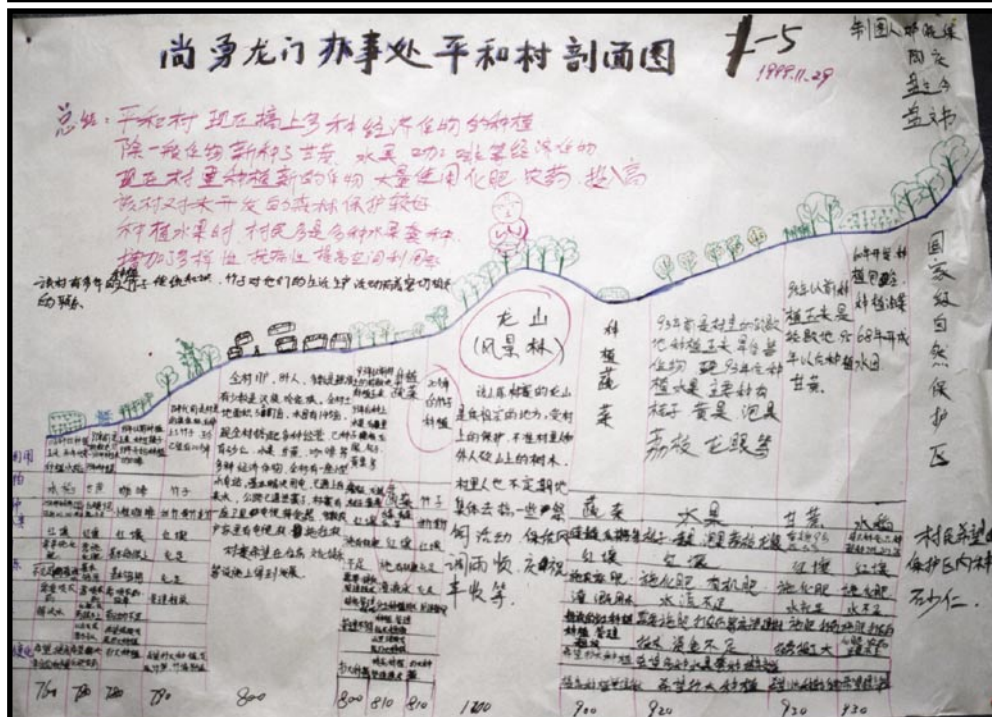
Ecological zones, land use and vegetation, biodiversity hot spots, sites of endangered species, altitude ranges, distribution of crops, problem areas identification, areas of greater potential, distribution of villages, property systems, forest cover, types of technology, terracing system with water distribution, areas to make experimentation, and so on.

Considerations:

If we have the feeling that the villagers are not co-operating well with us, it might be due to this being our first time in the village and our inability to cope with the amount of information that the villagers provide. It could also be that we have not introduced ourselves and the purpose of applying the tool properly. As a result, the villagers cannot figure out what it is *for* and *why* they are having to do all the walking and drawing.

Any attempt to draw the transects by ourselves is impossible, because we have little knowledge of the village and our perceptions of it differ from shared by the villagers. Local people live there, they know about their village and their resources better than anybody else. If they perform the transect diagram, it is an authentic source of information. If we do it, the transect has no local knowledge value.

The relationship between the transect and indigenous knowledge can be reached if we create the necessary confidence in the villagers so that they present their perceptions of their environment according to their own linguistic and graphic categories.



Chapter Headings

SEASONAL CALENDAR AND DAILY CYCLE

The seasonal calendar and daily cycle is another tool for dealing with the perception and management of time. Depending on the combination of topics, it can yield a complex type of information. It is important to establish the period of time: one day, daily, six week, monthly, year, seasonally, seven-year cycle or any other time framework that local people express. For example: food intake during the year or a day, the cycles of the weather, daily agricultural activities or work and festivals during the year, use of forest resources during the summer, periods of time when the cattle are taken to the upper grasslands, the cycle of shifting cultivation, harvesting of different plants in the vegetable garden, or in the fruit garden, how to deal with the climatic changes during the year or in seven years, the differences of growth and labor between landraces and high yield varieties of seed, and so on.

A seasonal calendar can be presented either as a wheel or as a bar chart.

Considerations:

The process of how a seasonal calendar is constructed reveals indigenous categories of time management. The graphic results and the amount of information should be balanced as both are important indicators of Local Knowledge. It tells us what time means to local people, whether linear, cyclical or some other conceptualization, and how they use it to achieve their purposes.

The local people determine when their time starts: the daily activities start at dawn, but the time may vary between men and women, or between different areas; the yearly calendar starts with their own New Year, or with the time of preparing the land for sowing, or with clearing a space, or with prognostics of weather and selection of seeds.

Language should not be a problem when the villagers refer to certain activities of the year using their own terms in their local languages. It is important to look for translation help on the spot and register them for further explanation. On the contrary, the use of local terminology by the villagers should be an opportunity to learn more about Indigenous Knowledge.

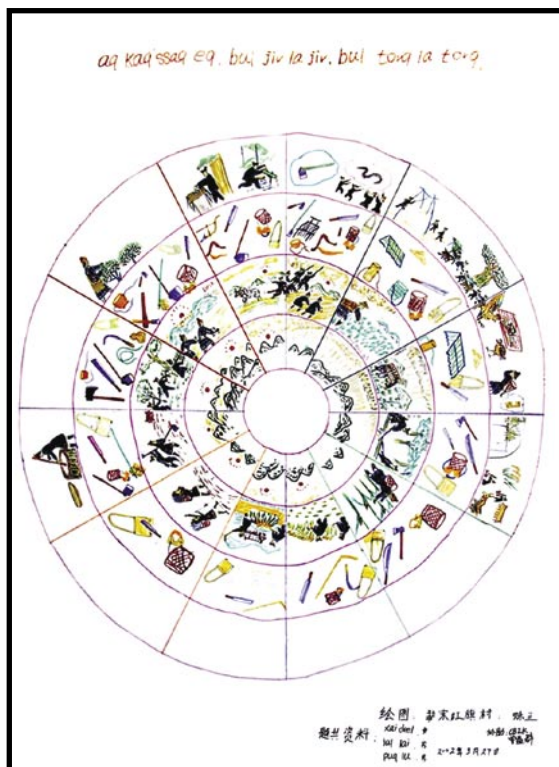
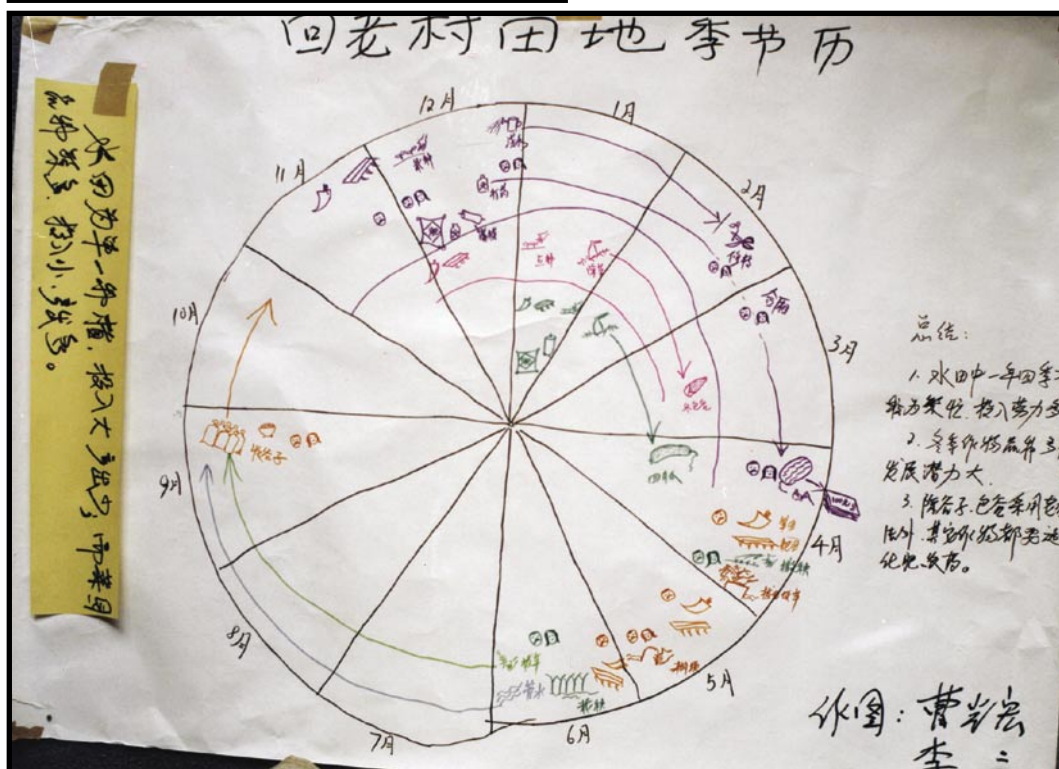


Fig. 3.15 *Left*, the seasonal calendar can be done with drawings of the plants and products as well as use of the leaves or the seed of plants themselves.

Fig. 3.16 *Below*, the seasonal calendar drawn by men of the Lahu village of Huilao helps to determine the workload and technology of the farmers.



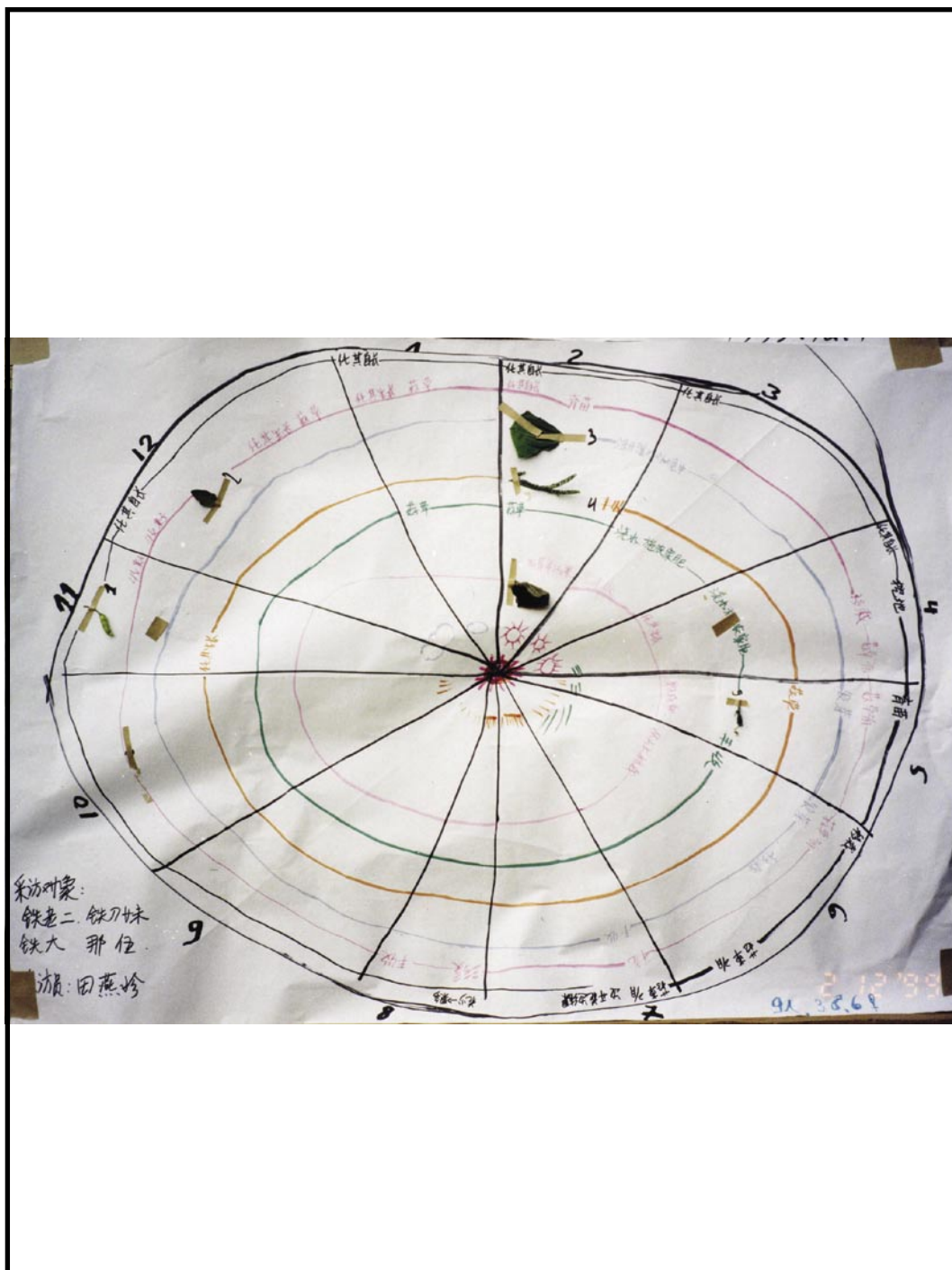


Fig. 3.17 While the home garden seasonal calendar provides clear information about the diversity of plants and tasks during the whole year, at the same time it shows the low tillage technology of the Lahu women, who have adapted their forest livelihood to the home

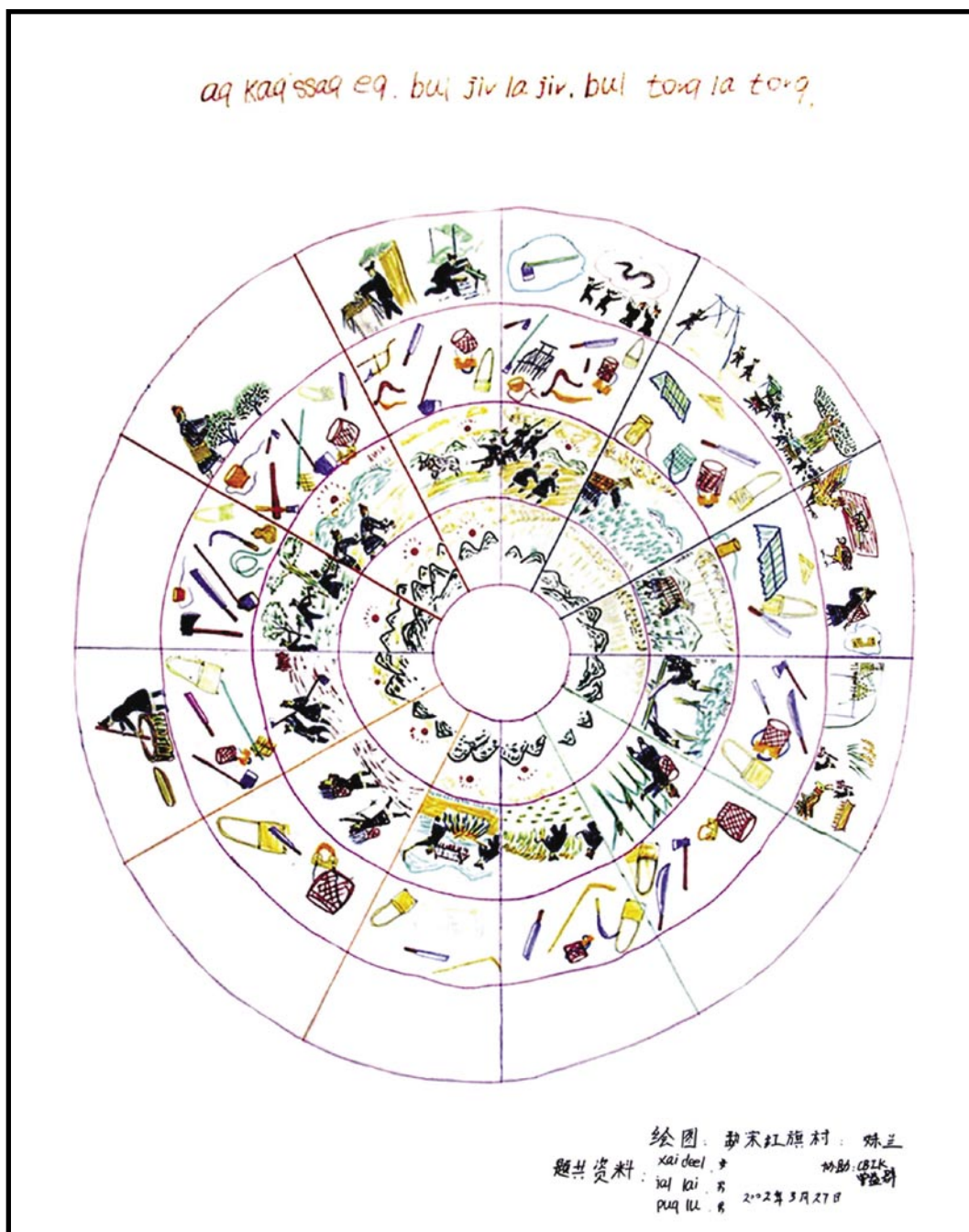


Fig. 3.18 The Akha calendar from Mensong, Xishuangbanna, is the monthly description of all activities of the Akha farmers and shows the careful relation between human beings and nature, the measurement of time, the understanding of climates during the different seasons of the year, the use of a diversity of tools and the rich culture of shifting cultivation.



Fig. 3.19 The Naxi Calendar from Daju in Lijiang is an account of the multifold activities of a Naxi family in the mountain areas. Agriculture, soil characteristics, climate, tools, forest uses, workload for men and women, even the time for traveling and involvement in exchange activities is indicated.

MATRIX OF CROPS, FRUITS, OR TREES

The matrix of crops, fruits or trees is a tool with a simple structure of two entries, a horizontal line and a vertical line. To allow the local villagers to express their preferences quantitatively, the establishment of the ideas or criteria on the vertical and horizontal lines, as well as the quantification procedure, should come from the villagers. Local people express their preferences relating the vertical with horizontal information step by step. Possible topics include a list of crops and different types of technology, order of preference of fruits or trees, the curative value of a list of medicinal plants, the most endangered grassland varieties, the best rice landraces, the benefits of different animals and insects to the home gardener, biodiversity in the swidden fields, the most promising local experimentation and so forth.

Considerations:































The matrix is a time consuming tool in spite of the simplicity of its structure. A good result takes several hours to facilitate. Therefore we should never start a process of elaboration of a matrix if the villagers are working at other tasks. It is best to choose an appropriate moment and a topic that is relevant for them so that they have a rewarding feeling of having learned something when their matrix is done.

Indigenous knowledge is rich, complex and dynamic. Therefore we should not think that a matrix contains a complete domain of indigenous knowledge. For example, if we select the topic medicinal plants, the matrix yields a limited number of names of the plants and some of the common or preferred local uses for healing some diseases. Such information is a starter for discussion and reflection and it provides a basis for continuing with a systematic investigation of the topic.

Sometimes the local villagers do not want to draw or write on the matrix because the use of a big sheet of paper is unfamiliar to them and they consider paper as a valuable resource. In that case we can facilitate the elaboration of the matrix by taking over the writing or drawing of their ideas. We should give attention and special care to writing exactly what they say, so that the matrix conveys indigenous criteria and preferences.

The most common errors in constructing the matrix derive from failing to understand its characteristics and undertaking it without systematically following the instructions. This can be avoided by reading or rehearsing the steps involved in the elaboration of a matrix in this or other PTD books.

