

Trainer's Manual on  
**Agricultural Extension  
and Land Management**



Department of Agriculture  
**UPLAND DEVELOPMENT PROGRAMME  
(IN SOUTHERN MINDANAO) (UDP)**



Philippine - European Union  
Development Cooperation



Department of Agriculture  
**AGRICULTURAL TRAINING INSTITUTE**

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7. University of Southeastern Philippines
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9. Mindanao State University - General Santos City Campus
10. Municipal Local Government Unit of Lupon, Davao Oriental
11. National Commission on Indigenous Peoples
12. Provincial Local Government Unit of Compostela Valley
13. Provincial Local Government Unit of Davao del Norte
14. Provincial Local Government Unit of Davao del Sur
15. Provincial Local Government Unit of Davao Oriental
16. Provincial Local Government Unit of Sarangani
17. Provincial Local Government Unit of North Cotabato
18. Provincial Local Government Unit of South Cotabato
19. Provincial Local Government Unit of Sultan Kudarat
20. Southern Philippines Agribusiness and Marine and Aquatic School of Technology
21. Sultan Kudarat Polytechnic State College
22. Surallah National Agricultural School
23. University of Southeastern Philippines
24. Upland Development Programme in Southern Mindanao
25. World Agroforestry Centre (ICRAF)
26. CBET and Learning Site of Kinabalan, Malungon, Sarangani
27. CBET and Learning Site of Lake Seloton, Lake Sebu, South Cotabato
28. CBET and Learning Site of Lapuan, Don Marcelino, Davao del Sur
29. CBET and Learning Site of Poblacion, Tantangan, South Cotabato
30. CBET and Learning Site of Lampitak, Tampakan, South Cotabato
31. CBET and Learning Site of Pitu, Malalag, Davao del Sur
32. CBET and Learning Site of San Isidro, Nabunturan, Compostela Valley
33. CBET and Learning Site of Taguibo, Mati, Davao Oriental
34. CBET and Learning Site of Tibulao, Carmen, Davao del Norte

## III. Publication phase

Upland Development Programme in Southern Mindanao

## ACRONYM

ABC	Association of Barangay Captains
AFE	Agriculture and Fishery Extension
AFMA	Agriculture and Fishery Modernization Act
AIP	Annual Investment Plan
AT	Agricultural Technologist
ATI	Agricultural Training Institute
BDC	Barangay Development Council
BDP	Barangay Development Plan
BEW	Barangay Extension Worker
BLGU	Barangay Local Government Unit
CBEDS	Community-Based Extension Delivery Scheme
CBET	Community-Based Extension Team
CBL	Constitution and By- Laws
CBO	Community-Based Organization
CIDE	Community and Institutional Development and Extension
CM	Computer Mediated Communication
CO	Community Organizing/ Community Organizer
DA	Department of Agriculture
DA-RFU	Department of Agriculture Regional Field Unit
DAP	Development Academy of the Philippines
DLR	Department of Land Reform
DFS	Diversified Farming System
DNSC	Davao del Norte State College
DOSCST	Davao Oriental State College of Science and Technology
DOST	Department of Science and Technology
ELA	Executive Legislative Agenda
EU	European Union
FA	Farmers Association
FBE	Farmer Based Extension
FGD	Focus Group Discussion
FFL	Farmers First and Last
FFS	Farmers Field School
FLE	Farmer- Led Extension
FTG	Farmers Training Group
GO	Government Organization
ICT	Information and Communication Technology
ICRAF	World Agroforestry Centre (International Centre for Research in Agroforestry)
IEC	Information, Education and Communication
IFS	Integrated Farming System
IP	Indigeneous Peoples
K-AGRINET	Knowledge Networking Towards Enterprising Agricultural Communities
LGU	Local Government Unit
LS	Learning Site
LSB	Local Special Body
LUB BDP	Land Use-Based Barangay Development Plan

LUP	Land Use Plan
MA	Municipal Agriculturist
MAO	Municipal Agriculture Office
MENRO	Municipal Environment and Natural Resource Office
MLGU	Municipal Local Government Unit
MSU	Mindanao State University
NGO	Non-Government Organization
NRM	Natural Resource Management
NVS	Natural Vegetative Filter Strips
OPAg	Office of the Provincial Agriculturist
PA/PAgrO	Provincial Agriculturist/Provincial Agricultural Officer
PCARRD	Philippine Council for Agriculture, Forestry and Natural Resources Research and Development
PLGU	Provincial Local Government Unit
PME	Participatory Monitoring and Evaluation
PPO	Provincial Project Office
RRDEN	Regional Research and Development and Extension Network
SAD	Sustainable Agriculture and Development
SALT	Sloping Agricultural Land Technology
SEARCA	SEAMEO Regional Center for Graduate Study and Research in Agriculture
SI	Slope Indicator
SKPSC	Sultan Kudarat Polytechnic State College
SPAMAST	Southern Philippines Agribusiness and Marine and Aquatic School of Technology
STOP	Slope Treatment Oriented Practices
SUCs	State Universities and Colleges
SUD	Sustainable Upland Development
SUNAS	Surallah National Agricultural School
SWC	Soil and Water Conservation
TOT	Training of Trainers
UBA	Upland Barangay Association
UCO	Upland Community Organization
UDP	Upland Development Programme in Southern Mindanao
USEP	University of Southeastern Philippines

## FOREWORD

In the Philippines, as in many countries in Southeast Asia, unregulated deforestation consequently opened vast forestlands to unsustainable agriculture. This reality and its devastating effect to land and natural resources has become an issue extending beyond local and political boundaries.

In its six years of modeling for sustainable upland development, the Upland Development Programme in Southern Mindanao or UDP, a special project of the Department of Agriculture supported by the European Union, confirmed the need for massive adoption and application of appropriate land management, soil and water conservation methods and approaches, and farming systems that will enhance existing farms and prevent further encroachment. To achieve this, an effective upland agricultural extension delivery scheme must be installed.

This Trainer’s Manual on Agricultural Extension and Land Management aims to support the Agricultural Training Institute in implementing capacity building that will appropriately prepare Agricultural Technologists or ATs for upland work. It outlines highly participatory and hands-on learning methodologies for effective knowledge and skills enhancement.

It is hoped that through this material, ATI and its trained regional and provincial training pool will be able to carry out more effective trainings for ATs and Municipal Agriculturists.



DASHIEL P. INDELIBLE  
National Co-Director  
UDP



WIEBE VAN RIJ  
European Co-Director  
UDP

## FOREWORD

For years, the forests of Southern Mindanao have provided life support to both upland and lowland communities. However, indiscriminate slash and burn farming and unsustainable farm practices have endangered our upland resource base.

Thus, I laud the Upland Development Programme or UDP, a special project of the Department of Agriculture, funded by the European Union, for its tireless efforts in saving the uplands. Indeed, the Programme has shown unwavering commitment in improving and rehabilitating the upland resource base, as well as in uplifting the lives of the rural communities who derive most of their income from upland farming.


In fact, the production of this Trainer's Manual on Agricultural Extension and Land Management underscores the Programme's underlying dedication to the preservation and rehabilitation of upland resources.

This Manual, which is a collaborative activity of the UDP, the Agricultural Training Institute, the World Agroforestry Centre, and other Programme partners, showcases appropriate land management, farming systems and participatory, community-based extension interventions that will guide extension workers in helping upland communities improve their existing farms while protecting and healing the land resource.

Hopefully, this will usher a greener and brighter tomorrow for the upland communities.

Mabuhay ang Agrikultura!

Mabuhay ang magsasakang Pilipino!



ASTERIO P. SALIOT, MNSA, CESO III  
Director, Agricultural Training Institute

## ABOUT THIS MANUAL

This Manual is an application of Theory and Practice in Community-Based Extension Delivery and Land Management as experienced and practiced by the Upland Development Programme in Southern Mindanao. It is a training tool with particular biases on participatory, community-based extension delivery system and land and natural resource management as basic foundation of Sustainable Upland Development.

The preparation of this manual took a number of phases, namely, modules development, pretest and utilization of the modules on Training of Trainers (TOT) course, and publication.

The **modules development phase** was the writing of the modules and session guides by the Upland Development Programme in Southern Mindanao and the World Agroforestry Centre, followed by an enhancement workshop with the participation of the Agricultural Training Institute, central office and Regions XI and XII, the University of Southeastern Philippines, the Local Government Units of the South Cotabato Province, the Municipality of Malapatan in Sarangani, and the Municipality of Laak in Compostela Valley.

The **pretest and utilization phase** on TOT assessed the practicability of the modules and session guides during a Training of Trainers (TOT) on Agricultural Extension and Land Management participated in by 37 trainers coming from the Department of Agriculture-Regional Field Unit and ATI, Regions XI and XII, Mindanao State University-General Santos City Campus, University of Southeastern Philippines, Southern Philippines Agribusiness and Marine and Aquatic School of Technology, Sultan Kudarat Polytechnic State College, Surallah National Agricultural School, Davao del Norte State College, National Commission on Indigenous Peoples-XII, the Provincial Local Governments of Davao Oriental, Davao del Norte, Davao del Sur, Sarangani, South Cotabato, Sultan Kudarat, North Cotabato, Municipality of Lupon and the Local Government of Davao City.

Utilization test took six months through nine batches of AT trainings that covered eight provinces and one city, in both Regions XI and XII.

The **publication phase** was the production and wider distribution of final copies of modules, session guides and handouts as enriched or revised based on the results of the pretest and utilization phase.

Copies of this training guide may be accessed through the Agricultural Training Institute in Quezon City and in Regions XI and XII.

# ACKNOWLEDGMENTS

UDP is especially thankful that the Agricultural Training Institute has mainstreamed into its regular program the capacity building support to Sustainable Upland Development.

The Programme commends the invaluable contribution of the following partners in the development, utilization test and enhancement of the modules:

*Agricultural Training Institute-National  
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*World Agroforestry Centre (ICRAF);*

*University of Southeastern Philippines,  
Davao del Norte State College,  
Southern Philippines Agribusiness and Marine and Aquatic School of Technology,  
Mindanao State University-General Santos City Campus,  
Sultan Kudarat Polytechnic State College, and  
Surallah National Agricultural School;*

*Department of Agriculture- Regional Field Unit, Regions XI and XII;*

*National Commission on Indigenous Peoples- Region XII;*

*Local Government Units of Davao Oriental, Compostela Valley,  
Davao del Norte, Davao del Sur, Sarangani, South Cotabato,  
Sultan Kudarat, North Cotabato, and Davao City;*

*The Regional and Provincial Trainers and the Agricultural Technologists who participated in the  
TOT, pretest and utilization;*

*The Learning Sites and Community-Based Extension Teams and Field Facilitators of Lake Sebu,  
Tampakan and Tantangan, in South Cotabato, Malalag and Don Marcelino, in Davao del Sur, Mati,  
Davao Oriental, Malungon, Sarangani, Carmen, Davao del Norte,  
and Nabunturan, Compostela Valley;*

*and the module writers:*

*Nelson P. Casiano, Dinah Q. Tabbada, Alexander U. Tabbada and Ben-hur R. Vilorio*

May this piece of work help strengthen the support system for Sustainable Upland Development.