[illegible]

芭蕉 冰霜 李响 大笋	包菜 菜根 青菜 芹菜 菜叶 子笋 竹笋	     	\$ \$ \$ \$ \$ \$	♀♂ ♀♂ ♀♂ ♀ ♀ ♀ ♀♂ ♀♂	2月—3月 27天 一年四季 一年四季 1月—2月 一年四季 2月—3月 7月—9月 7月—9月
木了树 红毛树 山松花 平头树 海子树 嘴竹 黑竹	       	       	 	♂♂ ♂♂ ♂♂ ♂♂ ♂♂ ♂♂ ♂♂ ♂♂	11月—12月 11月—12月 11月—12月 11月—12月 11月—12月 7月—9月 7月—9月
木了树 炮火柳树 干竹子	   	   	 	♀♂♂♂ ♀♂♂♂ ♀♂♂♂ ♀♂♂♂	11月—12月 11月—12月 11月—12月 11月—12月

The conclusion was that as long as we conserve the surrounding natural resources and prevent fire, the natural resources will continue to be available for our the succeeding generations of our offspring.

安麻老寨用材树种矩阵图

	生长速度	材积量	材积	经济价值	其他
杉木	—	—	—	—	—
红杉	—	—	—	—	—
平头树	—	—	—	—	—
白栎	—	—	—	—	—
奶浆树	—	—	—	—	—
橡木	—	—	—	—	—
木料树	—	—	—	—	—
牛马树	—	—	—	—	—

Fig. 3.22 *Left*, in Amalaozhai (Lahu Village) the farmers classified the growing speed, quantity, quality and economic value of the timber tree species.

Ranking Matrix

Fig. 3.23 *Below*, The ranking matrix gives an immediate impression about the values of the land-use systems with regard to technology, the varieties and species planted, the use of chemicals and fertilizers, and the yield of each field. By this comparative ranking the farmers identify easily in which plots they are using indigenous technology and where they are going to experiment with their local knowledge as support.

土地利用情况	过熟林砍伐	过熟林砍伐	过熟林砍伐	过熟林砍伐	过熟林砍伐	过熟林砍伐	过熟林砍伐	过熟林砍伐	过熟林砍伐	过熟林砍伐	过熟林砍伐	过熟林砍伐	过熟林砍伐
土质	—	—	—	—	—	—	—	—	—	—	—	—	—
技术	—	—	—	—	—	—	—	—	—	—	—	—	—
品种	—	—	—	—	—	—	—	—	—	—	—	—	—
化肥	×	×	×	×	×	×	×	×	×	×	×	×	×
农家肥	×	×	×	×	×	×	×	×	×	×	×	×	×
产量	—	—	—	—	—	—	—	—	—	—	—	—	—

作图：常晓、尹发、李石保、李三
1999.12.1

家畜矩阵打分图

标准	猪	牛	鸡	备注
疾病多	●●●	●●	●●●	
饲料困难	●●	●● 11月	●●	11月
劳动力高	●●	●●●	●●	11月
经济收入高	●●●	●●	●●	
风险大	●●●	●●	●●●	
最想养	●●●	●●	●●●	

疾病：猪瘟、猪链球菌病。一般由村卫生所医生打针。有担心针头不干净不针。

饲料：11月

劳动力：11月

经济收入：11月

风险：11月

最想养：11月

Fig. 3.24 A ranking matrix can provide an easy understanding of the priorities of a technical topic like livestock and raising of animals. In this case one can see the tension of raising animals

DIAGRAMS

A diagram is a sketch, meaning an abstract and subjective representation of a topic that is shared by local people. For example, the multiple uses of trees, the importance of animal resources, the impact of external innovations, what is a local innovation, the process of local experimentation, the market exchange of local seeds, the fruit garden, the inputs and outputs in a household, the main stations of honey production, and so forth.

There are several kinds of diagrams which are named according to the instructions or rules contained in them, such as the Venn diagram, input-output diagram, spider or interaction diagram and so forth.

The diagram of the gender division of labour is done by letting men and women draw the tools and resources they use and know about. It will give a clear indication of the different gender roles with relation to biodiversity and helps to promote the knowledge of men and women in their specificity.

Considerations:

Remember that all the tools dealt with here are just aids for indigenous knowledge research. Even if you apply many tools, the research on indigenous knowledge remains incomplete. These are visualized methods to approach indigenous knowledge and learn about the perceptions, ideas, and experiences that local people have about trees (or other resources) and the multiple functions and meanings that the resources have for the community. The results elicited using the tools need to be further discussed at individual and group levels. After a thorough joint analysis we can come to preliminary conclusions that provide topics for further discussion.

Visualization plays an important role in the application of the tools, because it is the medium with which indigenous knowledge is conveyed. We should improve our skills to facilitate that process using patience, supporting the local villagers with a series of open-ended questions, and creating a mutual learning environment out of the fieldwork.

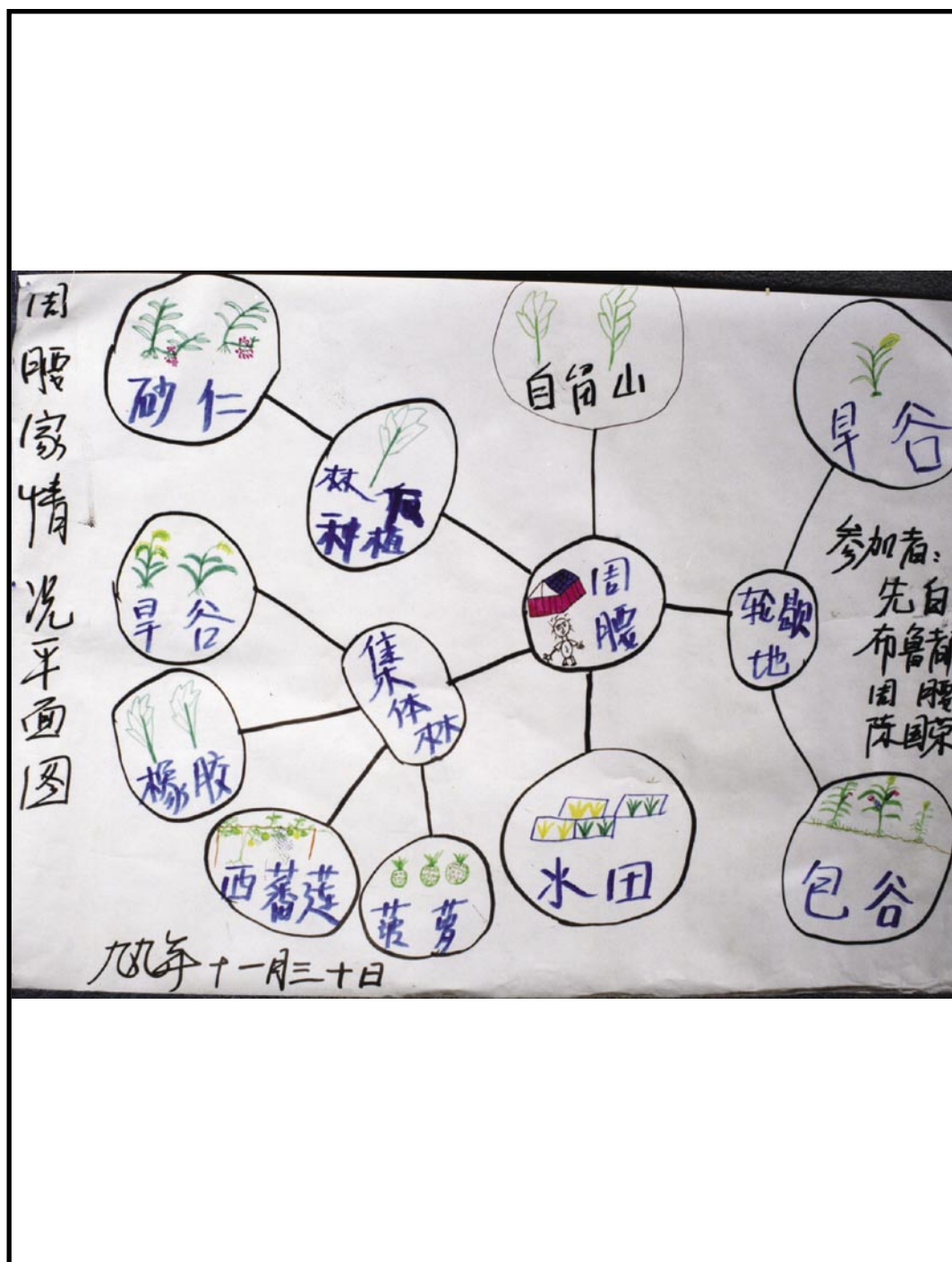


Fig. 3.25 This Venn-Diagram gives the farmers' priorities for their resources. Swidden fields, paddy fields, community forests and other forest areas and mountains provide the food and crops for the market.

TREE DIAGRAMS

These are five multifunctional trees in Huilao Village (Lahu).

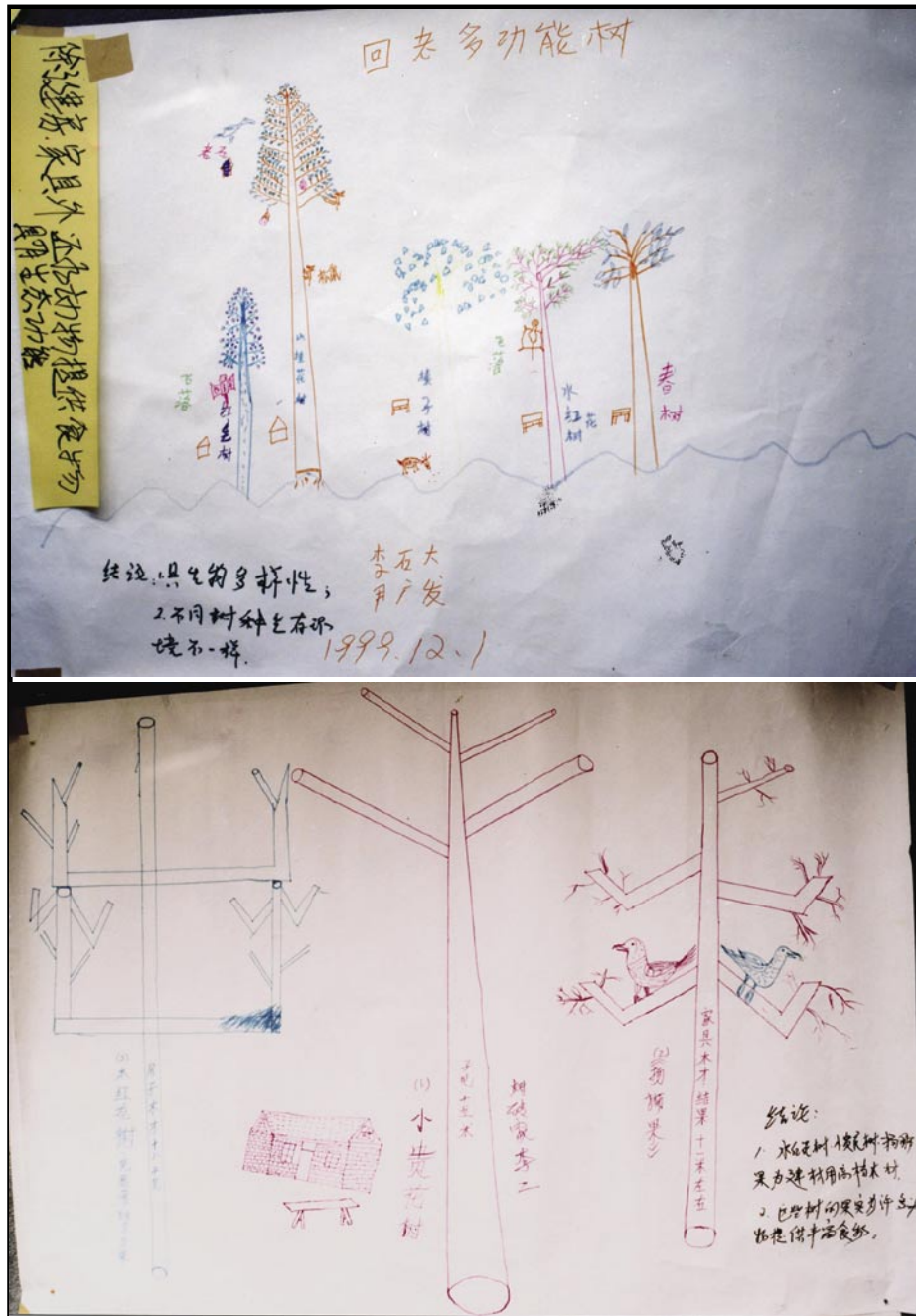


Fig. 3.26 *Top*, trees not only produce timber, they host animals like squirrels and birds. They also provide fruit and oil. Fig. 3.27 *Bottom*, a tree diagram of three different species.

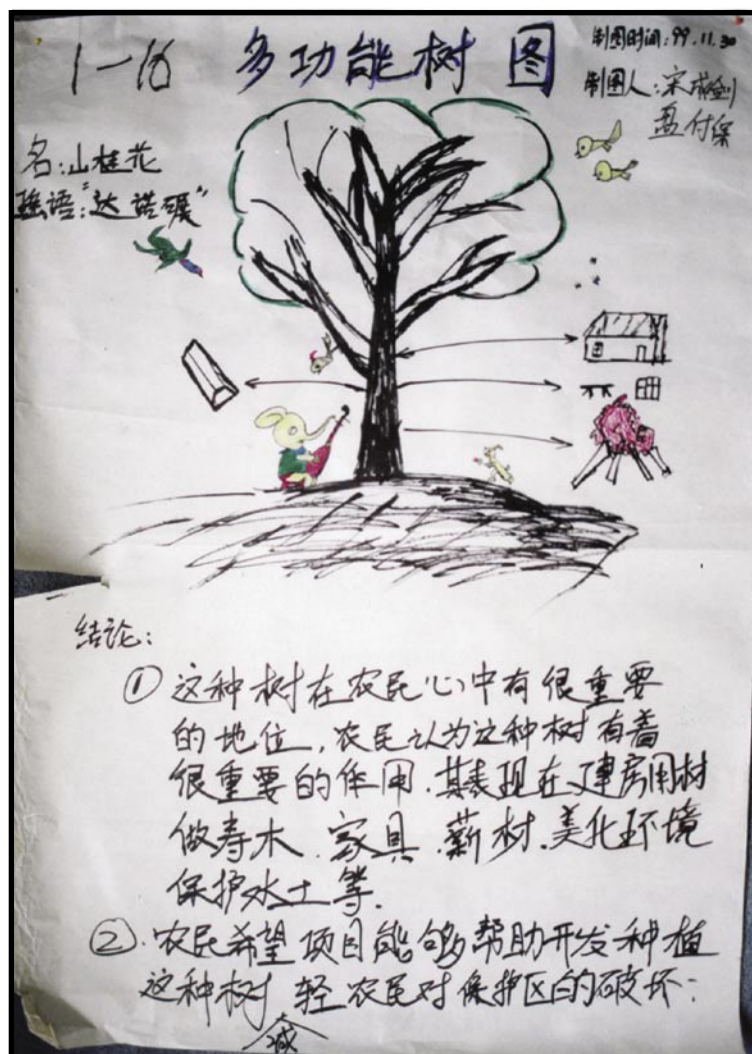


Fig. 3.28 In Yao language this tree is called Da nuo nian (*Paramichelia baillonii* Hu) and is important for the local farmers, because it produces wood and timber for housing, coffins, furniture and firewood, and it can host many animals like birds, insects and butterflies.

With the help of comparison of different trees, the farmers can decide using additional criteria based on their own priorities which trees they are going to plant in the future or which seeds to collect for a local village nursery.

DRAWINGS

The drawing of a concept, story, technology or situation (past, present and future) of a person, household or village is a useful and powerful tool to approach the perception of the local people on the selected topic.

Words can mean different things in our imagination, therefore a drawing describes the idea and language used by the local people. By drawing we can understand better the local meaning of a specific topic and avoid imposing our own images and perceptions onto the meanings of the local people.

Drawings can be made individually (one female or male farmer) or by groups of farmers.

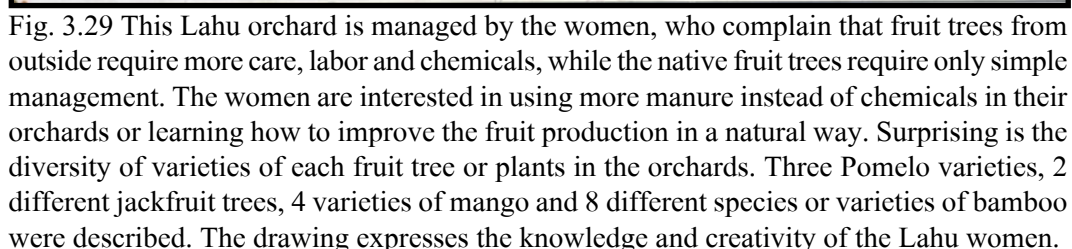


Fig. 3.29 This Lahu orchard is managed by the women, who complain that fruit trees from outside require more care, labor and chemicals, while the native fruit trees require only simple management. The women are interested in using more manure instead of chemicals in their orchards or learning how to improve the fruit production in a natural way. Surprising is the diversity of varieties of each fruit tree or plants in the orchards. Three Pomelo varieties, 2 different jackfruit trees, 4 varieties of mango and 8 different species or varieties of bamboo were described. The drawing expresses the knowledge and creativity of the Lahu women.

Ethno-taxonomy consists of a set of tools to register in a visualized form the categories with which local people classify the stars, seeds, trees, plants, flowers, animals, crops, insects, soils and so forth. There are many procedures to investigate local perceptions of specimens and plant varieties which are important for biodiversity conservation.

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Fig. 3.30 The Yi women, specialists in plants, are invited to display the voucher specimen collected in forest on white papers for different use.



Fig. 3.31 Those plants have been further classified into their own categories. The criteria for classification have been identified also. The specific knowledge of resource persons has been illustrated.



Fig. 3.32 After being invited to collect all the useful plants in the vicinity of the village, these Tibetan villagers, including women, children and old men, stand behind their display of more than 80 species that they had collected within a half hour. All local names and uses are written on the cards. Such collection provides unique opportunities for knowledge sharing, both among villagers and with outsiders. It can also be applied as rapid biodiversity assessment. This exercise can be followed by the semi-structured interview and matrix ranking.

BIOGRAPHY OF LOCAL KNOWLEDGE SPECIALIST

Biography is a tool that expands into the life history of a local specialist and how he or she has acquired, uses and transmits to younger generations a field of specialized knowledge. The structure of the biography is given by the time framework of the specialist (for example, it can be framed by statements such as “when I was young,” “when I got married,” “now that I am older,” or by reference to particular events, though exact dates are also acceptable as desired). It is important to focus on a specialized topic of knowledge like seeds, water management, weather forecasting, pest control, soil classification, diversity of vegetation, sacred trees, livestock, grasslands, and so on. The purpose of focusing on a subject is to reach an in-depth analysis of the knowledge that a local specialist possess.

树专家自传 (李同保老寨)			
时间	关于树的知识	哪里学到	谁受益
12岁 ★	树名: 红毛树, 桂花树, 白椿, 镇子木, 水渠, 三丫果, 干天果, 毛荔枝	大人教给	见者有份
18岁 ★	树名: 平头树, 椴提树, 喂李罗, 红椿, 车树	大人教给	下代
20岁 ★	红毛树, 桂花树, 镇子木, 平头树, 远建村树和别家家具 (红椿, 白椿)	大人教给	群众
27岁 ★	红毛树, 桂花树, 镇子木, 泡田板生长快 (红椿) 可成材, 镇子木, 木丁树, 红毛树, 桂花树长于半山坡, 干旱环境, 白椿, 红椿, 平头树长于全沟, 潮湿环境	自己观察 自己观察	本人 本人

村兄弟般在所生活的环境中学习到许多关于树的知识。

调查者: 李同保 李同保 王建兴

Fig. 3.33 The biography of this Lahu farmer shows the knowledge about trees, from whom he learnt it, and who benefited from this knowledge during the last 20 years.