# HOW TO USE THIS MANUAL

This Trainer’s Manual consists of four modules comprehensively elaborated in corresponding sessions:

MODULE	TITLE	DURATION
<b>MODULE 1</b>	<b>AGRICULTURAL EXTENSION</b>	<b>6 hours</b>
Session 1	Extension Principles and Methods	3 hours
Session 2	The Community-Based Extension Delivery Scheme	3 hours
<b>MODULE 2</b>	<b>FACILITATION</b>	<b>6 hours</b>
Session 1	Facilitation Skills and Methods	3 hours
Session 2	Facilitating the Community-Based Extension Process	3 hours
<b>MODULE 3</b>	<b>COMMUNITY ORGANIZING</b>	<b>6 hours</b>
Session 1	Community Organizing Principles and Processes	3 hours
Session 2	Organizing Communities for Land and Natural Resource Management	3 hours
<b>MODULE 4</b>	<b>LAND MANAGEMENT</b>	<b>15 hours</b>
Session 1	Soil and Water Conservation (SWC)	5 hours
Session 2	Slope Treatment Oriented Practices (STOP)	6 hours
Session 3	Diversified Farming Systems (DFS)	4 hours
	<b>Sub-total</b>	<b>33 hours</b>
	<b>PRELIMINARIES</b>	<b>3 hours</b>
	<b>TOTAL</b>	<b>36 hours</b>

Session guides contain session objectives, core messages, suggested activities to enhance participation and learning, and time allotment or duration. Training will take at least four days, 33 hours for the main topics and about 3 hours for the preliminaries, or a total of 36 hours.

This Manual is meant for **participatory methodologies and training must be conducted at the Learning Sites** (refer to module 1 session1), or on a **farmer’s/prospective adopter’s farm in areas where there is no identified Learning Site.**

Demonstrations and counter-demonstrations required in the land management module can be best done at appropriate Learning Site, while, hands-on for the participants can take place in an actual new adopter’s farm. So, it is suggested that ATI and its Regional and Provincial Trainers and other users identify 2 or 3 prospective adopters and arrange with them the



activity ahead. After the hands-on, the participants and the farmer-owner shall have drawn the existing and proposed maps, highlighting recommendations for each land unit.

For Session 2 of Modules on Extension (Module 1) and Community Organizing (Module 3), participants may interact with the Community-Based Extension Team and the appropriate Farmers/Community-Based Organization at the Learning Site, respectively.

Trainers working in small teams, especially during hands-on activities, will make every session efficient. It is very important for each member, whether sub-facilitator or main facilitator, to clarify roles, tools, methods, procedures, expected outputs, and the like. The team must take time to do a necessary walk-through, dry run and dialogue days before the activity, especially if farms for actual application are far apart, groups are big, and participants are varied.

Topics on values, attitudes and skills may need more reflection, elaboration and discussions, especially for new ATs. If there is such an intention, training design must provide for longer self awareness and values orientation sessions. Otherwise, concerned Human Resource Departments can organize a special values seminar for ATs and other employees.

Main pages provide side spaces. Facilitators may write on them notes or ideas that they especially want to emphasize or deepen in the process.

Trainers are encouraged to make enhancements and innovations on suggested methods and activities, provided these are doable and participatory, and to update session contents and handouts, as appropriate.

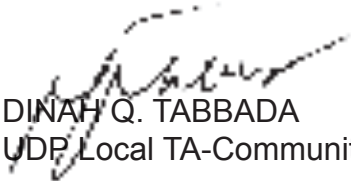
  
DINAH Q. TABBADA  
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# MODULE 1

## AGRICULTURAL EXTENSION

### Purpose of the Module

This module aims to provide an overview of the extension process, and to introduce and integrate a community-based extension approach towards sustainable agriculture.

### Sessions

This module covers TWO sessions, namely:

- 1 Extension Principles and Methods
- 2 The Community-Based Extension Delivery Scheme



**MODULE 1      AGRICULTURAL EXTENSION**

**Session 1      Extension Principles and Methods**

<b>Objectives</b>	<p>At the end of the session, the participants should be able to:</p> <ol style="list-style-type: none"><li>1. Explain the role of extension in agricultural development;</li><li>2. Discuss the basic concepts and principles of extension;</li><li>3. Describe the attributes of a good extension worker; and</li><li>4. Discuss the participatory approaches to extension.</li></ol>
<b>Suggested Methods</b>	<p>Lecture, group discussion, experiential sharing, role play or case analysis</p>
<b>Learning Materials</b>	<p>Overhead projector and transparencies, blackboard/whiteboard, chalk/whiteboard pen, manila paper, meta cards, marking pens, discussion guides, cases</p>
<b>Evaluation Methods</b>	<p>Pretest, posttest, post activity paper</p>
<b>Time Allotment</b>	<p>3.0 hours</p>

**Contents:**

- A. Meaning of Extension
- B. Purpose of/Need for Extension
- C. Principles of Extension
- D. The Clients of Extension
- E. Principles of Adult Learning
- F. Core Extension Messages
- G. Extension Methods and Approaches
- H. Qualities of a Good Extension Worker

**IMPORTANT:**

**The Resource Person further discusses the topics to emphasize or include what have been left out in the discussions based on the following details of session contents:**

**TOPIC**

**MESSAGES**

<b>Meaning of Extension</b>	<ul style="list-style-type: none"><li>• Extension is an informal and non-formal educational process that aims to raise awareness, advance understanding, and transform farmers’ attitudes towards farming practices that boost up productivity and promote management of the soil and other natural resources.</li><li>• Extension is a process of working with rural people to enable them to improve their productivity and develop their capacities to conserve, protect and manage their land and natural resources.</li><li>• Extension is an essential mechanism for delivering information and advice as an input to sustainable farming.</li><li>• In the AFMA document (1997), “<i>Extension Services</i>” refers to the provision of training, information, and support services by the government and non-government organizations to the agriculture and fisheries sectors to improve the technical, business and social capabilities of farmers and fisherfolks.</li></ul>
<b>Purpose of/Need for Extension</b>	<p>The AFMA, under Section 86, states that:</p> <p>“It is hereby declared the policy of the State to promote science and technology as essential for national development and progress. The State shall give priority to the utilization of research results through formal and non-formal education, extension and training services.”</p>

## Principles of Extension

Extension is needed:

- For government to respond to technology needs of farmers
- To facilitate implementation of government programs
- For government, non-government and people to address issues and threats to sustainable upland development together
- As education component that will enable people to participate in planned change
- To facilitate decision-making
- To mobilize communities and groups
- To link local ecological knowledge, knowledge generation and knowledge use