INTERVIEW OF FARMER SPECIALISTS

In each community, in each indigenous group living in a particular environment, there are knowledgeable persons who have acquired a detailed and vast knowledge through learning from the elders and through their own experiences and experiments. This knowledge can be related to seeds and crops, to agricultural systems, to collection and use of natural resources, to nurturing nature involving skill and spiritual practices. It can be knowledge in wildlife, plants, medicine, crops, soil fertility management, and so forth.

These specialists prefer to minimize risks rather than maximize profits; they are generalists and have knowledge in agriculture, forestry or medicine; they have holistic views and believe that everything is interrelated; their knowledge is based on their cultural beliefs and practice systems. For these reasons, local indigenous

specialists are the best conservers of indigenous knowledge and the cultural aspects of knowledge systems.

The interview with a farmer specialist is in-depth, based on a series of guiding topics or questions. These questions are not handled in the manner of the question and answer format of questionnaires, but through a dialogue that follows up the different questions, develops details, and allows excursions on the way. The following eight questions, each followed up with additional queries and leading to unexpected topics and issues, allow development of an understanding of indigenous knowledge. It requires time to do it.

1. *Who* is the specialist, name, age, sex, civil status` ?
2. *What* is his/her special field of knowledge on biodiversity conservation?
3. *Where* does he/she apply the knowledge?
4. *When* does he/she apply the knowledge?
5. *How* does he/she apply the knowledge?
6. Why does he/she apply the knowledge?
7. *From whom* did he/she learn the knowledge?
8. *To whom* does he/she will transmit the knowledge

This interview will be visualized into a historical diagram, a resource map and a seasonal calendar focused on the special field of knowledge.

MEMORY BANKING

The memory banking approach was developed by Dr. Virginia Nazarea with ethnic groups and their knowledge on sweet potatoes in the Philippines. It involves recording information from people who know and remember about land races. It is a systematic documentation of general information on seeds and landraces. The following three tools belong to this category: life history matrix, landrace technical sheet, and seeds life history.

LIFE HISTORY MATRIX

The life history matrix establishes the relationship between the life of a specialist and the history of seeds and varieties (based on [Nazarea et al., 1997](#)).

Guiding questions:

What kinds of crops, fruit trees or vegetables do you have on your land, in your garden?

How are the kinds you plant now different from the kinds you used to have?

How did farming or gardening change from the time of your youth to the present?

What were the sources of seeds and other inputs then and now?

How did you and your parents prepare and store your product then and now?

LANDRACE TECHNICAL SHEET

The farmer, who has grown a certain landrace over many years, is interviewed about the seed. This tool should be applied especially during the seed fairs, which gather a number of peasants who exhibit their products, crops and especially the variety of their seeds, which afterwards can be exchanged (based on [Nazarea et al., 1997](#)).

Common name:

Botanical name:

Seedsaver's name:

Characteristics of seeds:

Site (village, township, county, prefecture, province):

When and from whom acquired and how:

Years grown on site:

Habitat: (soil, climate, growing season)

Combination with other plants:

How is it cultivated:

Uses:

Characteristics of products:

Histories linked to this landrace:

Cultural practices related to this landrace:

Date:

Collector:

SEEDS LIFE HISTORY

The seeds life history matrix consists of an interview with a person who has a garden with a great variety of plants. The interview is structured by a matrix with following items from left to right: (a) the name of varieties grown in the garden, and (b) one-by-one characteristics of the plant (for example, tasty, fragrant, easy to cook) (based on [Nazarea et al. 1997](#)).

From top down: The period in the life of the informant in which he remembers the plant

	Names of Varieties Grown	Description of Unique Qualities of Seed(s)	How Varieties were Cultivated (when, where, why and how)	Uses of Varieties
Childhood and youth				
Maturity				
Old age				

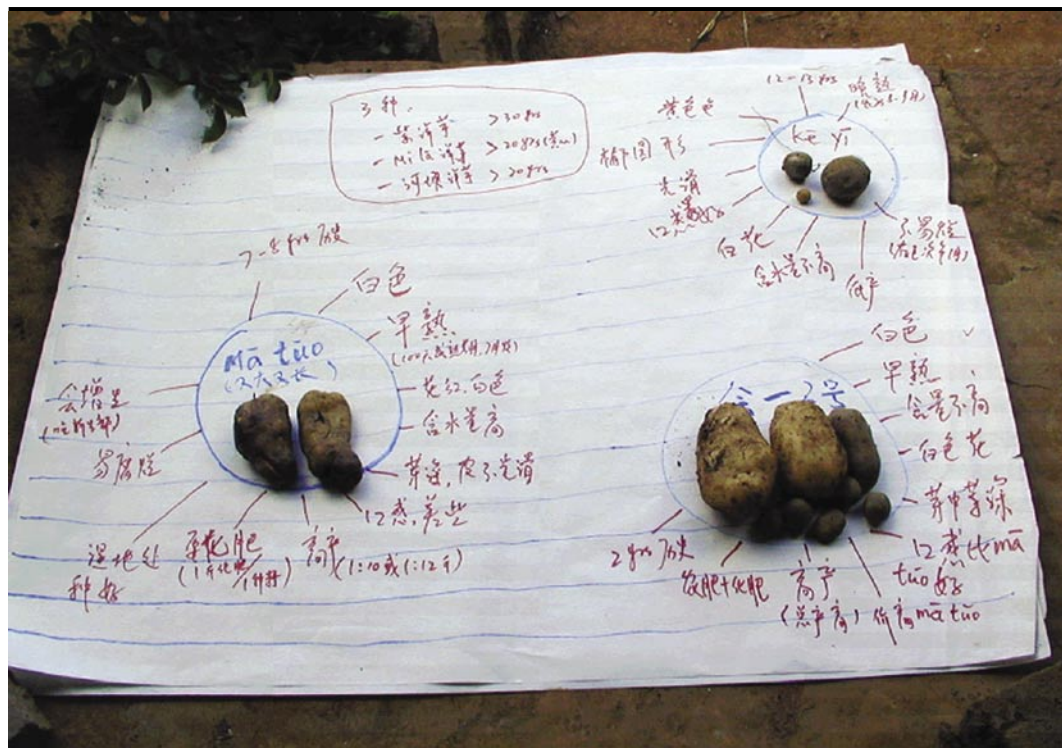
TRIAD OF SEEDS (PREFERENCES)

A useful tool for eliciting ethno-taxonomy is the set of triads. As indicated by its name, it is a form for examining three different plant or seed varieties of animal specimens, or soil types, or any other topic by asking the local villagers: (a) which one of the three (seeds, plants, soils, etc.) is different from the other two? (the item should be isolated); and (b) what are the differences? All the answers should be visualized from the point of view of the local villagers.

Local classification tree: this method requires at least three different varieties. The interviewer asks which one of the three varieties is different from the other two and why?

Considerations:

Write down the criteria the person uses to discriminate between the plants (it could be size, odor, uses). You simply document what the person says, and at the end you will see what characteristics are important in the conservation of these seeds.



5. RULES, TIPS, AND ETHICS

Our manner of application of the tools has a three-dimensional complexity. This will be revealed in our behavior. The dimensions of the rules deal with mastering what are the possibilities and limitations of the tools. In other words, we should know what type of information can be triggered by each tool. For example, an historical diagram will allow local people to structure three or four components of the way they perceive important events in the village. Or a transect will create the possibility for local people to order their spatial perception of their environment.

Each tool has the capability of exploring local peoples' specific ideas, perceptions, and preferences about time and space, but we should be aware of their limitations as well. A matrix, even if it contains a very long list of plants and animals, does not exhaust all the knowledge that local people have about flora and fauna. The tools give realistic, authentic, subjective, qualitative and quantitative information about a portion or aspect of local perceptions, ideas or experiences, but it is not a complete picture of local knowledge.

For that purpose a tip is to count on using a repertoire of tools to cover a relevant span of knowledge from at least three different points of view. Another tip is to rehearse the application of a tool with yourself or work mates first and then use it with local

people. It will make you feel more secure with the technicalities and steps of using the tool: what to do first, second third, and how long. You will also know from your own experience how it feels to be asked questions and to give responses to certain questions. Local people will feel similarly.

THE ETHICS

The Do's and Don'ts	
Do's	Don'ts
<p>You are a guest of the local people. Behave as a guest. Respect the people and their privacy.</p> <p>Show your interest for local customs. People will be happy to show them to you if you show your interest.</p> <p>Accept invitations for drinking hot water, tea or eating local food, but be reserved and do not exaggerate.</p> <p>Present yourself and your purpose. Obtain permission and agreement to work with the local person.</p> <p>Adapt to the time schedule of your hosts. If they agree with your purpose, then they will help to arrange adequate time for it. They have many responsibilities with their family, village, the fields and their animals. Show your motivation to help them in their daily work and contribute to alleviate the daily tasks a bit.</p> <p>Ask for permission, also, if you want to take photos. Explain why you are taking pictures and send pictures to the local people once back in town.</p> <p>If you go to stay in a village or with a family, take some gifts with you, such as fruits or products, which are appreciated by the local people.</p> <p>Treat local people as equal partners.</p>	<p>Do not manage the people and their time according to your own interest and benefit.</p> <p>Do not judge the local customs as bad, strange or negative.</p> <p>Do not rush through the village due to an outside time schedule (lunch or dinner with officials).</p> <p>Do not push people to finish as many tools as possible. The learning and dialogue process is more important than many quick results and tools.</p> <p>Do not damage the local environment.</p> <p>Do not get drunk in the community.</p>

FURTHER READINGS

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Chapter 4: Process and Sequence of PTD

- 1. The Dynamics of PTD**
- 2. Protecting Intellectual Property Rights of Indigenous Knowledge**
- 3. Six Processes of PTD**
- 4. Teamwork**
- 5. Field Plan for Each Team**

1. THE DYNAMICS OF PTD

PTD is a dynamic process. Six activities or basic steps are seen as contributing to the development of this process. These are to be taken as guidelines, not blueprints, as interaction between the outsider and local villagers is unpredictable and follows no fixed schedule. Opportunities arise from the field, and a basic principle is to trust the capacity of the local people.

Once, when our IK-research team had arrived amidst heavy rain in a new, unfamiliar village in Columbia, we were at a loss where to go. A lady called to us from her veranda: “Please come in, it is too wet outside.” She asked right off why we had come to the village. When we explained that our purpose was to identify local experimenters, she revealed to us that she was cultivating some sixty different vegetables in her home garden and showed us baskets full of seeds under her roof. By coincidence, we had found the most eager experimenter in the village.

TIME

PTD is a long-term task, requiring time and patience. Generation of technologies can take one or several seasons or even years. The development of the activities requires several visits over an extended period of time. The generation of technologies is in the hands of the local experimenter, who can follow up on his or her own experiments over months and years. Nevertheless, it is insufficient for us to start off a process and abandon it. It requires patient, persistent involvement over a long period of time with the experimenter. She or he requires sustained dialogue and advice, feedback, and sometimes just interest in his or her experiment.

Considering the different tools used during the process, each one requires time. Do not rush through the tools simply to fulfil them. The tools are merely a means for dialogue and finding ideas and therefore require conditions of creativity. The first condition for creativity is giving time (or mental space and quietude) to reflect, discuss issues, and develop new ideas by looking at old practices with new eyes. Old customs may be future treasures.

If you want immediate answers or need to spend funds quickly, then do not get involved in PTD. PTD is a joint learning process, which requires time, patience, flexibility and determination. PTD is not a project (goals, methods, budget, etc.) but a joint way of learning and advancing with unpredictable solutions and outcomes. It is an open-ended process.

2. PROTECTING INTELLECTUAL PROPERTY RIGHTS OF INDIGENOUS KNOWLEDGE

CHECKLIST FOR INDIGENOUS KNOWLEDGE RESEARCHERS AND FACILITATORS

- Preliminary preparations
- The funding application is prepared in collaboration with the local people living in the area
- Outsiders agree in writing to respect the indigenous property rights of local people
- The community management structures are fully involved in developing the program
- Community representatives help establish guidelines and policies for the program
- The researchers, the community and each informant sign an agreement before the start of any field activity

THE AGREEMENT

The agreement between the community and the outsiders (researchers, facilitators) outlines the following:

- Who “owns” the indigenous knowledge and who can use it
- Restrictions on the publication (dissemination) of certain types of information, which belong to intimate or secret aspects of cultural life
- How and by whom the information will be collected and used
- The location of the program activity, including a list of sacred sites and taboos
- Responsibilities of each party
- Adequate compensation for local experts who provide information
- Expected benefits for and impacts on the community and the researchers
- Reporting and monitoring requirements during the program implementation
- The community’s role in the review of the all final reports of the research
- How the information will be made available to the community, how it will be released to others, the number of research copies, including photographs and other research products (for example, plant collections), that the community

will receive at the conclusion of the activity

- The sponsor's rights over the final report
- Copyright arrangements, including any arrangements for co-authorship of publications

If any information (for example, plant variety or local technology) is commercialised, the agreement indicates:

- A requirement to negotiate with the original holders of the knowledge any arrangement for how to proceed

POLICIES

If the field activity involves the use of cultural artifacts or the removal of biological samples, policies should be developed to regulate the following:

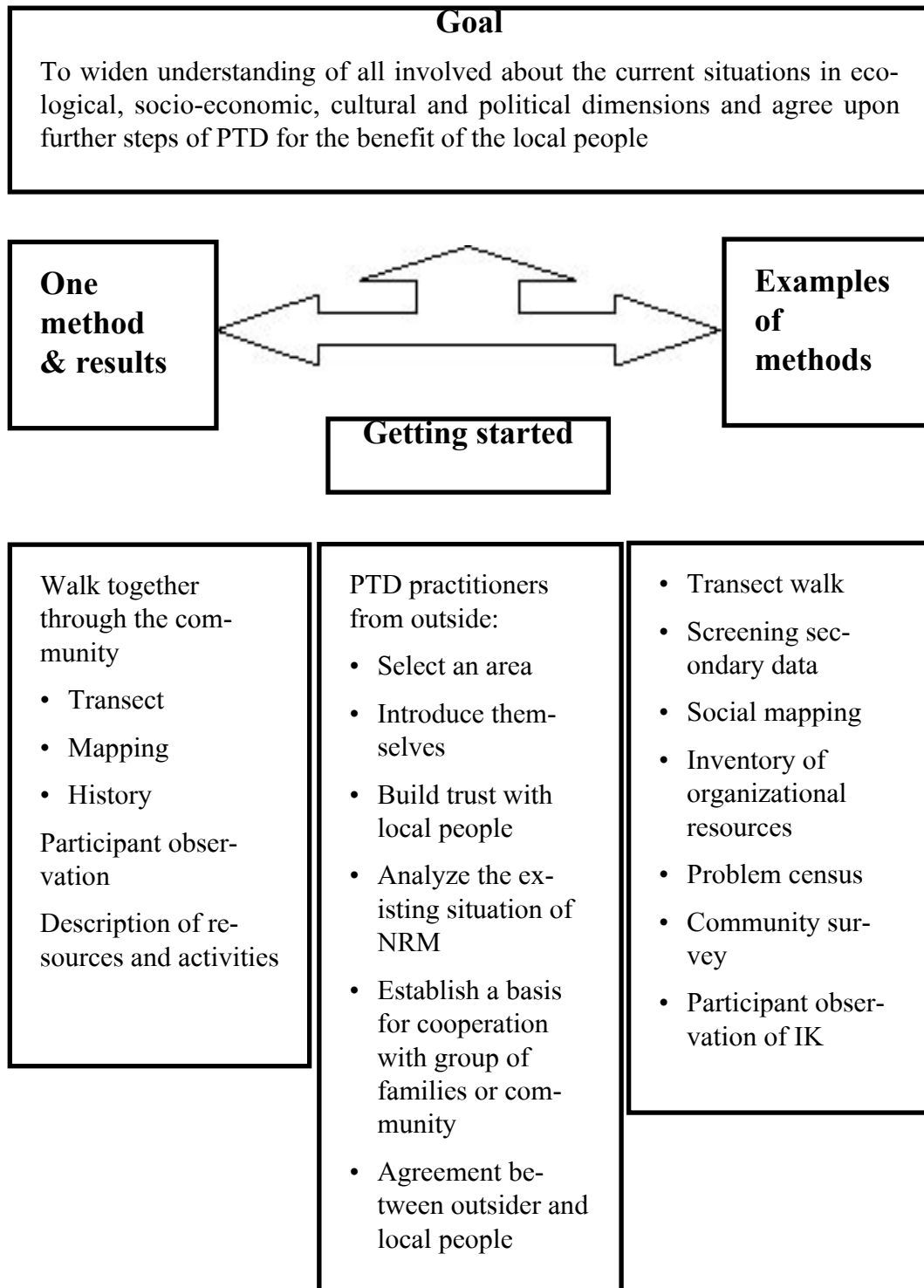
- The use of folk variety names and other cultural symbols in connection with the marketing of seeds or food products
- The collection, use, and distribution of biological materials by outsiders
- Restrictions on any commercialisation of the collected species

3. SIX PROCESSES OF PTD

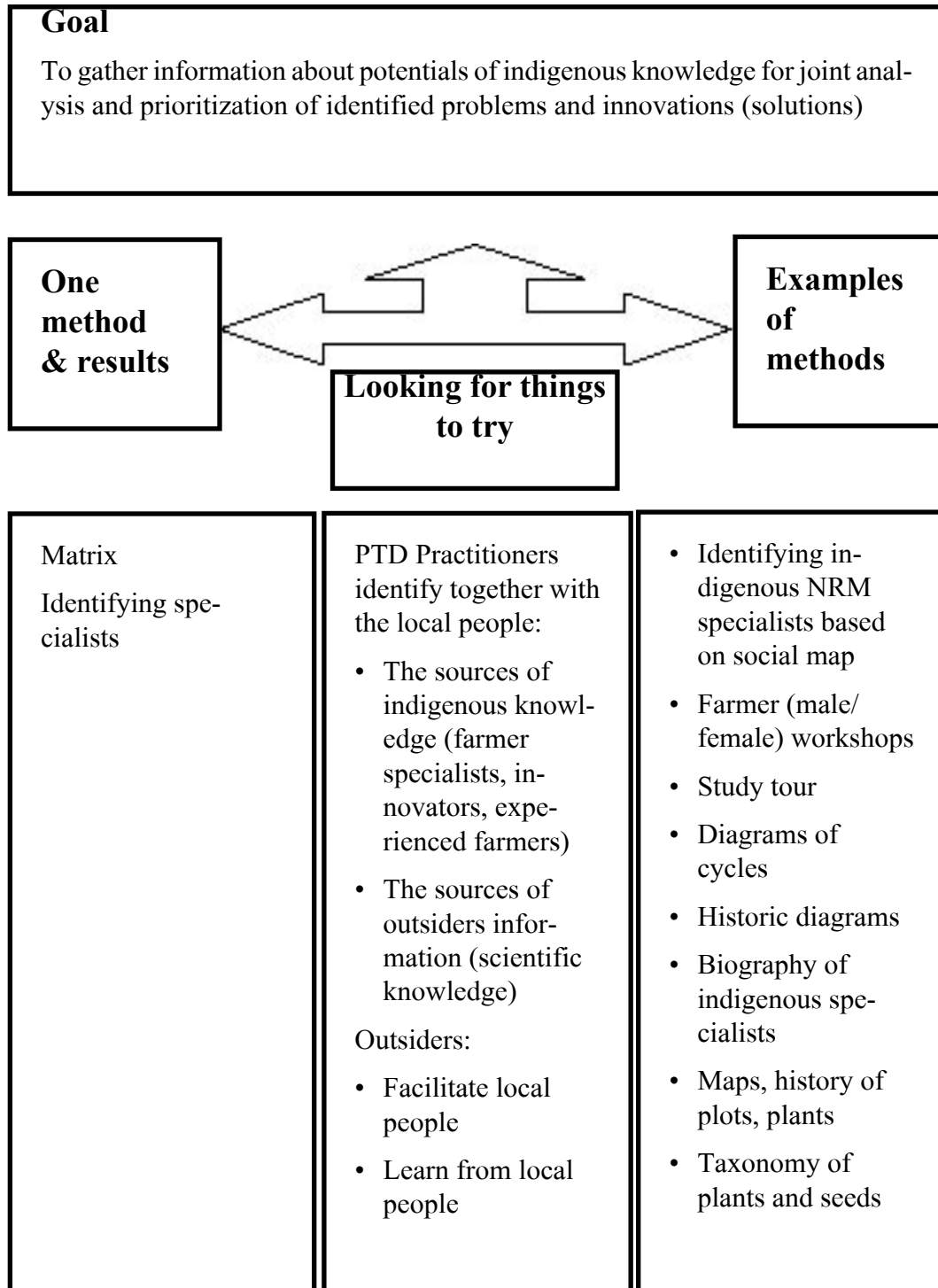
SIX ACTIVITIES:

1. Getting started
2. Looking for things to try
3. Designing experiments
4. Trying things out
5. Sharing results
6. Keeping up the process

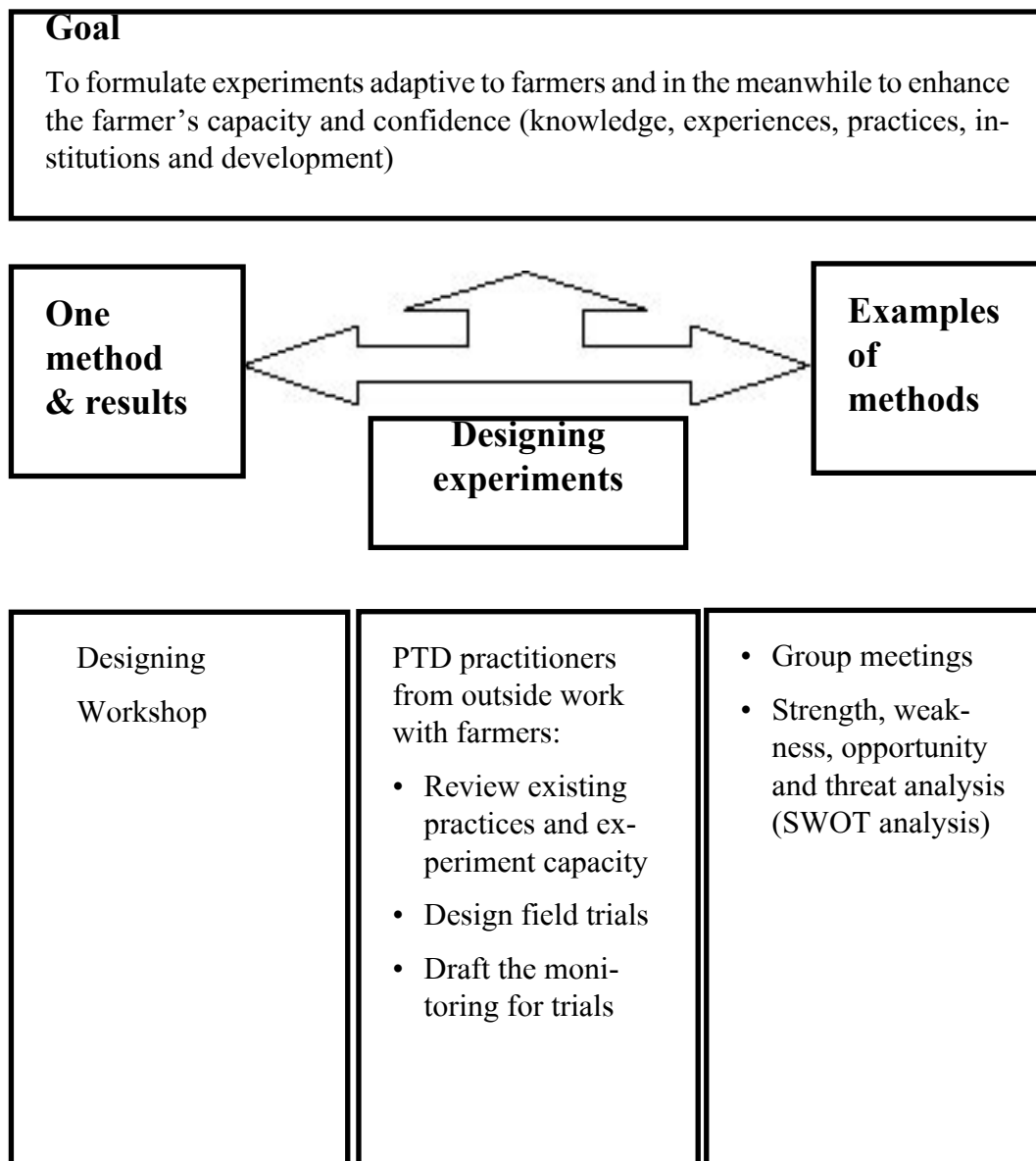


1. Getting Started

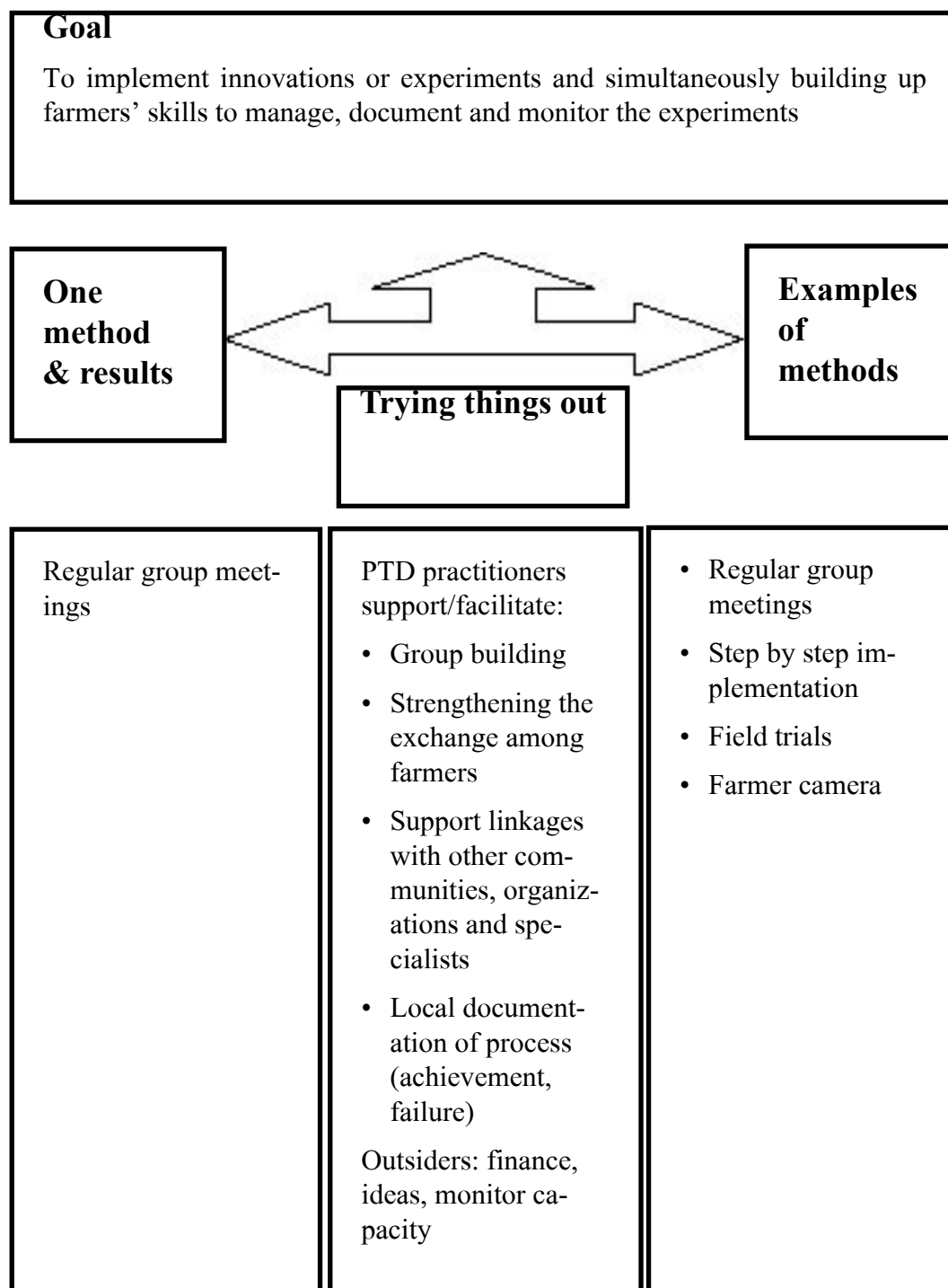
2. Looking for things to try



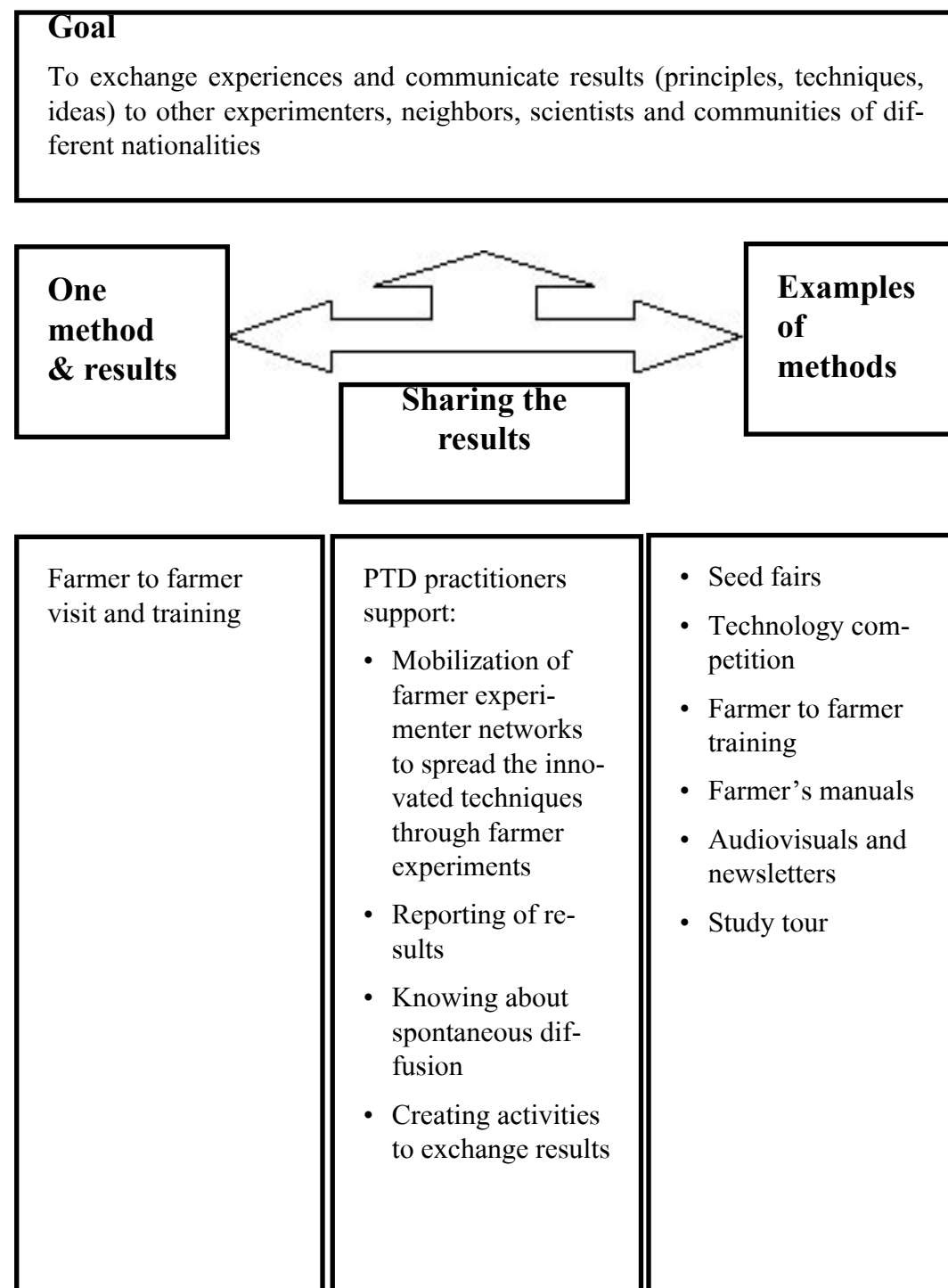
3. Designing experiments



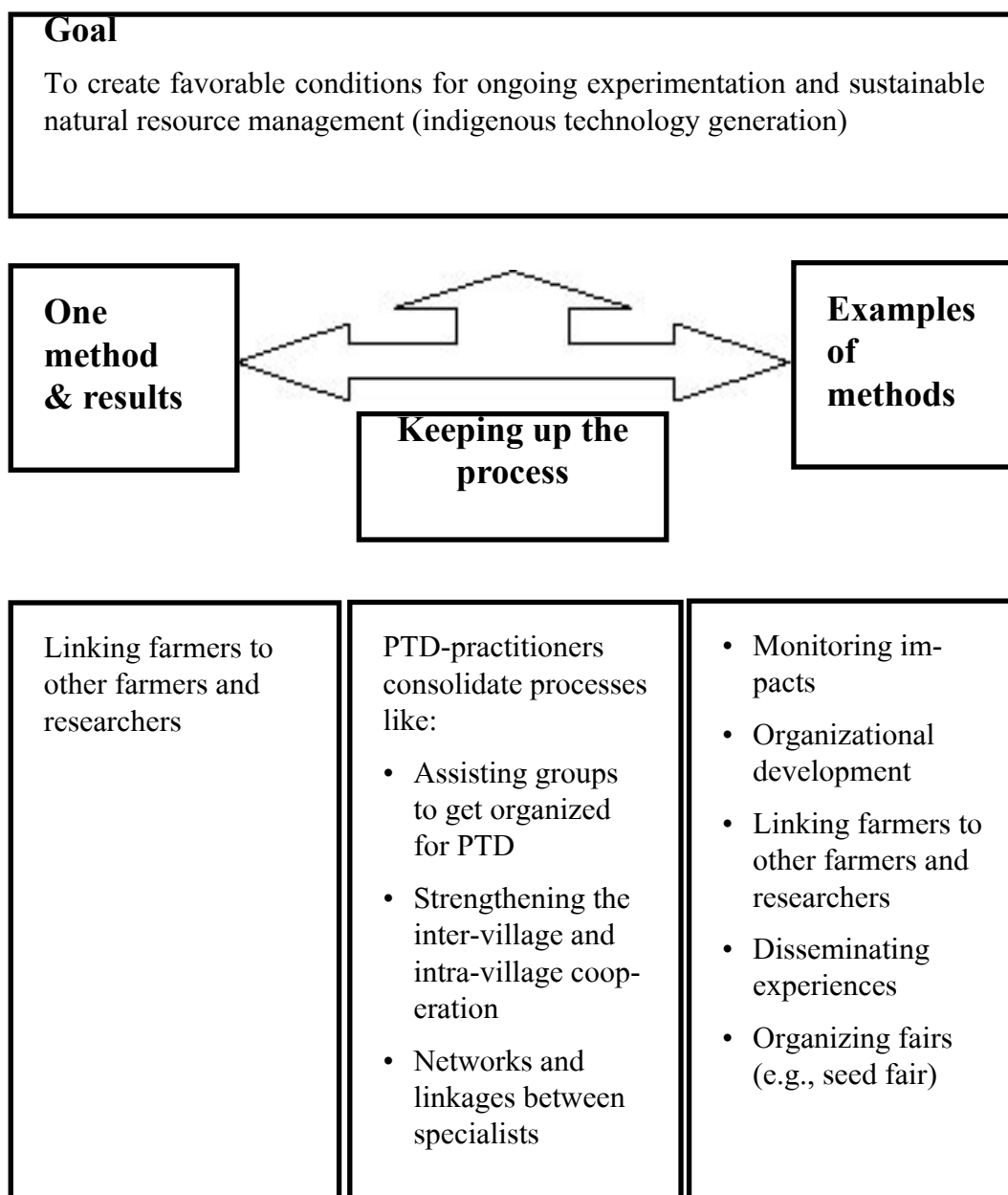
4. *Trying Things Out*



5. *Sharing the results*



6. Keeping up the process



4. TEAMWORK

Teamwork is a learning opportunity which aims to:

- Establish dialogue and transparency with all members of the team
- Cooperate within the team
- Achieve a common goal and understanding for the field work
- Have a clear work plan for the field task
- Know each person's abilities and value, acknowledge and enhance them for their contributions to the team work
- Adopt a learning attitude by practicing open questions
- Develop an identity as a team, strengthening group dynamics during preparations and development of the field work
- Share experiences and ideas

FACILITATION OF TEAMS

Facilitation of teams is undertaken by one or two people. Decide on a work plan and division of tasks based on the individual capacities, and learning it aims to improve skills. One or two facilitators apply each tool. One person accompanies the resource persons and facilitates the process of developing ideas and visualizing the results. If you work as a pair, one person facilitates and concentrates on the interaction while the other observes, assists and documents the process (providing materials, taking pictures and notes). Never work with a larger group of facilitators when using a tool, as you will overwhelm the resource person and intimidate the flow of ideas.

In the village the whole team should divide into sub-groups, to go to the houses of specialists, or to walk with them in the forests or fields. Avoid working together in one place even if applying the tools in parallel.

PREPARATION OF THE TEAM

The team prepares a work plan for the field. In this work plan each person assumes responsibility for the application of specific tools. Practice the tool beforehand, so that you know the different steps of each tool and can prepare the right materials, have the necessary questions at hand to stimulate the ideas of the resource person, and get an

idea about the intended result. In the team the members may take responsibility for the tool they are most familiar with or which they wish to learn about. Sometimes it is useful to combine in a pair of facilitators, one with knowledge of application of a tool and the other learning to apply it. Afterwards the other facilitator can apply the tool with another resource person.

TEAM MEETINGS IN THE FIELD

Determine at what time you will gather as a team again. This may be meal times or in the evening before going to sleep. The aim of this gathering is to exchange the experiences, show the resulting diagrams, ask questions about shortcomings, and plan for the next day's work, or reflect on how you can improve your own skills and attitude the next time you apply the tool.

FIELD NOTEBOOK

Each team member has his or her own field notebook. The notebook allows each member of the team to write down his or her observations each day. Field notes may include field observations, topics, the process utilised and individual learning processes. It should be a custom for each team member to write their own ideas and observations during quiet moments, either after meals or before sleeping. Revise the notebook regularly, as it is the basis of monitoring your own learning process and writing the field report combined with the tool results.