1. Extension works under a harmonious complementation among local governance, government institutions, non-government organizations and people's organizations/community organizations.
2. Extension works with, "not for", the people. Extension facilitates problem analysis, problem solving and decision-making by the farmers.
3. Extension is accountable to its clients, but the clients, too, must bear corresponding responsibilities.
4. The clients are the decision-makers and the implementers of solutions; they must be equally responsible for the success of extension.
5. Effective extension occurs only when the client fully understands the issue and is involved in identification and implementation of agreed solutions/action.
6. Extension is anchored on relevant, practical and doable knowledge or recommendations/solutions, thus the need for continuous linking for knowledge and skills enhancement
7. Local participation by men and women. Extension with farming groups, addressing both practical and strategic gender needs, and using gender-sensitive participatory methods

## The Clients of Extension

8. Local groups participating in extension must have strong institutional/ organizational anchorage.
9. Extension must be local and accessible to facilitate regular contact and decision making at the local level.
10. Extension must bear economically interesting messages, with production and marketing services
11. Extension proceeds with proper infrastructure and mobility support and with responsive and timely capacity building program
12. Extension is long, stepwise process.

### Adult Learners:

- Farmers or the women and men in agriculture and fishery
- Out -of- school youth
- Communities/Organizations

### General conditions of the clients of extension:

1. Resource-poor
2. Most neglected in terms of basic services such extension, health, roads, markets
3. Poor access to information and technology options
4. Inappropriate farming /fishery practices
5. Typically individualistic(not interested to join organizations)
6. Dole-out oriented (due to experiences in past program/project approaches)
7. Rural, remote and exposed to peace and order problems
8. Have varied land tenure/arrangement issues
9. Have varied experiences in projects that have come and gone without sustaining (thus, to some extent, might have been cynical, pessimistic or distrusting).

## Principles of Adult Learning

Knowles (1998) and Brookfield (1986) established that adult learning should be grounded in the learners' experiences, and involve engagement between the trainers and learners.

Relating with adult learner requires understanding of the following principles adapted from Knowles (1998) and Brookfield (1986) :

1. *The need to know* -Adults need to know what and why

- they need to learn before undertaking to learn it. Adults are more afraid to fail and want to make sure the undertaking is worthwhile.
2. *The learners’ self-concept and self-direction* - Adults have a self-concept of being responsible for their own decisions and for their own lives. They resent and resist ideas “imposed” on them.
  3. *The role of the learners’ experiences* - Adults possess varying quantity and quality of experiences. This implies wider divergence and difference, or a high degree of heterogeneity; thus, different biases that may influence their openness to incoming information or ideas, and the rate of adoption of the same.  
  
It is important for the learning facilitator to draw the experiences of the participants when starting a topic or discussion.
  4. *Readiness to learn* - Adults become ready to learn those things they need to know and be able to do in order to cope effectively with their real-life situations.  
  
Adults question the truth or usefulness of the information they receive.
  5. *Orientation to learning* - Adults are life-centered or task-centered in the orientation to learning. Adults learn to assist in performing tasks and dealing with problems.
  6. *Motivation* - Adults are more responsive to internal pressures (e.g. self-esteem, quality of life); then external motivations (better production, higher income). It is necessary for the facilitator to raise their self- confidence,
  7. Participation in learning is voluntary.
  8. Not all learning methods can be equally effective to all adult learners. Facilitators need to be innovative to design appropriate methods and approaches.

**Core Extension Messages**

In its articulation of special concerns, the Agriculture and Fishery Extension (AFE) points out that:  
  
“Appropriate technologies shall be used to protect the environment, reduce production cost, improve product quality and increase value-added for global competitiveness.”  
  
The **core extension messages** in the context of sustainable upland development are **production and conservation** through appropriate land management and farming system-- slope treatment oriented practices or STOP, soil and water conservation or SWC, and trees- and fruit trees- based diversified farming system or DFS.

**Extension Methods**

1. **Individual method:** Personal and face-to-face but with individual client only.

Advantages:

- ☺ Better AT-farmer familiarity and rapport
- ☺ First hand information on farmer and farm situation
- ☺ Immediate feedback
- ☺ More need-focused
- ☺ Interactive
- ☺ Most effective to teach skills

Disadvantages:

- ☹ Time consuming
- ☹ More expensive
- ☹ Narrow reach/ less efficient

2. **Group methods:** Face- to- face but with a group, like in: on-site, hands-on demonstration and return demo, field day , result demonstration, field trips/ cross visits, Farmers Field School, meeting/group discussion

Advantages:

- ☺ Immediate feedback
- ☺ Time efficient
- ☺ Reach more people at a time and space
- ☺ Can be interactive and participatory
- ☺ Promotes discipline, conformity to norms

Limitations:

- ☹ Needs good facilitation skills
- ☹ Deals with cultural differences/diversity
- ☹ Consensus takes more time
- ☹ Competition may arise

**3. Mass method:** Mass media - print, broadcast and film

Advantages:

- ☺ Wide reach: reach more people at a time and transcend space
- ☺ Can be facilitated to become interactive (live broadcast with callers/walk -in; school- on -the air with enrollees and the like).

Limitations:

- ☹ Can be very expensive
- ☹ Needs more specialized skills
- ☹ Needs hardware/software that cannot be easily acquired or used when electricity is a limitation
- ☹ Lacks experiential element
- ☹ Evaluation of learning cannot be immediate
- ☹ Feedback is not immediate
- ☹ Can be too broad to cater to specific need; hit or miss target audience
- ☹ More difficult to monitor reach and evaluate impact especially in open broadcast or readership

**4. E- extension:** computer mediated communication (CMC) and information and communication technology (ICT)

This is web-based extension methodology being explored and used to serve the information and technology needs and updating of MAs, ATs, trainers, facilitators and a number of progressive farmers, fisherfolks and organizations.