TEAM EVALUATION

Evaluate your own group process by drawing on a time line for the field work, with a curve of positives and negatives of the field work experience. Highlight the positives as moments of good teamwork, strong interaction with local villagers, achieving new ideas, and so forth. Highlight the negatives as moments when the involvement of villagers was reduced, the team did not function properly, and the overall spirit was lacking.

5. FIELD PLAN FOR EACH TEAM

OBJECTIVES OF FIELD WORK

1. Establish a trusting relationship with local communities and agree upon the purpose and procedure of field work and of farmer experiments
2. Identify indigenous specialists
3. Tap indigenous knowledge of different agroecosystems (visualisation)
4. Farmers document the process and indigenous knowledge

5. Design farmer experiments together based on the following criteria:

- Managed by specialist (household)
- Use of local resources (low external input)
- Based on indigenous knowledge
- Organic production
- Strengthen self esteem and cultural identity
- Improving diversity of plants/animals
- Enhancing the local capacity of technology generation

6. Agree with community and specialists on follow up

STEPS FOR FIELD WORK

Getting started

- Present the group
- Agree on tasks with villagers
- Study secondary data
- Transect walk and transect drawing
- Participatory observation
- Agro-ecosystem mapping
- Social mapping/identify specialists

Looking for things to try

- Indigenous knowledge for each agro-ecosystem
- Diagrams (Matrix, Social map, History, Seasonal calendar, Tree diagram for different plants and plots)
- Ethno-Taxonomy
- Biography of specialists
- Gender use of resources

Designing experiments

- Describe valuable indigenous knowledge
- Participatory Technology Analysis

- Farmer design workshop

Plan your time: when, what and who will do it

Chapter 5: Innovations and Experiments

- 1. Farmer Specialists**
- 2. Rights of Experimenters**
- 3. Action Plans for PTD**
- 4. Case Studies**

1. FARMER SPECIALISTS

Indigenous farmers are innovators and experimenters, otherwise their societies would not survive. They collect seeds and plants everywhere and include them like new children in their family of plants and seeds. They nurture the new plants and try to adapt them to the local conditions, giving them care and support, until they are sufficiently robust to become full members of the system. The farmers observe nature and the conditions it provides so they can offer the same conditions to their newly adopted plants and seeds. They will handle new seeds and plants like beloved children, trying to educate, domesticate and nurture them.

Experiments are done through intuition. Seeds are collected from other fields or from the forest and then brought back to their own spaces for experimentation. The farmers will observe how the plants develop, whether the seeds sprout, and try to provide the best conditions for them. Innovations occur through getting ideas from other farmers (even from other villages), by trying out new things carefully, creating new combinations of plants for intercropping, and applying all knowledge available. As knowledge and skills are culturally embedded, innovations also have a cultural logic—either by their meaning, by the social consequences, or by incorporating them into the local food customs.

Farmers engage continually in a selection process. They will observe the qualities of each plant, select special plants with their own criteria (of color, size, taste, cleanliness, resistance to weather and pests) and select the seeds afterwards according to their quality. Over time these will develop into new lines of plants (varieties), which will increase the agro-biodiversity in the area.

Farmers do not follow the scheme of a scientific experiment. They will not separate specific demonstration plots or experimental areas. Their experiments are incorporated in their actual fields in a search for the best conditions to nurture the new seed. Nurseries also are established in their local fields or home gardens using no specific areas and technologies. Thus outsiders find such experiments difficult to distinguish as their own experience leads them to expect the formal, segregated laboratory-type conditions of an experiment. The farmers experiments are intimately bound to their land and simultaneously deal with many variables, social as well as natural.

2. RIGHTS OF THE EXPERIMENTERS

Definition of a property right (according to Elinor Ostrom, from Indiana Univeristy USA)

“a property right is the authority to undertake particular actions related to a specific domain. For every right an individual holds, rules exist that authorize or require particular actions in exercising that property right”

Experimenters and local communities have clear rights for the management and use of natural resources. These orient the field process of PTD and can be understood in the following terms ([Menzies, 1995](#)).

A KEY CONCEPT: BUNDLE OF RIGHTS

A bundle of rights indicates that rights can be divided into a number of different, discrete rights or sets of rights held by the property-holder. These rights can be exchanged, bought, sold, restricted or withdrawn according to customs and laws.

A bundle of rights consists of detailed and elaborated codes drawn up regarding the utilization of natural resources, by individuals or communities.

For example, farmer’s rights to the trees they plant in their homegardens determines:

- what to plant
- how many of anything s/he wants to plant (within biophysical and spatial constraints)
- where to plant the trees
- how to manage the trees (pruning or not; fertilize them or not; use the leaves or fruit; keep chickens or pigs or rabbits underneath the trees)
- when to make use of the tree itself or its products
- when to cut down the tree (for timber or to clear the view or to plant another preferred species because the fruit or timber markets have changed)
- whether to use the product for home consumption, give it away, or sell it
- whether to sell the live tree to someone else (without cutting it)

There are more rights than these`

DIFFERENT CATEGORIES OF RIGHTS

- *Management*: concerns who has the power to make decisions to use the resources to meet the user's objectives.
Is it a government agency—near to or far away from the village?
Is it a nearby agency that is distinct from the community?
Is it a powerful individual residing locally or far away of the community?
- *Exclusion or Access*: refers to the imposition of controls over who will have access to the resource. Is the control in the hands of the state, the collective, or the users?
- *Alienation*: can refer to the extinction of a previously existing right, or it can also refer to the right to transfer a specific right or even the whole bundle of rights to others.

3. ACTION PLANS FOR PTD

Having clearly delineated the rights of the experimenters, we can proceed to develop the action plans for PTD.

With a group of specialists from the village, the resulting ideas are analyzed and prioritized. Action plans are designed which allow assessment of the feasibility of each idea. The whole group agrees on the new experiments, responsibilities are designated, and the farmer specialists prepare themselves for the implementation of the experiments. The group of experimenters constitutes a nucleus for the farmer network and helps to monitor the experiments. Within the group they can discuss their proposals, improve their technologies, and exchange ideas.

Innovators are often criticized, because they are adopting new ways. A group of innovators can better defend itself from public criticism and reinforce the willingness to be creative and change the traditions. The action plan is the collective tool to guide and monitor the experiments.

DRAFT OF ACTION PLAN

Name of Village:		Name of Household:			
What?	Where?	Who?	When?	What is needed?	Who will monitor?
Type and name of experiment Idea and technology Link to indigenous knowledge Gender use of resources diagram	In which area? Agro-ecosystem Local name? Size of plot? Owner of land? History of plot?	Name of farmer Specialist knowledge of farmer (also family members) Role of man, role of woman Cooperation with other farmers?	Time-table of doing the experiment Time-table of monitoring visits Indication of farmer camera tasks	Seeds, plants or animals Tools Technical advice Costs (labor, inputs, advisor time)	Project office and line agency Responsible person What does monitoring mean?

CRITERIA FOR ACTION PLAN

1. Does it enhance biodiversity?

- Local species
- Wild species
- Multicropping (integrated systems and resource flows)

2. Is it based on indigenous knowledge?

- Idea from their own villages
- Techniques used in the past which are no longer practised

3. Is it sustainable?

- Low external input (little or no chemicals)
- Budget is between 100 and 5,000 RMB
- Labour intensive and technological skills involved
- Increases the innovations of farmers

4. Does it improve quality of life?

- Gender balance

- Healthy for animals, plants and human beings
- Supports indigenous livelihood (cultural expression)

Other criteria include: is it an individual enterprise? a family task? a group of farmers involved? can the whole community benefit from the experiment in the future? are they informed and do they support the work? As this is not an investment program, we exclude micro-credit and plantation schemes. Furthermore, we have to be sure to avoid the big risks involved in going for large scale experiments. This is to say that experiments should be small in scale but have the potential for scaling up—such as, supporting skills, nurseries, seed production and dissemination to other households and villages.



Fig. 5.1 In Nanping Village (Dai ethnic group) Ai Wu wants to engage in an experiment involving an integrated system encompassing a fish pond, vegetable garden, banana fields, pig raising and buffalos (for work and for manure). He wants to create an organic cycle of the ecosystem and use the land resources intensively but sustainably.

4. CASE STUDIES

LAHU

By Maruja Salas

Some remarks about and uses of some meaningful natural resources in Huilao Zhao are to be taken into account in PTD actions.

The Black Lahu have been recently settled in life conditions of a “village.” It is less than a generation since they have been “upgraded” to be farmers. Previously they lived in intimate relationship with the forest resources as hunters and collectors. As a consequence of the drastic change in their livelihood, the Lahu are undergoing a remarkable process of adaptation to the new environment under the most pathetic pressures. They have to inhibit most of their behaviour corresponding to the culture of hunter and gatherer due to the fear and shame of being considered backward or primitive. Unfortunately, the repression of their identity as intimate dwellers of the forest is pushing some of the elders to alcohol abuse, and some of the young man unable to transform themselves into successful farmers are behaving as if they are rootless in regard to their own origin.

In spite of these deplorable conditions, the Lahu people are making struggling very hard order to survive. Some examples worth mentioning include:

1. Lahu conceive water as it would be running from the river, or flowing from the fountain. That is why they never close the water tap.
2. Most faucets are located above the pig stall so that the excrements are washed away to fertilize the paddy fields. That increases the productivity of the fields and avoids the use of chemical fertilizers.
3. In order to open fields to cultivate maize, many trees were sacrificed. They had little enthusiasm for this enterprise, since they venerate and worship each tree. It was told to them that maize would increase their cash income. Neither the technical prescriptions nor the market conditions were advantageous for the Lahu. Since they have a close relationship to animals and maize is not yet fully accepted as significant part of their diet, they prefer to feed the maize to their pigs. This is a women’s task. Pork is a favourite meal eaten with vegetables and rice. Lacking cash income, it would be impossible to hire somebody for construction or agricultural labour. Having pigs well fed with maize, Lahu women can engage labour for “payments” in the form of dishes cooked with pork.
4. Bamboo fences around some growing plants like papaya and maize serve as a symbolic form demonstrating their domestication efforts while conveying a message of low-input agriculture. Lahu understand their new living conditions

as a process of getting use to a new environment together with water, plants and animals.

5. Water harvesting is also a form of domestication. Therefore the fences have been constructed around their water sources. Of course this is to keep the animals away, but that is obvious.
6. Even the water in a cement tank is being domesticated.
7. Drawing on their collector traditions and knowledge, Lahu men and women bring plants they know and like into their home gardens. These are located with special care under conditions similar to those of the forest. Then, with limited manipulation, they wait for the plants to accustom themselves to the new environment. Sooner or later these generous plants are ready to be harvested, almost without labour or external material input. That means that the Lahu are co-creators of the currently most advanced agricultural technology called, in scientific terms, “low input agriculture.”

YAO WOMEN IN MENG LA

By Timmi Tillmann

At the end of the affirmed road we arrive in the Yao village, an assemblage of twenty houses along the central road or place, surrounded by forested mountain ranges. The cane sugar and paddy fields are further ahead along the small river, which passes south of the village. The central place is a plain area, and all the houses have been constructed to face this place. Behind the houses are areas for pig feeding and chickens, and below these are the households' home gardens.

The home gardens are managed by the women, who prepare the soil, select and sow the seeds, cultivate the plants, and harvest the crops. Only small parts of the production are taken as surplus to the market. Most remains for home consumption, providing a multifold basket of fresh vegetables to the family's diet. No chemicals enter into the production process. Rather, women gather the manure and guano of their animals to fertilize the soil. Production occurs throughout the year. Though production decreases during the dry season, women carry water from the river to water the plants. Men are asked regularly (every two or three years according to need) to help to reinforce or rebuild the fences, which are made of bamboo and wooden posts, to hinder animals from devastating the plants.

The women have achieved a great diversity of plants. In 30 minutes they can collect more than 50 different species and varieties of plants. Most are vegetables, some are medicinal herbs or spices, a few are ornamental plants. All plants have a Yao name and most seeds come from their own collections, either from previous harvests or

from the wild. Some seeds are bought in the neighbouring Dai village on the market day, and they also exchange seeds with other women. But all the home gardens have their own characteristics according to their location and the particular preferences and skills of each women.

Most women prefer to sow their vegetable plants in rows without intercropping. Single plants, medicinal herbs or spices are placed only at the borders of the plots or seed beds. The plants are fertilized in the row, with each plant receiving a small amount of guano. But one Yao woman from another village, who had come to visit her relatives in the village and subsequently remained for several years, has introduced a different system. She prepares a seed bed and fertilizes the soil by mixing guano into it. Then she sows four or five different vegetable seeds in one bed so that a mix of vegetables grow all together leaving no space for walking. She then weeds and thins the plants, transplanting denser populations to empty spots. The other women consider that she uses too much fertilizer, and that it is difficult to walk inside and requires too much work to weed and cultivate the plants.

Innovations are constantly made through a process of trial and error. New seeds are brought into the home gardens and nurtured to adapt to the local conditions. Women do not want any financial support and do not require external support. They do not feel that there are any problems with their home gardens, and they see them as perfect for supplying food to their families. The women fear that if men get involved in their home garden management they will take over their initiatives, start to control outputs, and develop a cash crop scheme which will undermine their own system of exchange and their families' security and prosperity.

AKHA

By Wang Jianhua

The village of Xiao Xin Zhai has 50 households, 214 people, 130 mu of paddy fields, 390 mu of sugar cane fields, and some swidden cultivation for corn. It has both collective forest and family forest within an altitude range between approximately 1,200 and 1,800 masl approx. It consists of a mix of Lahu, Yi, and Han ethnic groups.

Historical Diagram

The historical diagram covers a period between 1967 and the late 1990s. It also includes a vision of the future.

Before the cultural revolution in 1967 most species of Yunnan native pine trees, *ma li shu*, could be found there. The number of people was low compared to the availability of the forest resources and the population of wild animals. The villagers practiced typical upland swidden agriculture in which they grew two varieties of

rice and three of corn. They used the animal manure as fertilizer and the yellow cow for animal traction.

In the 1970s, the forest cover and the wild animal population of deer, wild pigs, monkeys, wild chicken and flying squirrel decreases while the human population increases. Terrace technology is introduced together with nine varieties of rice, including land races and upland corn. Animal manure continues as means of fertilizer as does animal traction.

In the early 1980s, a nature reserve is established. Since then the forest species have been recuperating in number and diversity. The human population increases a little and wild animals decrease, with wild chicken and mice still available. Only six varieties of rice remain and old varieties are not mentioned. Corn remains the same. Chemical fertilizers and herbicides are introduced. The village gets electric power, allowing for the operation of rice mills.

In the late 1980s, the forest continues to improve with increasing wild life, especially birds. Sugar cane is introduced on the terraces, and only four varieties of rice remain. Corn varieties from the agricultural station are introduced, but the old ones remain. Chemical inputs increase. Tractors are introduced without replacing the yellow cow as animal traction.

In the 1990s, the forest improves and more animals are available. Sugar cane is increased for cash income. Three varieties of rice remain, four varieties of corn. Chemicals and animal manure continue to be used. Television and karaoke become common. Water supply and trucks come to the village

In the future, the forest should return to its initial stage, with wild animals and the human population stabilizing. In agriculture, villagers do not want sugar cane plantation because it degrades soil structure and fertility. They wish to continue to use the animal manure and control the use of chemicals. They want telephone.

The experiment undertaken by the family Li

1. Land resources: sugar cane terraces, four plots (5.5 mu), paddy fields of rice (1.2 mu) and corn (0.5 mu), forest (5 mu), and a small vegetable garden.
2. They want to experiment with orchids *huang cao* in the family forest containing the following big trees: *wan guo shu*, *maxi shang shu*, *bai ma li shu*, *da qiao shu*, *hong mao shu*, *mali shu*, and *pine Song shu*.

For cash income

Technology: they want to reproduce the images from the forest ecosystem in their own family forest. The orchids will grow on the big trees. They will place the orchids

on the joint between the trunk and the branches without cutting the tree. The idea is to use biological resources in a sustainable manner, damaging neither the trees nor the ecosystems.

They can rely on their own knowledge in collecting the orchids from the nature reserve and transport them to the trees of the family forest. The father will monitor the experiment and share the experience with the villagers. If it is successful, he will scale up the experiment with other villagers.

JINUO

By Xu Jianchu

The Jinuo are an ethnic minority who traditionally lived only in the Jinuo mountains of Xishuangbanna, with a population of 17,843 in 1990. The Jinuo practice a combined shifting cultivation system, which includes shifting cultivation fields, jungle tea gardens (historically one of six major tea producing regions in Xishuangbanna), homegardens, and hunting and gathering. The Jinuo as one of the smallest and the poorest nationalities have received much attention from the government for development intervention. Yanuo is one of the Jinuo ethnic villages, and it is located on a main road on the northern side of the nature reserve. Shifting cultivation and limited paddy fields provide their most importance subsistence needs. Jungle tea and non-timber forest products collection are main cash income sources for local community.

The team arrived in Yanuo and called a village meeting. A group of young and elder farmers actively took part in the participatory mapping (land use, transect and social map), historical diagram drawing (seeds and crops, technology, environment), and time management (agricultural calendar and daily activities, and seasonal collecting of non-timber forest products). The results of these exercises clearly disclosed a rapid disappearance of agrobiodiversity in swidden agroecosystems and indigenous technology for their livelihood due to state intervention for upland development and market-driven cash crop plantation. A marketing failure in the form of a passion fruit plantation has resulted in dramatic decrease in the cash income of local farmers. Consequently the farmers are looking for an alternative in the form of diversification of species and technology for improving productivity in their swidden fields and augmenting their livelihood.

The different households have formulated their own experiment or action plan for participatory technology development as follows:

Propagation of wild vegetables in the homegarden

Due to easy access to transportation and increasing marketing values for wild vegetables, farmers are interested in trials or domestication of wild vegetables in their homegardens since the wild resources have decreased. One family has already experiment successfully in the propagation of sweet vegetable (*Sauropus androgynus*) and snake acasia (*Acacia pennata*) through cultivation of cuttings and seeds in a small plot. The other four households decided to join the experiments and exchange materials such as seeds and seedlings.



Fig. 5.2 The farmer innovator has drawn his homegarden to show its location and spatial arrangement. Based on his map, he prepared the detailed action plan, designed his field experiments and activities, located his nursery, and decided with whom and when to do those activities. The sketch map and detailed action plan serve as baseline information for later monitoring and evaluation.

Multi-purpose species for bio-hedgerow in the swidden fields

Based on an exercise in cultivation of multi-functional trees, farmers have selected two species, common paper mulberry (*Broussonetia papyrifera*), an indigenous spe-

cies for fodder and traditional paper-making, and the orchid tree (*Bauhinia variegata* var. *candida*), a multi-purpose species for vegetable, fodder, timber and medicine. Those two species are recommended by farmers for planting as bio-hedgerows in the swidden fields. Farmers anticipate that these species will enhance soil fertility and provide fodder for livestock. Women are more active than men in planting the multi-purpose hedgerow since collecting fodder is often women's task.

Training for grafting

There is a lot of potential for cash income from diversity of fruit trees, citrus, lemon, pomelo, and litchi. Farmers want to experiment with different varieties from neighboring communities and the lowlands. Training for grafting is essential for farmers. The six farmers have been selected by the villagers for joint grafting training.

Bamboo nursery

Sweet bamboo has been selected by all farmers for experiment. One farmer, who has a fishpond in his homegarden, is willing to establish the nursery before December for innovative propagation practice.