Philippine Experiences:

PCARRD: Knowledge Networking towards Enterprising Agricultural Communities (K-AGRINET)

DOST-PCARRD: e-Consortia and e-Farm;

PhilRice: Open Academy for Philippine Agriculture

DLR and DAP: e-AGRIkultura.

Advantages:

- ☺ Very fast retrieval of information
- ☺ Practical for LGUs with access to internet
- ☺ Time efficient
- ☺ ATs/extension workers can be updated without necessarily leaving from work.
- ☺ Interactive; feedback can be immediate
- ☺ Centers/satellite in the different regions can facilitate access

Limitations:

- ☹ Expensive for individuals
- ☹ Applicable only to those with access to internet
- ☹ Dependent on efficiency of server or internet connection
- ☹ Needs computer skills from users
- ☹ Needs highly skilled and knowledgeable software developer

## Extension Approach

Agricultural extension in the Philippines has evolved from technology transfer and technician-centered approaches to one that is participatory, client-centered and empowering.

### 1. Transfer of Technology (ToT) approach

#### 1.1 MAO-LGU - led : Agricultural Technologist (AT)

By official mandate, Municipal Agriculturist (MA/MAO), through the Agricultural Technologists (ATs), leads the implementation of agricultural extension and production programs of the local government unit (LGU).

Advantages of ToT :

- ☺ Faster adoption of technology
- ☺ Faster implementation of government programs

Limitations of ToT:

- ☹ Project pre-determined by region/national DA
- ☹ More dole outs
- ☹ Farmers are beneficiaries
- ☹ Not sustainable/ "projectized"
- ☹ Evaluation is usually quantitative



- ☹ Human Resource Constraints, such as:
  - Unmanageably big area coverage for each AT.
  - In reality, an AT serves as many as 5 barangays. This makes extension delivery very slow and inadequate.
  - Most ATs do not usually stay/live in their service barangays
  - AT turn-over due to status of appointment, change in leadership (LGU)
  - Priority for national/regional programs carves significant portion of AT's time for priority local extension needs.
  - LGU budgetary constraints

## 1.2 Barangay-led: Barangay Extension Worker (BEW/)

To provide communities more access to extension services, more than 130 barangays of some 31 municipalities in the provinces of Davao Oriental, Compostela Valley, Davao del Sur, Sarangani and South Cotabato have adopted a barangay-led extension approach to technology dissemination by creating a Barangay Extension Worker or BEW post.

- ☞ BEW is an experienced farmer and adopter of good farming practices and has undergone a series of knowledge and skills enhancement exposures.
- ☞ Originating from upland context, the main task of the BEW is to speed up adoption of soil and water conservation and the diversified farming system among upland farmers through localized access to extension services.
- ☞ An earlier version of the BEW is the AMBET or Agrikulturang Makamasa Barangay Extension Technician, an innovation of (*and confined to*) the Province of Davao Oriental under the Agrikulturang Makamasa program of the Department of Agriculture.

## 2. Participatory Approach

Farmers identify their extension needs and take active part in the delivery of responsive extension services. Other government and non-government organizations take part in extension delivery.

From “transfer of technology” model, extension shifts to be need and culture responsive, and is carried out in partnership among farmer groups/ organizations, government and private sector for service delivery.

### 2.1 Farmer-Based Extension (FBE)/Farmer-Led Extension (FLE)

- ☞ Farmer-Led Extension (concepts and practices) draws on the experience of farmers, community workers, non-government organizations, researchers and policy makers in several countries.
- ☞ Focuses on challenges to agricultural extension; extension experiences, origins and examples of farmer-to-farmer extension in Latin America, Indonesia, India, Philippines and Vietnam; principles and methods in farmer-to-farmer extension
- ☞ Considers the range of knowledge, experiences and capabilities of farmers to manage their own production systems, participate in agricultural knowledge seeking, knowledge sharing, and decision-making.
- ☞ Small groups of farmers at the village disseminating information to fellow farmers;

- ☞ Use of traditional cooperation mechanism like “bayanihan”, “alayan” or “dagyaw” in demonstrating technologies in the farms of interested adopters; involves farmers in knowledge development through the conduct of on-farm experimentation; undergo capacity building. Groups usually belong to Farmer-Led Organizations (FLO).
- ☞ Largely group methods and facilitation is highly important in this approach.

#### Variations of FLE:

##### ***a. Farmers First and Last (FFL)***

- A form of farmer-based extension
- FFL considers the farm families as the key actors and participants in the development process, and as such, extension must take their priority needs, conditions and circumstances as points of reference.
- FFL recognizes the farmers’ potentials and ability to develop and disseminate agricultural technologies.

##### ***b. Farmer-to-Farmer Extension***

- **Landcare approach:** Landcare is a farmer-to- farmer approach to rapid and inexpensive dissemination of land and natural resource management technologies. Functionally competent Farmers Training Groups (FTG), Bantay-Wahig (water watch group), and Farmers Research Committees (FRC) are constituted to facilitate on site, hands-on knowledge development and knowledge sharing activities among farming communities.

Key Issues: Resource base issues and problems, largely upland-related and oriented toward upland development, with bias on SWC and Agroforestry Systems

Key Partners/Triangulation: Technical Facilitators, Landcare Groups, Local Government Unit

Key Actors at the Grounds: Facilitators, Farmers Training Groups and Farmers Research Committees

The Landcare experience in the Philippines, through the World Agroforestry Centre (ICRAF), inspired the inclusion of farmer-trainers or Farmers Training Groups in the Community-based Extension Delivery Scheme of UDP.

#### • **Farmer promoters**

Latin American experience where **Farmer Promoters** carry out farmer-to-farmer extension in the areas of agriculture, micro-enterprise, health and nutrition, housing, literacy, community organization, credit management and family planning.

Farmer promoters come from the grassroots; usually have little or no education but have undergone capacity building; volunteer, part time or full time; supported by NGOs, GOs, or community organizations/farmers associations.