Improving jungle tea garden

Two farmers are volunteering to engage in different pruning trials in the jungle tea garden for improving tea production and to undertake intercrop with rattan along with big shading trees in the tea garden.

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Chapter 6: Farmer Specialists (Local Innovators) and Networks

- 1. Farmer Networks**
- 2. Seed Fairs**
- 3. Organizational Support of the PTD Process**

1. FARMER NETWORKS

Through PTD we try to establish and stimulate farmer networks. These networks are intended to socialize the experiences, experiments and seeds between different specialists. Networks can be initiated at the village level or within a community involving several villages. Once functioning, networks can be amplified into a local network of PTD-experimenters within a watershed or township, who meet regularly and organize local events such as seed fairs. It is useful to organize farmer-to-farmer visits in a region or province which can form the basis for a regional network of experimenters.

Farmer networks could be formed by members of ethnic villages from the same minority group, as their crops and customs may be similar, or they could be formed by members of different ethnic minorities to promote intercultural dialogue and exchange.

2. SEED FAIRS

Farmer networks can organize annual seed fairs after harvesting and before sowing for the new season, where farmers exhibit the best seeds of their plants as well as a show of recipes utilising the diversity of products achieved. The intention of seed fairs is to recover old seed varieties, promote an exchange of seeds, increase the diversity of crops and varieties, communicate new practices between farmers and highlight the diversity of crops and seeds. The annual seed fairs can be held during traditional festivals.

DEFINITION

Seed fairs are forms of *in situ* conservation by which genetic resources are maintained in their own natural environment. Per definition this is a sustainable way of promoting biodiversity because it relies on a continuous flow and selection of seeds by the local farmers themselves based on indigenous knowledge and the experience of reducing environmental and agricultural risks.

A seed fair is an organized one-day event. The farmers exhibit their seeds (especially the diversity of landraces), exchange seeds and experiences, discuss with the technicians about the characteristics, potentials and dangers of their genetic seeds pool. The outsiders apply the methods mentioned below, and together with the farmer network members organize the detailed program of the seed fair.

Seed fairs can involve several natural villages, one administrative village, or even a small watershed or valley or township. Normally during a seed fair 20 to 100 farmers can attend exhibiting between 15 and 100 different seeds of local varieties of crops.

Seed fairs should not be confused with weekly markets or common marketing strategies.

Seed fairs can be part of yearly markets that take place during religious festivals, after the harvest when farmers from different ecological zones get together. Very often these religious festivals are an opportunity to exchange seeds and agricultural knowledge.

OBJECTIVE

As a form of *in situ* conservation, seed fairs should encourage farmers to maintain their seed diversity. The PTD-facilitators should provide information about the existing mechanisms that protect the rights concerning the use of the landraces. The dangers presented by biopiracy and genetic erosion should be part of the exchange of knowledge between outsiders and insiders.

METHODS

1. *Preparation of the seed fair*: Using agro-ecological mapping, the facilitators contact the farmers (often women) who will attend the fair. It is important that the elicitation of the farmers' participation in the seed fair comes with full disclosure and consent.
2. *Agro-ecological mapping*: The facilitators should have a very clear picture of the ecological zones from which the seed come, the extension of the area, the distances, type of transportation, climatic conditions and other conditions affecting the seed flow.
3. *Location of the seed centers*: This consists of the establishment of an ongoing information system about the diversity of crops and where the seeds come from. Factors that affect the gene centers should be taken into consideration, for example, the distribution of High Yielding Varieties (HYV) of seed by the extension service or other projects.
4. *Triads*: These serve to register in a comparative and visual way, from the farmers' perspective, the characteristics of the seed, the different local names, the qualities of the seed, agronomic information, and so on.
5. *Competitions*: A contest can be organized within the seed fair to acknowledge the persons having the best *in situ* conservation practice. For that purpose, technicians with professional experience in the genetics of local races should be engaged as juries. Experienced farmers (usually women) can also be designated as jurors. It is important to establish a creative system of awards and not only money. For example, agricultural tools, certificates using hand-made paper and

similar relevant sorts of things can be used that exemplify and promote the spirit and philosophy of the occasion.

6. *Video documentation*: This is a possibility for registering the process of agro-biodiversity development in an area within an established time frame. It is necessary to maintain clarity around the following aspects:
 - a concept of what the film will be about (pre-production plan)
 - an explicit agreement with the farmers about the contents of the documentations (production plan)
 - a final, high quality film product, including the screening (post production plan)

If these steps are not previously and explicitly clarified, it is better to refrain from using video documentation. Otherwise you will end up with a useless accumulation of footage.

ADVANTAGES OF THE SEED FAIRS

Seeds are life forms that belong to the local people. Therefore the in situ conservation is a powerful way to enhance indigenous knowledge and biodiversity with an ethical basis. It recognizes and reinforces the intrinsic value of the plant species with a sense of responsibility towards life.

Seed fairs facilitate local communities to enjoy the fruits of their agricultural efforts as a collective right. They also might enable the local communities to recover their rights according to the customary law.

It is an opportunity of mutual learning, because the members of the NGO will learn about the legal protection mechanisms for biodiversity and the global issues related to the use and conservation of this important resource.

3. ORGANIZATIONAL SUPPORT OF THE PTD PROCESS

Many development practitioners and government officials thought that the major problem in rural development in China was lack of organization among farmers. A goal of development work in rural areas were to organize the farmers. The Chinese Communist Party had implemented socialist reform and created People's Communes throughout rural China in late 1950s, and the farmers had become fully organized. In Yunnan, similar institutional policies were implemented in a manner similar to elsewhere in the country. However, they did not work in Yunnan. In ethnic minority areas of Yunnan the reforms and attempts to organize farmers often undermined traditional institutions that had previously been developed over long periods of time for managing natural resources on which the livelihoods of most communities depended.

In the late 1970s reforms began to address the failures of the commune system. In the early 1980s the household production contract responsibility system replaced the communes in an effort to separate state administration from agricultural production. This retreat of the state signaled a return to pre-Communist rural social organization. But despite some reforms of rural administrative structure in the early 1990s in Yunnan, the institutions which governed rural society—township governments and village offices—and the way in which village representatives and grassroots government officials interacted remained largely unchanged. The state realized in the 1980s that it was necessary to re-strengthen the community or village organizations for participatory decision-making and collective action on natural resource management and deeper rural reform as a means of initiating political reform. The “Village Organic Law” was passed in 1998 to support the reform in natural resource management. However, the decentralization process started at top and the democratic construction at the grassroots community level has still far to go in addressing the diversity and complexity of natural resource management in the mountain regions. These changes imply the need for changes in the behavior of both village representatives and township governments. The new system requires the township governments to respect and protect the villagers’ rights to manage their own affairs, as well as recognize the role the indigenous knowledge system can play in managing local natural resources including land, forest, water and other public infrastructure within the village.

The organizations able to support the PTD process can include the following:

1. *Elected village committee*: the village committees are defined as a form of villager self-management organization and are entitled to self-government based on the “Village Organic Law.” Village representatives are directly elected by villagers and are theoretically accountable to the Village Congress, rather than to upper levels of government.
2. *Customary institutions*: There is a diversity of social institutions in the ethnic minority areas of Yunnan. The customary institutions often consist of some customary authority (such as religious leaders and traditional chiefs) and indigenous regulations, such as the norms and rules, social relationships inter-linked with technical knowledge and power for decision-making and social interaction.
3. *Government technical organizations*: There are many government technical agencies that extend to the township level, such as forestry, agricultural extension, animal husbandry, water and irrigation. However these often lack either the capacity or incentives to provide good technical services for mountain farmers.
4. *Outside facilitation organizations*: The outside NGOs often play crucial role to facilitate the local conservation and development process. The NGOs can mobilize both financial and technical resources to support the PTD process.

5. *Emerging farmers' associations and local NGOs*: Many mountain farmers have established their own associations and even registered them as local NGOs. The outsiders should provide support for capacity building, technical support and facilitation of communication for such emerging local institutions.

Customary Institutions in Hani Community

The Hani are a patrilineal clan. The village chief (zoema) is normally a hereditary position but he may be selected instead by a group of knowledgeable and well-to-do village men. The role of the village chief was traditionally imbued with legal authority and religious functions, but never with the authority of an absolute ruler or even of a bureaucratic official. The chief makes decisions through discussions among the male clan (*pamou*) members and household heads. A communal committee consisting of headmen (*palu*), village chief (*zoema*), and the heads of clans (*pamou*) deals with the daily affairs of the community including delineating forest reserve boundaries, and selecting sites for swidden cultivation within the forest (Xu et al, 1999).

REFERENCE

- Xu Jianchu, Jefferson Fox, Lu Xing, Nancy Podger, Stephen Leisz, and Ai Xihui. 1999. Effects of Swidden Cultivation, State Policies and Customary Institutions on Land Cover in a Hani Village, Yunnan, Mountain. *Research and Development* 19 (2) 123–132.

Chapter 7: Participatory Monitoring and Evaluation

- 1. Principles of Participatory Monitoring and
Evaluation**
- 2. Farmer Monitors**
- 3. The Farmer Camera**

1. PRINCIPLES OF PARTICIPATORY MONITORING AND EVALUATION

PTD requires monitoring as we are dealing with experimental processes done by local indigenous farmers on their own plots. The monitoring is done by the farmers and the farmer networks themselves, with the outsiders supporting and systematizing the experiences.

Monitoring is therefore a documentation and information system which allows the farmers and the outsiders to know and understand the progress being undertaken in the fields and to learn from it for further experimentation and future tasks. Participatory Monitoring and Evaluation is a tool for learning and planning.

The monitoring of PTD must be easy to handle (for example simple formats and farmer cameras to capture certain moments) and simple to do by using symbols and drawings, and it should take visual forms to be easily accessible to other farmers and outsiders alike.

It should also provide a documentation of the PTD process, not only allowing discussion on the particular experiment being monitored but also encouraging the sharing and promotion of the similar experiment in other contexts.

2. FARMER MONITORS

The initial members of the local network as well as the experimenters establish their own monitoring system, such as field books, formats to register any activity related to the experiment, and the farmer camera.

The monitoring is not a control instrument. Rather, it helps document and keep track of the experiment. It also motivates the farmer experimenter to improve his or her knowledge and skill, and it socializes the experience. The farmer monitor is at the same time also a promoter for further experiments and the inclusion of new members in the PTD network.

3. THE FARMER CAMERA

The farmer camera is a tool to capture the progress of the farmer experimentation and to document indigenous knowledge out of the view of the villagers. By taking pictures, the local people emphasize their priorities and interests. Through use of this approach, we gain the local understanding of nature and agriculture.

Farmer monitors should be responsible for maintaining the good condition of the camera. They can take photos of PTD related activities, local indigenous knowledge and practices, cultural festivals and other social events in the local community.



Chapter 8: Training of PTD

1. Training of PTD

2. PTD Learning Process in a Workshop

1. TRAINING OF PTD

The following pages deal with the methodological support that facilitators provided to structure the learning processes of the participants in Participatory Technology Development (PTD). The workshop dedicated special attention to a sequence of “participant centered” activities to familiarize participants with the basic concepts, methods, skills and attitudes that are necessary for interacting and creating dialogue with farmers.

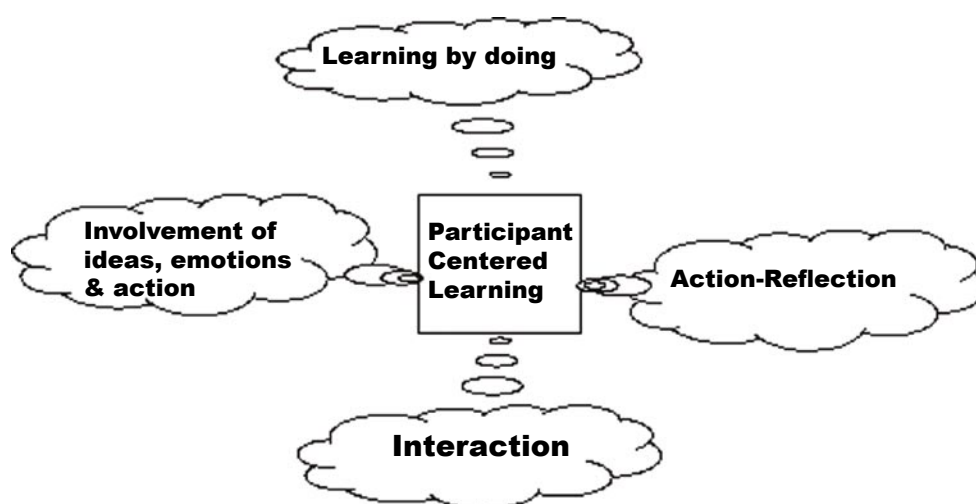


Fig. 8.1 The principles of the learning activities

Participants were given preparation to play a new kind of role with the farmers. Instead of being sent to the villages to give technical orders, they were learning how to facilitate local knowledge. This knowledge is fundamental for building up problem-solving processes based on the villagers’ capacities and for jointly planning PTD actions.

The initial workshop stage emphasized the role of facilitation by outsiders. For that purpose, the following sequence of learning activities was conducted:

1. *Familiarization and discussion* of basic concepts (1–2) to create a common understanding

2. *Practicing interviewing* so as to consciously exercise listening skills (3)
3. *Practicing teamwork* because the participatory process is not a one man or woman job (4)
4. *Exercising visualization skills* because the knowledge expressed in images creates awareness and helps to focus discussions on a topic (5)
5. *Presentation skills*: as a complement of visualization, presentation of the results allows for validation and feedback.

2. PTD LEARNING PROCESS IN A WORKSHOP

PARTICIPATION IS A SOCIOGRAM

Basic concepts such as participation, technology, indigenous or local knowledge, and development were presented briefly with visualized inputs. Immediately afterwards, an exercise was conducted on each topic. In figure 8.2 we see participants deciding at what level of participation they would involve the farmers they work with.

These concepts were written on cards and placed on the ground. The facilitator motivated the group members to place each of themselves on one of these categories by asking questions like: what kind of participation (farmers) is it when you as project staff provide 5 yuan per tree planted?



Fig. 8.2 Passive? Incentive? Consultative? Interactive? Autonomy?

As the picture (fig 8.2) shows shows, for two people on the left hand side it is active participation, for others it is interactive, and so on. Everyone can give reasons about why the action fits the category point of view they are standing on. This exercise helps to clarify the different understandings of participation in a group and reach some common ground for the PTD approach.

INDIGENOUS KNOWLEDGE

This very abstract concept was approached through a participant observation task in the local market.

Early in the morning participants went to the market and collected five products. They asked about the names in local languages, the farming system in which it is produced, how many generations it has been known, the uses of the products, other varieties, and who consumes it.

After the collection, they prepared a visualized presentation of local products for the plenary (fig. 8.3). This activity reinforced the idea of a common, shared and specialized knowledge that rural people have—that it is accessible but not in a spectacular way. It requires that the outsiders develop observation, inquiring and recording skills, otherwise indigenous knowledge can easily be overlooked.



Fig. 8.3 Indigenous knowledge from the market

INTERVIEWING SKILLS

Interviewing is the basic form of interaction when working with the PTD approach. The conditions for a successful interview are:

- An equal-to-equal relationship
- An atmosphere of confidence, trust and enjoyment
- Time and patience
- Interest in the topic

The results of an interview depend upon the above-mentioned conditions. A good tip for obtaining in-depth information is to divide roles and responsibilities:

A = a person who asks questions like *Who? Where? What? When? How? Why?*

B = a person who answers the questions

C = a person who visualizes on a big piece of paper, the key words of person B.

Another good tip is to have a face-to-face sitting arrangement, like in figure 8.4.



Fig. 8.4 The ABC of an interview

TEAMWORK STYLES

Equal-to-equal cooperation

Figure 8.5 portrays a very equal to equal interaction. No difference of status can be seen, and there is no dominance of one person over the other.



Fig. 8.5 Equal-to-equal co-operation

All three have the fulfillment of the task in front of them. They are clarifying the details of how are they going to approach the task. This form of work is convenient during fieldwork, especially with farmers.

One takes the initiative ... and excludes the others

Another style of teamwork, as pictured in figure 8.6, is when one person takes over the initiative, giving his or her back to another person, thereby reducing the possibility of contribution from the person behind them. He cannot see what the task is or how it is being solved.



Fig. 8.6 One takes the initiative and excludes others

The information should be equally accessible to all the members of a team for the successful fulfillment of a task.

Avoid being dominant and taking too much initiative, and thereby excluding the farmers, when doing fieldwork.

The crowd

If there are too many people around and working too closely, the chances of getting lost as a team are very high. As figure 8.7 portrays, one cannot tell who is working together, some are completely out of the process, others are far ahead in completing the task, while the three in the front and in the back have not yet started.



Fig. 8.7 The crowd

It is convenient to create a separate space to fulfill a task in an intensive way when doing teamwork. In the villages, farmers feel at ease in their homes and near their home gardens, so when you work as a team with them, let them choose the place for an interview or for the application of the methods.



Fig. 8.8 Supportive team

The supportive team

The members of this team in figure 8.8 are all focused on the task, without excluding anybody from the information. Although the sitting arrangement could show a difference in status, in this case it fulfills a supportive function.

Teamwork requires one delegated person to take responsibility as shown in the picture, the rest encourage her to finish her task.

Sometimes it is helpful to withdraw and delegate the farmers to take responsibility for completing a task. But don't go away, be near in case the farmers needs some feedback from you.



Fig. 8.9 One team member is left out

One team member is left out

Comparing the team interaction in figure 8.9, left, with the former photo, three persons are involved with great intensity whereas the fourth person is not engaged.

Some reasons for this pattern of teamwork are:

- The fourth person is uninterested in the task
- A team of four is

too large

- The fourth person does not have an assigned task or responsibility

When you do field work, try to involve everyone. If someone has been pushed to the background, ask that person a question and invite him or her to contribute with his or her knowledge.

VISUALIZATION SKILLS

Everyone has ideas in their heads. Some people can express themselves well with words; others can better put their ideas in images (figs. 8.10 and 8.11). These are not necessarily perfect drawings, but they are sufficient to communicate what we have in mind.

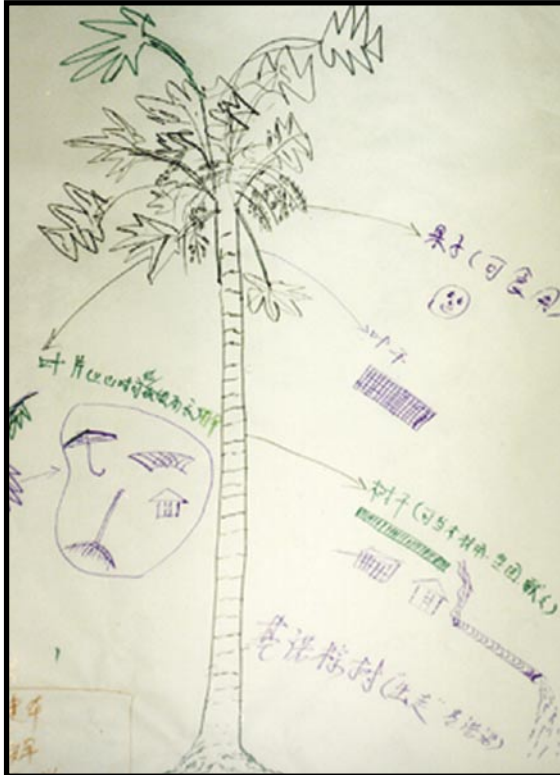


Fig. 8.11 The multifunctional tree

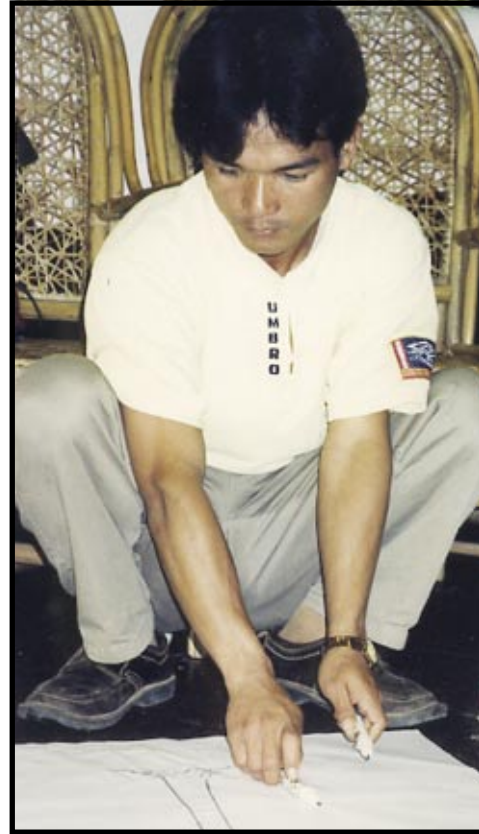


Fig. 8.10 Visualizing

The process of putting ideas into visual images is known as *visualization*. Its purpose is to share ideas in a focused manner and identify what is action oriented.

Rules for visualization:

- Think first
- Use the thick part of the pen and write big
- Use big sheets of paper
- Write some key words
- Take your time
- Never take secret notes

Visualization creates a focus of atten-

tion for presentation of results of farmers ideas and for a structured discussion of several points depicted by them.

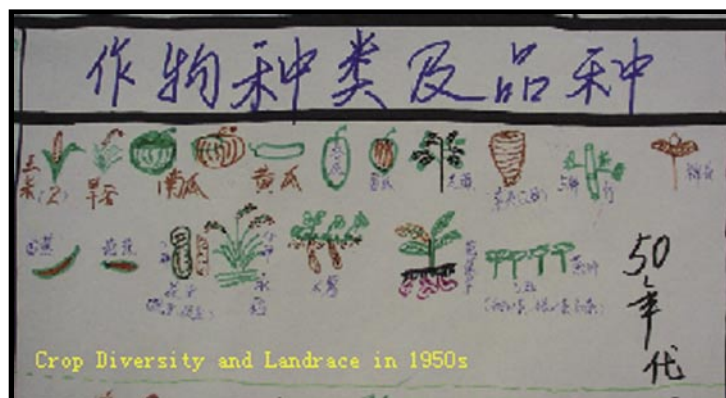


Fig. 8.12 Visualization of landraces

Through visualization we learn more about the ideas farmers have.

In the visualization portrayed in figure 8.12 we learned the crop diversity and richness of local landraces from different times.

PRESENTATION SKILLS

Presentation of visualized results is not the same as reading a scientific paper. Therefore some rules may be stated as follows:

- Before presenting visualized results, look at the diagram or chart for a few minutes to grasp its essential elements and construct mentally what you will say
- Locate the visualized results where everybody can see them, no farther than 8 meters from their eyes
- Stand to the side of the visualized results and keep eye contact with the rest of the group.



Fig. 8.13 How not to do presentation

Do not do as portrayed in figure 8.13:

- No eye contact with the group
- Reading instead of presenting
- No interaction with the “public”

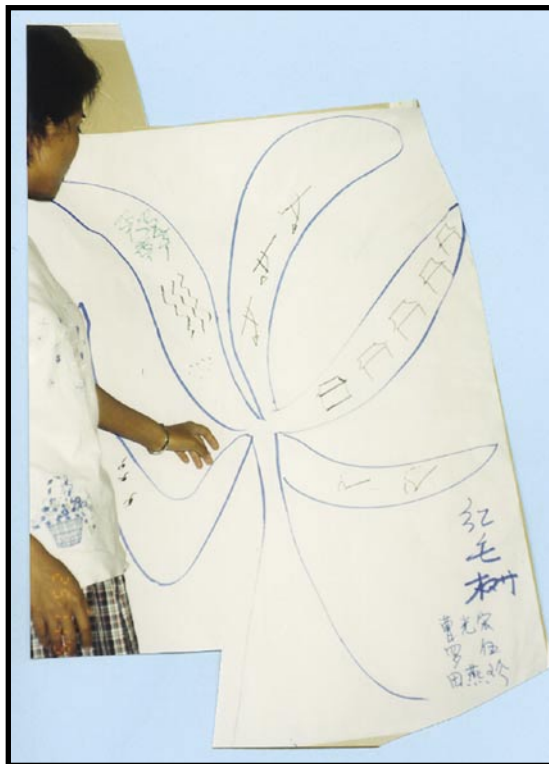


Fig. 8.14 Properly done presentation

Do it as demonstrated in figure 8.14:

- Use your hand to indicate the essential points in the visualized results
- Let everyone see the visualized results
- Speak slowly and only refer to the contents of the visualization, without adding too many comments
- Allow time for questions and feedback

FURTHER READING

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Chapter 9: Outlook

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We are involved in an innovative process of PTD with indigenous people in SW-China. This is a starting point, and we have edited this manual to provide guidance to the process. The processes, methods and tools described here are not final or definite, but food for thought, providing ideas for further experimentation. The field experiences therefore need to be further documented and evolved, until we can edit the next version of this manual with more examples and more diverse methods.

The conditions for PTD in Southwest China are promising. First, there is a public awareness about the values of ethnic minorities and the need for biodiversity conservation. Second, there are the hidden treasures of the heritage of dozens of indigenous peoples in one of the biodiversity hot spots of the Earth. And third, CBIK with its strategic partners is developing a creative and innovative approach to strengthening biodiversity and indigenous knowledge by implementing and applying PTD. Fourth, with a policy of decentralization of decision making, the Chinese government is opening space for local innovation and creativity.

There are still barriers to the success of the approach, however. Not all technicians can adapt to the new ideas of democratization and decentralization of the natural resource management approach. Bureaucratic attitudes and regulations hinder the free generation of technologies by farmers. Often the local technicians reproduce recipes which they have received from agricultural stations or foresters without trying to understand the local conditions of nature and culture. Many misunderstandings and frustrated attempts to introduce new crops have led farmers to distrust official agencies. Too often the technologies from outside had been designed according to external interests, needs and values without involving the local farmers in adapting them to their own conditions or, for that matter, deciding whether they want to pursue different alternatives or want anything at all. The technicians have neither clue of nor access to the local practices and indigenous knowledge. They do not value the cultural heritage, and they are uninterested in the local languages. By neglecting the languages, they contribute to the loss of knowledge and also to that of the the associated cultural form and biodiversity.

The main problem resides in missing ethics and respect of the rights of local people. This is not only the question of how to apply a specific tool, or how to communicate with local farmers, which can be learnt. It has more to do with the self-understanding of the outsider towards the local people, his or her role among them, and the ethical principle applied in the form of transparency of action, negotiation and signing of agreement with the local villagers, and the fulfillment of responsibilities and work plans. As the ethical attitude is uncommon in the official relations between institutions and villagers, the local people also do not expect the respect openly. A new culture and tradition of mutual respect needs to be nurtured and cultivated.

The main potentials lie in the capacity of local cultures to survive in their livelihoods, in the ability of indigenous specialists to experiment, and in our capacity to learn from indigenous people. Therefore we need to document the processes, the experiments, the innovations, so that other technicians and decision-makers can learn and improve their function as facilitators of indigenous processes.

Glossary

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GLOSSARY

Biopiracy: The theft and privatization of cultivars and genetic material historically developed and used by farmers and indigenous groups. It is seen as a larger process of enclosure of the commons, or shutting off people's access to human cultural heritage.

Corpus: The body of particular and complex ways of perceiving, conceptualising and symbolizing the direct utilization of resources is stored in a collective repertory of ideas. Guides conservation of resource practice. (21)

Cosmos: A people's vision of the entire universe encompassing natural resources, environment, land or nature that explains humans' expropriation of nature. Regulates relation with nature. (page 20)

Development: Presented as creating a more prosperous society by increasing human productivity. But on a more sinister level, it has been an ideology developed in universities, think tanks and governments which has framed the spread of the relations, culture and power of multinational corporations since the Second World War. It has generally be promulgated using top down technology, direct and indirect heavy petroleum energy inputs, destruction of local knowledge and culture, engagement of heavy national indebtedness, the depopulation and impoverishment of the countryside known as "draft urbanization," and the centralization of power in governments and productive organization. It has led to the expansion of corps of international experts and local professional and other elite classes leading to entrenched commitment to it.

Epistimic community: From the word epistimic, or knowledge, meaning a group of people sharing a body of knowledge and experience, but with individual members holding different "versions of particular topics, according to their own experience.

Ethnotaxonomy: Classifications of plants, animals, rivers, lakes, mountains and other parts of a people's world

Heritage variety seeds: Local, farmer developed cultivars which have been collected and are being preserved through in situ growing. These are preserved, selected and passed down through the generations on farms and in community and backyard gardens. They may be traded informally among farmers or in seed exchange programs in which more widespread in situ preservation is ensured, such as in seed fairs or other seed exchange programs, including internet coordinated programs such as occurring in the United States. See also landrace.

Higher Yielding Varieties (HYV): Seeds which produced in laboratories of agricultural stations using scientific knowledge. These are usually hybred or genetically engineered, proprietary, and distributed through market mechanisms for profit. It

is intentionally misleading to speak of them as "high yielding" as local land races might be higher yielding within the context that they are bred for. They tend to be designed to provide uniform yields given the application of high inputs in the form of chemical fertilizers and insecticides, often proprietary, and uniform amounts of water. Without these inputs they may do much more poorly than locally bred landraces under local conditions. See also landrace, heritage varieties, seed exchange

Indigenous knowledge: Locally rooted, based in experiences of local peoples, constantly in flux. Orally transmitted. Learned as part of acculturative process. Socially differentiated, often transferred by cultural specialists or with specific location within the social system. It is holistic, which means that it integrates into all parts of people's social experience.

Indigenous people: People with strong autochthonous local ties to an area in the form of language, culture, subsistence, property forms, socioeconomic relations, symbols and rituals. Due to an organic development of their culture in close association with other natural and human communities over long periods of times, they generally have an interest in sustaining the predominant natural conditions.

Innovation: Reconfiguring local techniques and technologies with materials at hand—material, social and ideational.

Land race: A population of individuals that have become adapted to a specific environment in which it has been planted—specifically, in the context of agriculture, local, farmer-developed cultivars.

Knowledge: ideas, perceptions and memories with which people capture and engage with reality. See also scientific knowledge

Natural Resources Management: Attempts of people to intervene in natural and social relations to control natural processes in the environment. Generally works under the flawed assumption that people can understand and regulate the factors involved in natural processes. Critique has been that natural processes are so complex that it is impossible to sufficiently understand the interaction of all the factors for humans to "manage" the environment. A modification of resource management that recognizes the complexity of nature and promotes working in terms of nature's own rules is agroecology.

Participation: Involvement of local people and empowerment of them through it. Should be differentiated from programmatic participation, in which participatory techniques are used in order to get involvement of local people in pre-designed programs.

Praxis: Metabolism with nature and exchange in markets, as guided by the corpus of knowledge.

Scientific knowledge: Knowledge which is decontextualized, secular, institutionally based in universities and research labs recorded and transferred through written mediums. It aims for objectivity through controls and systematic exclusion of the practitioner from its purview. It is analytic and reductionist as opposed to wholistic. *See also* knowledge.

Seed exchange: The process by which farmers have maintained and developed cultivars *in situ* through reciprocal sharing. Many organizations are developing nowadays to spread this process, in many places using the internet, over large areas in order to preserve cultivars in the face of genetic erosion due to destruction of small-hold agriculture, biopiracy, hybrid creation, genetic engineering, concentration of corporate control over seeds and the associated subsidization and promotion of monoculture agri-business.

Social construction: The idea that knowledge and associated institutions are created as a result of specific historical processes, according to particular interests within society, and not through natural cultural-evolutionary tendencies.

Technology: Means of application of knowledge.

Top-down Transfer Technology (T0T): Technology introduced through specialized, outside institutions without consultation with farmers in the process. Due to lack of integration into local systems it has led to detrimental impacts on environment, decreasing biodiversity and growing dependence of farmers, who are turned into passive users.

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Participatory Technology Development Working Papers

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1. Experiences with Farmer Experimental Design Workshop in Egypt. By Jean Marie Diop and Peter Laban

<http://www.ileia.org/Themes/ptdwp1/toc.asp>

2 Farmer Experimental Design Workshop for the LEINUTS project in Kenya. By Jean-Marie Diop and Davis Onduru

<http://www.ileia.org/Themes/ptdwp2/toc.asp>

3 Trying out PTD with NGOs in Peru and Bolivia. By Henk de Zeeuw

<http://www.ileia.org/Themes/ptdwp3/toc.asp>

4 Building capacity in participatory approaches. By Jean-Marie Diop, Marga de Jong, Peter Laban and Henk de Zeeuw

<http://www.ileia.org/Themes/ptdwp4/toc.asp>

5 Participatory Technology Development in Cameroon: the route and milestones in the process of its institutionalisation. By Paul Tchawa, Félix Nkapemin and Jean-Marie Diop

<http://www.ileia.org/Themes/ptdwp5/toc.asp>

6 Towards sustainable development in Mahaweli settlements through farmer participation. By G D Perera and Bert Sennema

<http://www.ileia.org/Themes/ptdwp6/toc.asp>

7 PTD for Sustainable Dryland Agriculture in South India: Balancing our way to scale

Y.D. Naidu and Edith van Walsum

<http://www.ileia.org/Themes/ptdwp7/toc.asp>

8 Participatory Evaluation with Pastoralists in Eastern Sudan

Almotalib Ibrahim, Sara Pantuliano, John Plastow, Wolfgang Bayer and Ann Waters-Bayer

<http://www.ileia.org/Themes/ptdwp8/toc.asp>

WEBSITES

Centre for Information on Low External Inputs Sustainable Agriculture (LEISA)

<http://www.ileia.org>

ILEIA is an independent organization with the mandate to contribute to poverty alleviation through the promotion of agro-ecological approaches.

Compas Newsletter for Endogenous Development

http://www.etcint.org/compas_news1.htm

COMPAS (Comparing and Supporting Endogenous Development) is an international programme, designed to understand the diversity of rural people's knowledge, encourage local experimentation within farmers' worldviews and to have inter-cultural dialogues on farmers' knowledge and indigenous learning.

Cornell International Institute for Food, Agriculture and Development

<http://ciifad.cornell.edu/>

With partners in Africa, Asia and Latin America, initiates and supports innovative programs that contribute to improved prospects for global food security, sustainable rural development and environmental conservation around the world.

Indigenous Knowledge and Development Monitor

<http://www.nuffic.nl/ciran/ikdm/>

The Indigenous Knowledge and Development Monitor was a journal that served the international development community and all scientists who share a professional interest in indigenous knowledge systems and practices (IKSP).

Indigenous Knowledge Worldwide: Linking Global and Indigenous Knowledge

<http://www.nuffic.nl/ik-pages/ikww/index.html>

Newsletter with focus on Indigenous Knowledge (with a special attention to the relation with higher education).

International Development Research Centre

<http://web.idrc.ca/>

A public corporation created by the Parliament of Canada in 1970 to help developing

countries use science and technology to find practical, long-term solutions to the social, economic, and environmental problems they face.

PARC Guidelines

<http://www.parcinfo.org/guidlines.asp?mode=PRA+and+PLA+techniquesPTDDOC>: Search for Participatory Technology Development in ILEIA's bibliographic database

<http://ileia.cust.iaf.nl:8080/PTDDOC.html>

Research Center on Rural Agriculture and Forestry

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

To facilitate the integration of urban agriculture in the policies and programmes of national and local governments, technical departments, research centres and NGO's and to facilitate the formulation of projects on urban agriculture with active involvement of all local stakeholders.

PRA AND PLA TECHNIQUES

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http://www.gtz.de/listra/documents/module/innov_e.pdf

WEBSITES

ETC Group

<http://www.etcgroup.org/main.asp>

Dedicated to the conservation and sustainable advancement of cultural and ecological diversity and human rights.

Soil, Microbes & the Environment Research Section

<http://www.wye.ic.ac.uk/sme/projects/soil/index.htmlscope>

Topics in Sustainable Agriculture

<http://www.ocf.berkeley.edu/~tselby/>

To discuss general issues surrounding sustainable agriculture, and to do so in a way that is informative and helpful to both the general public and to academia. This home page is focused on issues surrounding the application of sustainable agricultural systems to the Third World.

BIODIVERSITY AND BIOPIRACY

PUBLICATIONS

Aoki, Keith. 1998. Neocolonialism, Anticommons Property, and Biopiracy in the

(Not-So-Brave) New World International Intellectual Property Protection (from Symposium - Sovereignty and the Globalization of Intellectual Property). 6 Ind. J. Global Leg. Stud. 11

<http://www.law.uoregon.edu/faculty/kaoki/site/articles/notesobrave.pdf>

Gollin, Michael A., J.D. 2001. Biopiracy: The Legal Perspective. Feb.

<http://www.actionbioscience.org/biodiversity/gollin.html>

Bioprospecting, or collecting biological samples, can help medical and other scientific research. However, biopiracy, or illegal collection, can: infringe on the sovereign rights of nations, decrease the economic health of indigenous communities, and deplete or destroy species.

Shiva, Vandana. 1997. Biopiracy The Plunder of Nature and Knowledge. Boston: South End Press.

WEBSITES

Biodiversity Index Page: Actionbioscience.org

<http://www.actionbioscience.org/biodiversity/index.html>

Many articles on biodiversity issues.

Biodiversity Web

<http://www.biodiversity.nl/>

Your clearing house for information dimensions of biodiversity

Biopiracy and Patenting Issues

<http://www.sacredearth.com/ethnobotany/news/patindex.htm>

Biopiracy, TRIPS, and the Patenting of Asia's Rice Bowl: A Collective NGO Situationer on IPRs on Rice

<http://www.grain.org/publications/reports/rice.htm>

WTO memberstates must recognise that farmers' and community rights have precedence over intellectual property rights and that IPRs destroy biodiversity. Many initiatives to develop and implement farmers' and community rights are underway in Southeast Asia, and must be supported and strengthened.

CAMBIA Intellectual Property Resource

<http://www.cambiaip.org/Home/welcome.htm>

Our goal is to facilitate a productive and strategic approach to identifying and addressing intellectual property issues relevant to biotechnology in international agriculture and health sciences. A key objective is to enhance the ability of public sector and small-to-medium enterprises to develop biotechnologies for crop improvement worldwide.

Centre for Law and Genetics

<http://lawgenecentre.org/categories.php?pg=113>

The mission of the Centre is to provide excellence in research for the benefit of the Australian and International communities into the legal and ethical issues arising from the developments in genetic technology and to propose effective and equitable means for developing, applying and benefit-sharing of this technology.”

Convention on Biological Diversity

<http://www.biodiv.org/default.aspx>

Genetic Resources Action International (GRAIN)

<http://www.grain.org/front/index.cfm>

Genetic Resources Action International (GRAIN) is an international non-governmental organisation which promotes the sustainable management and use of agricultural biodiversity based on people’s control over genetic resources and local knowledge.