## **2.2 Community-Based Extension Delivery Scheme**

- ☞ Upland Development Programme (UDP)- tested participatory approach to extension
- ☞ This is a deliberate convergence of different “extensionists” from the municipal to the sitio levels, namely: AT, BEW and FTGs who constitute the Community-Based Extension Team or CBET

☞ Responsibility and commitment to extension is shared by MLGU, BLGU and Community (community organization).

☞ A larger Extension Network provides support to CBET.

☞ The organizational anchorage of each of the members of the CBET is as follows:

- AT - MLGU
- BEW - Barangay
- FTG- Upland Barangay Associations (UBA or any appropriate, existing organization)

initially adopted by the 36 municipalities of the provinces of Davao Oriental, Davao del Norte, Compostela Valley, Davao del Sur, Sarangani and South Cotabato, through resolutions passed by the Associations of Barangay Captains (ABC) of each municipality.

☞ Applies participatory, experiential and dynamic group methods like demonstration, hands-on, group meetings/small group discussions, study trips/field visits, farm planning, farmer-to - farmer training and farmers field school (FFS)

**Qualities of a Good Extension Worker**

- A. The Professional (AT)
  - Has appropriate academic preparation/degree
  - Deep understanding of issues in sustainable development, especially those that directly relate to land and natural resource management
  - Has good facilitating skills
  - Team player
  - Ability to link or build partnerships
  - Has respecting and trusting leadership quality
  - Interested in community/rural work and the uplift of disadvantaged farmers and fisherfolks
  - Committed to continuing education and update of knowledge
  - Local/resident in the municipality/ barangay or area of assignment

- Preferably adopter/model/user of good practices
- Credible
- Long-term/permanently placed

- B. Farmer-Extension Worker (BEW and FTG)
  - A farmer
  - Experienced and adopter of appropriate farming technologies
  - Respected in the community and the local governance
  - Interested in people and their well being
  - Committed to voluntary extension work
  - Has respecting and trusting leadership quality
  - Accessible and approachable
  - Has good facilitating/communication skills
  - Willing to make his/her farm an actual extension tool for experiential learning
  - A team worker willing to learn and work with the AT/professionals and other key players
  - Resourceful and open to continuing education
  - Family /household is supportive of voluntary extension work

**Session and Activity Guide**

**EXTENSION PRINCIPLES AND METHODS**

**I. Introduction to the Session**  
**II. Session Proper**

Duration: 25 minutes

**Objectives:**

1. As icebreaker to the session
2. To get and assess participants’ understanding of extension concept, principles, methods and approaches

**Materials:** Case studies with guide questions and/or Discussion points; or separate lists of concepts, principles, methods and approaches.

Manila paper and /or meta cards, marking pens, and masking tape or adhesives

**Procedure:**

**A. SMALL GROUPS DISCUSSION**

**Option 1**

- 1) Break the participants into 6 small groups of 4 - 5 members. Number and size of groups may be adjusted, depending on prevailing training environment or conditions.

***NOTE:** Participants can be pre-grouped upon registration to save time. They can be assigned specific name tag colors or number. Another grouping option is to base distribution according to profile accomplished before the training*

- 2) Assign each group to the following topics:

**Group 1 Topic 1**      Meaning and Purpose of Extension

*Facilitate the group’s discussion and coming out with practical definitions of Extension, and articulation of its purpose/s. Provide guide questions for a more focused discussion.*

**Group 2 Topic 2**      Principles of Extension

*Facilitate the group’s discussion and articulation of Extension Principles. Provide guide questions for a more focused discussion.*

**Group 3 Topic 3**      Clients of Extension and the Principles of Adult Learning

*Facilitate the group’s discussion and identification and description of the intended “clients” of extension. Provide guide questions for a more focused discussion.*

**Group 4 Topic 4**      Methods of Extension

*Facilitate the group’s discussion and description of the different methods of extension, including their advantages and limitations. Provide guide questions for a more focused discussion.*

**Group 5 Topic 5**      Approaches in Extension

*Facilitate the group’s discussion and description of the different approaches to extension, from Transfer of Technology model to participatory and farmer-driven extension; including advantages and limitations of each approach. Provide guide questions for a more focused discussion.*

**Group 6 Topic 6**      Qualities of a Good Extension Worker  
a) the professional (AT)  
b) the farmer-extension worker (BEW/FTG/and similar volunteers)

*Facilitate the group’s discussion and description of the qualities of a good extension worker, professional or farmer-volunteers. Provide guide questions for a more focused discussion.*

- 3) Give them 20 minutes for the discussion.

**Option 2**

The trainer may modify the task. He/she may give a list of concepts, principles and others, which correspond to the ideas asked from each of the group in Option 1. This strategy is more effective when dealing with participants with varied academic background. This will ensure easier understanding and clustering of ideas by the participants. Extent or depth of learning is also increased.

**B. PRESENTATION**

1. Call the participants to a plenary.
2. Ask each group to present the outputs. Give each presenter 10 minutes (5 minutes presentation and 5 minutes interaction).



C. PROCESS AND INPUT BY RESOURCE PERSON 45 minutes

Reinforce good ideas. Correct myths, invalid assumptions, or overstatements, but make sure the participants understand why these are so.

Tackle the items or “messages” that have not been covered by the small groups discussions and presentations.

IV. **Summary/End of Session**

V. **Evaluation**

*Prepared by: Dinah Q. Tabbada and Alexander U. Tabbada. With inputs from ATI and USEP*

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MODULE 1

AGRICULTURAL EXTENSION

Session 2

Community- Based Extension Delivery Scheme

Objectives	<p>At the end of the session, the participants should be able to:</p> <ol style="list-style-type: none"><li>1. Expound on the role of extension in sustainable upland development;</li><li>2. Describe the features of a community-based extension delivery scheme;</li><li>3. Describe the roles and functions of the actors in the community-based extension strategy; and</li><li>4. (For Municipal/ City Agriculturists) Make a plan for a community-based extension delivery scheme for particular barangay (replication/one that has not organized a community-based team yet).</li></ol>
Suggested Methods	<p>Film showing, site visit, interview/interaction with Community-Based Extension Teams, experiential vehicle, testimonies, workshop, group discussion</p>
Learning Materials	<p>Overhead projector and transparencies, blackboard/whiteboard, chalk/whiteboard pen, manila paper, meta cards, marking pens, Sustainable Upland Development (SUD) model, film/CD</p>
Time Allotment	<p>3.0 hours</p>

Contents:

- A. Review of the SUD Model and the Development of Community-Based Extension Delivery
- B. Characteristics of Effective Delivery Extension System
- C. The Community-Based Extension Delivery Scheme
- D. The Community-Based Extension Team: members, roles and functions
- E. The Institutions/ Extension Networks and the Key Players in the Extension Delivery System: roles and functions
- F. Organizing for community-based extension delivery

**IMPORTANT:**

***The Resource Person further discusses the topics to emphasize or include what have been left out in the discussions based on the following details of session contents:***

<u>TOPIC</u>	<u>MESSAGES</u>
Characteristics of Effective Delivery Extension Scheme	<ul style="list-style-type: none"><li>• Participatory</li><li>• Has efficient area coverage and work program</li><li>• Local/accessible/hands-on</li><li>• Has appropriate technical and organizational competencies or capacities to access, link, use and manage available extension resources (like the already established Regional extension networks in Region XI and XII</li><li>• Can readily hold learning activities within the village (through the Learning Site)</li><li>• Has sustaining networks and partnership</li><li>• Has institutional support</li><li>• Is formally integrated/mainstreamed with government institutions and programs</li><li>• Backed up with policies and ordinances, orders, declarations or formal agreements</li></ul>

**The Community-Based Extension Delivery Scheme**

Development:

- Developed and tested from experiences of the Upland Development Programme in Southern Mindanao (UDP).
- Has evolved following a progressive pattern, the extension scheme started with the ATs, then para-technicians who formally became the Barangay Extension Workers (BEW), then the Farmers Training Group (FTG) that cover the barangay but membership and tasks are equally distributed among the sitios.

Features:

1. Combines the strengths of government-led, and farmer-led extension approaches
2. Group, hands-on and participatory processes
3. More focused in terms of issues and area coverage
4. With institutional anchorage
5. Policy support for sustainability
6. Established and functional networks

**The Institutions/ Extension Networks and the Key Players in the Extension Delivery System: roles and functions**

**1. Municipal Local Government Unit:**

Local Chief Executive/ Mayor

The Mayor appoints and deploys to a particular barangay an Agricultural Technologist who reports directly to the Municipal Agricultural Officer/ Municipal Agriculturist.

Municipal Agricultural Officer/ Municipal Agriculturist (MAO/MA)

Under the direct supervision of the Mayor, the MAO/ MA shall:

- Ensure inclusion of community-based extension delivery in the Annual Investment Plan (AIP)
- Plan and implement agricultural projects including soil and environmental conservation.
- Facilitate assignment of full-time and regular/ permanent AT in the barangay
- Supervise the ATs assigned in the uplands, lowlands and coastal areas

- Provide technical and moral support to project implementation
  - Identify training needs of ATs and request PLGU and DA - RFU to provide such training
  - Provide incentives to extension personnel
- 2. Barangay LGU**
- Punong Barangay and the Council**
- Appoint a BEW with the approval of the members of the council,
  - Provide appropriate policy and program support to extension and adoption of technology/ practice
  - Allocate fund support for extension at the local level
  - Assist in monitoring and evaluation of extension
  - Facilitate requests (through resolution) for support from the extension network from the municipal, provincial and regional level.
  - Work for the inclusion of SUD and community-based extension support in the Municipal Extension Plan or MEP.
- 3. Partner/Support Institutions/Network**
- In line with their vision, mission and goals, each member institutions can extend support to extension - training, technical inputs, organizational development, facilitation, information, education and communication (IEC). These institutions are:
- Regional/national government agencies: DA, ATI, SUCs, RAFCIs, others
  - Non-Government Organizations
- 4. The Community-Based Extension Team:**
- Agricultural Technologists (ATs)
  - Barangay Extension Worker (BEW)
  - Farmers Training Group (FTG)

The Municipal Agriculturist or MA (in some cases, Municipal Agricultural Officer or MAO), being the supervisor of the AT, serves as the “link” between the RRDEN and the CBET. Thus, it can be said that the regional and community extension tandem is as strong as the MA.

**Role of Agricultural Technologists or Agriculturists**

1. Lead the Community-Based Extension Team
2. Implement cooperative extension service mechanism with the BEW and FTG with the support of BLGU, barangay organizations, and the community.
3. Access barangay and household and farm profiles for data base in aid of extension planning
4. Facilitate in farm planning and adoption of systems responsive of the LUB-BDP
5. Facilitate the appointment of BEW and the organization of FTG
6. Conducts periodic training for BEWs and FTGs
7. Provide coaching on agri-business, postharvest, marketing and savings mobilization to the BEWs, FTGs, and Farmers Associations
8. Facilitate farm classes/farmers field schools with farmers, women, out of school youths
9. Facilitate conduct of field demonstrations
10. Facilitate consultations at farmer's field
11. Facilitate organization/ or enhancement of existing community organizations
12. Facilitate farmers' access of support and services of various institutions, especially those within the RRDEN
13. Assist farmers in the preparation of proposals or application for assistance and marketing documents
14. Assist farmers in securing tenurial instruments
15. Liaison work for linkages with processors and institutional buyers of products
16. Act as liaison to the LGU offices, through the MAO/ MA.



### Role of the Barangay Extension Workers (BEWs)

1. In cooperation with FTG, assist farmers in putting up of recommended farming system-DFS, multi-storey, and the like.
2. Assist farmers on the layout of contour lines and establishment of hedgerows (if farm is sloping)
3. Attend farmers consultation on urgent farm problems
4. Update Sanguniang Barangay about extension activities through periodic reports and meetings
5. Report to barangay when needed

### Selection of BEW

BEWs are barangay appointed paratechnician. Many of the BEWs receive modest honorarium from the barangay or the MLGU.