Global Biodiversity Forum

<http://www.gbf.ch/>

The Global Biodiversity Forum (GBF) was founded in 1993 by IUCN, WRI, UNEP, and ACTS and includes a number of other institutions as its convenors. It is an open and independent mechanism to encourage analysis, dialogue and partnership on key ecological, economic, social and institutional issues related to biodiversity. It contributes to the further development and implementation of the Convention on Biological Diversity (CBD), the Ramsar Convention, the Framework Convention on Climate Change, the Convention to Combat Desertification and other biodiversity-related conventions at the local, national, regional and international levels.

Indigenous and Aboriginal Peoples Website

http://www.cnsr.com/pivy/Indigenous_links.htm

International Centre for Bioethics, Culture and Disability

<http://www.bioethicsanddisability.org/start.html>

Indigenous People and Biopiracy

<http://www.thalidomide.ca/gwolbring/bio.htm>

Indigenous Peoples Biodiversity Information Network

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

The Indigenous Peoples Biodiversity Information Network (IBIN) is a mechanism to exchange information about experiences and projects and to increase collaboration among indigenous groups working on common causes related to biodiversity use and conservation.

Primal Seeds

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

Primal Seeds exists as a network to actively engage in protecting biodiversity and creating local food security. It is a response to industrial biopiracy, control of the global seed supply and of our food. This evolving tool is designed to empower individuals to participate in the creation of tomorrow.

UK Agricultural Biodiversity Forum

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

PARTICIPATION**CSOPP Documents: Empowering People - A Guide to Participation**

<http://www.undp.org/csopp/CSO/NewFiles/docemppeople.html>

IDS Participation Home Page

<http://www.ids.ac.uk/ids/particip/>

Provides many documents and resources on participation

Links to sites on participation and related issues: FPR-IPM Task Force, CGIAR Systemwide IPM Program

<http://www.ciat.cgiar.org/fpr-ipm/participation.html>

Although it is on CGIAR's integrated pest management website, it has a pretty exhaustive listing of participation-related websites.

World Bank: Learning Program on Participatory Processes on PRSP

<http://www.worldbank.org/participation/web/index.htm>

This is an interactive learning tool on participatory processes at the national level for the PRSP and other government strategies and actions to reduce poverty. It is currently under development. It is designed to provide staff from country governments, World Bank and the Fund, and civil society leaders guidance on participatory processes and outcomes at the national level through the 4 building blocks:

PARTICIPATORY EVALUATION AND MONITORING**PUBLICATIONS**

Davis-Case, D'Arcy. 1989. Community Forestry: Participatory Assessment, Monitoring and Evaluation. 1998 reprint. Rome: FAO.

<http://www.fao.org/DOCREP/006/T7838E/T7838E00.HTM>

Rolf Sartorius. Participatory Monitoring and Evaluation Systems: Improving the Performance of Poverty Reduction Programs and Building Capacity of Local Partners

<http://rrojasdatabank.net/wbpover/06Rolf-Latest.pdf>

Vernooy, Ronnie, Sun Qiu, and Xu Jianchu, eds. *Voices for Change: Participatory Monitoring and Evaluation in China*. Ottawa: International Development Research Centre.

http://web.idrc.ca/ev_en.php?ID=32193_201&ID2=DO_TOPIC

Guide for Participatory Appraisal, Monitoring and Evaluation

<http://www.gtz.de/ecosan/download/Mvula-guide-participatory-appraisal.pdf>

The intention of this guide is to familiarise community development workers with the knowledge and skills required for using participatory development methodologies. This guide should be seen as a reference and resource manual that will help guide development workers new to this field. This manual should preferably be introduced to development workers with a significant experiential training programme facilitated by skilled development workers / trainers. This guide provides the basis for understanding participatory methodologies and we encourage the reader to explore other texts listed in the reference section at the end of this document. However, nothing can teach these approaches better than a mentored p

WEBSITES

Eldis Participation Resource Guide: Participation and Monitoring

<http://www.eldis.org/participation/pme/index.htm>

How do organisations accurately determine whether they are progressing towards, or achieving their goals and objectives? And who should be making these judgements? Increasing calls for accountability, efficiency and improved management performance have led to a more intense focus on the monitoring and evaluation stage of the project cycle, including feedback of results into the planning process. Participatory Monitoring and Evaluation (PM&E) promotes the involvement of a wide range of stakeholders, employing methods that allow a more equal opportunity for the expression of views and sharing of lessons.

FRAME: Participatory Evaluation and Monitoring Tools

http://www.frameweb.org/ev.php?ID=6346_201&ID2=DO_TOPIC

Monitoring and Evaluation News

<http://www.mande.co.uk/>

A news service focusing on developments in monitoring and evaluation methods relevant to development projects and programmes with social development objectives.

NRM Changelinks: Participatory Monitoring and Evaluation (PM&E)

http://nrm.massey.ac.nz/changelinks/par_eval.html

Links to approaches, case studies, tips, guides and handbooks, improving

environmental monitoring, measuring social capital and community development, evaluating information technologies, other (unclassified) resources, as well as a tongue-in-cheek “62 good reasons for avoiding evaluation.”

PARC Guidelines: Natural Resources Evaluation

<http://www.parcinfo.org/guidlines.asp?mode=Natural+resources+evaluation>

Participatory Evaluation

<http://www.people.cornell.edu/pages/alr26/parEval.html>

Welcome to a webpage designed to serve as a guide and entry way to some of the many resources on the subject of participatory evaluation. Whether you simply want to include more stakeholders in an assessment process, or you seek to create a just, democratic and sustainable world, useful materials await a click away.

Participatory Evaluation

<http://trochim.human.cornell.edu/gallery/Coffin/home.htm>

Has links to what it is, how it is done, what other organizations have done and additional readings.

Participatory Evaluation Bibliography compiled by Nancy Grudens

<http://www.ageds.iastate.edu/personne/nancypdfs/PartcpEval.pdf>

Participatory Monitoring and Evaluation Bibliography

http://web.idrc.ca/en/ev-3266-201-1-DO_TOPIC.html

This page provides a very selective list of annotated/abstracted references.

Participatory Monitoring and Evaluation (Bibliographies)

http://www.idrc.org.sg/en/ev-3242-201-1-DO_TOPIC.html

Readings, manuals, bibliography, links

Participatory Monitoring and Evaluation: Learning from Change. IDS Policy Briefing 12 (Nov. 1998).

<http://www.ids.ac.uk/ids/bookshop/briefs/brief12.html>

Institute of Development Studies. (November, 1998). Participatory monitoring and evaluation: Learning from change. IDS Policy Briefing Issue www.ids.ac.uk/ids/bookshop/briefs/brief12.html. (Accessed 10/12/00).

Publications on Line: In Participatory Evaluation and Participation (bibliography of web resources from IUDC)

<http://www.ucm.es/info/IUDC/Publicaciones.htm>

UNDP India: Monitoring and Evaluation Strategy

<http://www.undp.org.in/MnE/whatM&E.htm>

Compare conventional M&E and PM&E, program and project level, India strategy, outcome level, software, handbook, results based management, and links and

references

World Bank Poverty Net Library: Participatory Evaluation

<http://poverty.worldbank.org/library/topic/3373/5463/>

World Bank: Participation in Monitoring and Evaluation: References

<http://www.worldbank.org/participation/web/webfiles/pmeref.htm>

NATURAL RESOURCE MANAGEMENT AND AGROECOLOGY***PUBLICATIONS***

Altieri, Miguel A., Nd. Agroecology: The Science of Natural Resource Management for Poor Farmers in Marginal Environments. Department of Environmental Science Policy and Management, UC Berkeley. Electronic Manuscript.

<http://agroeco.org/brasil/material/nrm.htm>

Altieri, Miguel A. N.d. Designing a natural resource management strategy for poor farmers in marginal environments. UC Berkeley. Electronic manuscript.

http://ciat-library.ciat.cgiar.org/paper_pobreza/005.pdf

Altieri, Miguel A. and Jean-Marc von der Weid. Nd. Prospects for Agroecologically Based Natural-Resource Management for Low-Income Farmers in the 21st Century. University of California, Berkeley — NGOC/CGIAR and Jean-Marc von der Weid, AS-PTA, Brasil — GFAR-SC.

<http://nrm.massey.ac.nz/changelinks/>

An on-line resource guide for those seeking to improve the use of collaborative and learning-based approaches

WEBSITES

Agroecology in Action

<http://agroeco.org/>

Exhaustive collection of resources, articles and links relating to agroecology. Includes agroecology and pest management, biodiversity, small farmers in the developing world, modern agriculture, and interviews. NRM Changelinks: Improving Community Participation in Environment and Development (links for developing change in Natural Resource Management)

ETHNOBOTANY

Centre for International Ethnomedical Education and Research

www.cicer.org/

The Centre for International Ethnomedical Education and Research is a non-profit educational and research organization developed to establish a focal point for the exchange of ethnomedicinal knowledge and to establish an international

network of ethnobotanical researchers. The site features bibliographies, databases, publications, online courses, research projects, a web directory, and more pertaining to medicinal plants.

Gray Card Index

www.herbaria.harvard.edu/data/gray/

This database of the Harvard University Herbaria catalogues over 325,000 citations of names of New World vascular plants.

Guide to Economic Botany Links

<http://www.rbgekew.org.uk/scihort/eblinks/>

It is designed to answer some of the queries received at the Centre for Economic Botany, Royal Botanic Gardens in Kew, UK, about useful and poisonous plants, and to act as a resource for the wider ethnobotanical community, particularly students. Coverage focuses on sites that are information-rich and current, and includes significant coverage of medicinal plants.

Herb walk

www.herbwalk.com/

Herbwalk.com is an online community where people talk about herbs. The site contains also a discussion forum on herbs for pets.

Ethnopharmacologist: Human beings and useful plants for food and medicine

<http://www.netcologne.de/~nc-pieronan2>

This site of Ethnopharmacologist Andrea Pieroni focuses on natural foods and herbs, medicinal plants, and their use by different peoples. The site also offers information on publications and conferences.

Medicinal Plants for Livestock

<http://www.ansci.cornell.edu/plants/medicinal>

Established by the Animal Science Department of Cornell University in the USA, this site focuses on medicinal plants for livestock and discusses topics such as their safety and efficacy.

Operated by the Natural Products Alert (NAPRALERT)

www.ag.uiuc.edu/~ffh/napra.html

Project (NAPRALERT) at the Department of Pharmacognosy and Pharmacology, College of Pharmacy, University of Illinois, USA, this website offers a computerised database on the chemistry and pharmacology of natural medicinal materials. The database is available for a fee from the Scientific and Technical Information Network.

PRELUDE

<http://pc4.sisc.ucl.ac.be/prelude.html>

The PRELUDE network (Programme for Research and Link between Universities for Development) aims to link researchers from different backgrounds (University and Non-University) in a spirit of partnership with the various participants of co-development. The site includes a large database on African medicinal and veterinary plants.

SEPASAL

<http://www.rbgekew.org.uk/ceb/sepasal/internet/>

Operated by the Royal Botanic Gardens in Kew, UK, this website features a database derived from the Survey of Economic Plants for Arid and Semi-Arid Lands (SEPASAL). The database contains information on more than 6,200 useful tropical and subtropical dryland species, excluding major crops.

Shaman

<http://www.shamanbotanicals.com/>

This is the site of Shaman, a pharmaceutical firm that develops and sells clinically tested botanical dietary supplements from tropical plants with a history of medicinal use.

Society of Medicinal Plant Research

<http://www.rz.uni-duesseldorf.de/WWW/GA/Welcome.>

Site links to other pages of interest, such as the Phytochemical Society of Europe and the Society for Economic Botany.

VAST

<http://www.mobot.org/search.html>

The VAST (VAScular Tropicos) nomenclature databases can be accessed at this Missouri Botanical Garden website. The databases contain a wealth of botanical and bibliographic data collected over the last 12 years by staff, students, and visitors of the MBG, as well as information gathered by several cooperative and other projects and institutions.

INDIGENOUS KNOWLEDGE

PUBLICATIONS

Michael Davis. 1998. Biological Diversity and Indigenous Knowledge. Science, Technology, Environment and Resources Group. 29 June 1998

<http://www.aph.gov.au/library/pubs/rp/1997-98/98rp17.htm>

WEBSITES

Africa Indigenous Science and Knowledge Systems

<http://members.aol.com/Afsci/africana.htm>

In this site we present various perspectives on African Indigenous Knowledge

Systems(AIK) from a wide range of scholars. We publish brief extracts from scholarly works on the subject and focus on several areas.

Best Practices on Indigenous Knowledge

<http://www.unesco.org/most/bpindi.htm>

The Netherlands Organization for International Cooperation in Higher Education / Indigenous Knowledge (NUFFIC/IK-Unit) (1) in co-operation with UNESCO's Management of Social Transformations Programme (MOST) has established a Database of best practices on indigenous knowledge in 1999 which initially contained 27 best practices. Through the second phase (2001-2002), 22 cases were newly added to the database

Biodiversity, Access, Indigenous Knowledge and IPRS

<http://www.twinside.org.sg/access.htm>

Anthro Net: Indigenous Knowledge and Cultural Survival

<http://home1.gte.net/ericjw1/indigenous.html>

Center for Indigenous Knowledge for Agriculture and Rural Development (CIKARD)

http://www.public.iastate.edu/~anthr_info/cikard/

The Center for Indigenous Knowledge for Agriculture and Rural Development (CIKARD) maintains this website out of Iowa State University in Ames, Iowa, USA. Established in October 1987, CIKARD focuses on preserving and applying the local knowledge of rural peoples worldwide and on facilitating participatory and sustainable approaches to development. The CIKARD site contains a facility for searching an extensive database of abstracts on indigenous knowledge.

Centre for International Research and Advisory Networks (CIRAN)

<http://www.nuffic.nl/ciran/ik-pages>

Located in the Netherlands, CIRAN (Centre for International Research and Advisory Networks) facilitates and improves the exchange of information. CIRAN coordinates the International Indigenous Knowledge Network, produces the Indigenous Knowledge and Development Monitor, and is collaborating with UNESCO in building up the MOST database on best practices. The Monitor and the MOST database can be accessed from the above address.

Community Guide to Protecting Indigenous Knowledge (downloadable PDF)

http://www.ainc-inac.gc.ca/pr/ra/ind/gui_e.pdf

Honor the Earth: Indigenous Knowledge and Environmental Justice (Native American)

<http://www.honorearth.org/ejik.html>

Indigenous Agricultural and Environmental Knowledge Systems

<http://www.ciesin.org/TG/AG/iksys.html>

Indigenous Knowledge

<http://www.big-world.org/links/62.asp>

An annotated list of key on-line sources which focus on how ICTs (Information and Communication Technologies) are being used to capture and exchange indigenous knowledge.

Indigenous Knowledge and Development Monitor

<http://www.nuffic.nl/ciran/ikdm/>

Indigenous Knowledge Development Gateway

<http://www.developmentgateway.org/node/130646/>

The Development Gateway Foundation is an enabler of development. We help improve people's lives in developing countries by building partnerships and information systems that provide access to knowledge for development

Indigenous Knowledge Gateway Page

<http://library.antiochne.edu/LIBPAGE/Envstudies/indigenous>

Indigenous Knowledge Pages

<http://www.nuffic.nl/ik-pages/>

Your gateway to Indigenous Knowledge. This website contains a database on Indigenous Knowledge, conferences, calls, good practices, etc.

Indigenous Knowledge Systems

<http://www.ankn.uaf.edu/iksgraph.html>

The information and links listed under this site are selected to provide a comprehensive picture of ways in which Native people have come to understand and relate to the environment in which they live and the scientific implications of traditional knowledge in the contemporary world.

Indigenous Knowledge Systems (Online Newsletter)

<http://www.nrf.ac.za/focusareas/iks/>

Indigenous Knowledge Systems in India

http://www.dst.gov.za/programmes/indigenous_knowledge/India_visit_2K_rpt/main.htm

Indigenous Knowledge Systems List (INDKNOW)

<http://twm.co.nz/indigen.html>

INDKNOW@u.washington.edu is a forum for discussing issues associated with indigenous knowledge systems and traditional ecological knowledge. INDKNOW will carry notices about publications, projects, ideas and questions

of individuals and groups working to understand, validate and apply indigenous knowledge systems and traditional ecological knowledge; to promote the use of indigenous knowledge as complementary to the scientific tradition; to expedite the obligations of States to support IKS under provisions contained in Agenda 21, the Biodiversity Convention, and other international agreements and conventions applying to indigenous peoples; to work for protection of IK and just compensation to communities for their knowledge; to support the international Indigenous Knowledge and Development (IK&D) network consisting of more than 2500 participants in 106 countries worldwide; and to facilitate the growing number of formally established indigenous knowledge resource centers.

Indigenous Knowledge Worldwide

<http://www.nuffic.nl/ik-pages/ikww/index.html>

Indigenous Peoples Biodiversity Information Network

<http://www.ibin.org/Index.htm>

The Indigenous Peoples Biodiversity Information Network (IBIN) is a mechanism to exchange information about experiences and projects and to increase collaboration among indigenous groups working on common causes related to biodiversity use and conservation.

Indigenous Resources on the Internet

<http://www.undp.org/info21/sector/s-c-indi.html>

Recording and Using Indigenous Knowledge: A Manual

<http://www.panasia.org.sg/iirr/ikmanual/>

This practical, user-friendly manual is the first to describe how to record and assess indigenous knowledge together with local people, identify promising forms of knowledge, and integrate them into development activities. It outlines more than 30 different recording and assessment methods drawn from participatory appraisal, anthropological, sociological and community organizing approaches. For each method, it gives a brief definition and purpose, lists the materials needed, gives a step-by-step approach on how to implement it, describes its value, and lists some dos and don'ts based on practical field experience.

SouthAsia.Net: Indigenous Knowledge

http://southasia.net/Research_Development/Indigenous_Knowledge/

SRISTI

<http://csf.colorado.edu/sristi>

SRISTI is an NGO that works to strengthen the creativity of grassroots inventors, innovators, and eco-entrepreneurs engaged in conserving biodiversity and developing environmentally friendly solutions to local problems. SRISTI produces

the Honey Bee Newsletter.

Trade Issues, Rules, and WTO

<http://www.twinside.org.sg/trade.htm>

This section is on WTO issues and current developments. It is a speciality of the TWN website. You will find current news and in-depth analysis of the WTO negotiations and the WTO agreements, from the perspective of developing countries. Documents are placed in the following categories: (Special): Negotiations and news on the Seattle Conference; (Special) Selection of the Director-General; (B) General trade issues; (C) General investment issues; (D) General WTO issues; (E) Uruguay Round Agreements; (F) WTO "New Issues"; (G) Previous WTO conferences; (H) Dispute Settlement System; (I) MAI/OECD process. (J) NGO views and activities on the WTO, MAI and others.

World Bank Indigenous Knowledge Program

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

The Indigenous Knowledge (IK) Program's website opens a gateway to different sources on IK. It aims to facilitate a multilateral dialogue between local communities, NGOs, governments, donors, civil society and the private sector. The ultimate objective of the website is to help mainstream indigenous/traditional knowledge into the activities of development partners and to optimize the benefits of development assistance, especially to the poor.

World Bank Indigenous Knowledge Database

<http://www4.worldbank.org/afr/ikdb/search.cfm>

World Bank's Indigenous Knowledge Initiative

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

This initiative seeks to help WB partners learn more about local knowledge and technology in the WB's client countries, the better to adapt global knowledge to local conditions and design activities that meet country-specific needs.