#### Basic Qualifications

Selection of potential BEW, may be based on the following basic qualifications:

1. Respected in the community
2. Adopter of quality DFS and appropriate soil and water conservation/land management practices.
3. Has undergone basic training on upland agriculture or natural resource management
4. Has good communication skills
5. Demonstrated leadership
6. Willing and confident to share knowledge, technologies, experiences and skills with other farmers
7. Willing to learn new technologies and approaches
8. Willing to work on voluntary basis and with a team

The criteria to be used in selecting BEW may be agreed upon by the Sanguniang Barangay, in consultation with the AT, members of the community and relevant groups.

### Role of Farmers Training Group (FTG)

An FTG may be composed of 4-5 members, each representing a sitio or village within the barangay. Together with the AT and BEW and with the support of the UBA/or farmers organization, the FTG shall:

1. Manage a Learning Site as local field school where farmers learn good practices through participatory, hands-on methodologies.
2. Conduct information, education, and communication campaign at the sitio or barangay
3. Facilitate the adoption of sustainable upland farming practices and natural resource management strategies
4. Access external support to local extension initiatives and technology adoption

#### Roles of Each Member of FTG

A capacitated FTG member is expected to:

1. Assist fellow farmers in the sitio in preparing farm plan following the Slope Treatment Oriented Practices (STOP) approach.
2. Recommend qualified farmers for production or any other form of assistance.
3. Coach fellow farmers who are interested to adopt diversified farming and soil and water conservation.
4. Assist the BEW and AT in conducting hands-on training for groups of farmers or other interested groups.
5. Share own experiences, knowledge and observations with other farmers, including cross-visitors.
6. Develop own farm as model for sustainable upland farming and as satellite Learning Site where farmers from the sitio and from other places can learn appropriate technologies and practices.

<b>Selection of FTG Members</b>	<p>FTG members are selected using a set of criteria and a process. The criteria and process may be situation-specific and agreed upon by stakeholders.</p> <p><b><u>Basic Qualifications</u></b></p> <p>Selection of a potential FTG member, may be based on the following basic qualifications:</p> <ol style="list-style-type: none"><li>1. Member of a community organization like the UCO, farmers cooperative, others</li><li>2. Respected in the sitio</li><li>3. Willing to serve as volunteer</li><li>4. Adopter of quality DFS and appropriate soil and water conservation</li><li>5. Has good communication skills</li><li>6. Willing and confident to share knowledge, technologies and skills with other farmers</li><li>7. Willing to learn new technologies and approaches</li><li>8. A team player</li><li>9. Has undergone basic training on upland agriculture or natural resource management.</li><li>10. Family or household supportive of his/her voluntary tasks.</li></ol> <p>The criteria to be used in selecting members may be agreed upon by the selection team which may be composed of representatives of UBA, BLGU, MLGU and other partners.</p> <p><b><u>Suggested Selection Process</u></b></p> <p>The selection of FTG members may follow the following process:</p> <ol style="list-style-type: none"><li>1. UCO nominates two candidates from the sitio using the basic qualification criteria</li><li>2. UBA, AT and partner (such as ICRAF) select the member from the two nominees by way of interview</li><li>3. UBA presents the selected member to the members the Barangay Assembly</li><li>4. Sanguniang Barangay formally recognizes new FTG member by way of a resolution</li></ol>
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<b>The Learning Site (LS)</b>	<p><b><u>Purpose of LS</u></b></p> <p>The LS is the official site where the AT, BEW and FTGs learn and demonstrate recommended farming practices. It is the local farmers field school for recommended technologies and extension messages.</p> <p>Interested farmers may enroll at the LS, apply technologies on his/her farm and graduate to become Model Farmers.</p> <p><b><u>Model Farmers</u></b></p> <p>Model Farmers (MF) are “graduates” of the Learning Sites run and managed by the Farmers Training Groups, ATs and BEWs.</p> <ol style="list-style-type: none"><li>1. MF adopts good farming practices, especially diversified farming system and land management.</li><li>2. MF may volunteer to become an FTG member or as host of on-site demonstration or cross visits</li></ol>
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**Upland Barangay Association (UBA) or Similar Farmers Organization**

The UBA is a barangay based organization of upland farmers. It is the institutional anchorage of the FTG. Similar organizations can equally provide institutional homes to FTGs. The UBA (or similar farmers groups) is committed to:

1. Help select FTG members based on agreed criteria.
2. Provide organizational anchorage to FTG, including support to capacity building
3. Work with BLGU in the formulation of policy for development and sustainability of extension delivery system
4. Coordinate or work closely with the AT, BLGU, BEW and FTG for the synchronized delivery of extension messages
5. Promote production with soil conservation, agribusiness, farm records keeping, proper use and prompt repayment of production loan, simple economic analysis, and savings and profit recycling, through its Agri-business Committee.
6. Help establish market linkages and compiles listings of product processors
7. Enhance effectiveness of bagsakan centers (if any)
8. Promote group acquisition of inputs and marketing of products
9. Help the AT, BEW, FTG in monitoring and evaluation of extension

**Communities/ Farmers**

The community, farmers and rural households comprise the clientele and participants of agricultural extension.

**Session and Activity Guide**

**COMMUNITY-BASED EXTENSION DELIVERY SCHEME**

**I. Introduction to the Session**

**II. Session Proper**

**A. INPUTS ON THE COMMUNITY-BASED EXTENSION DELIVERY SYSTEM**

Duration: 30 minutes

1. The session starts with the presentation or review of the Sustainable Upland Development or SUD Model
2. The Resource Person introduces the community-based extension delivery scheme responsive of the SUD

**B. ACTIVITY (IF TIME IS LIMITED, CHOOSE BETWEEN ACTIVITY 1 AND ACTIVITY 2; OTHERWISE, GO THROUGH BOTH ACTIVITIES).**

**If using Activity 1**

Activity 1 may be used when you are sure the Community-Based Extension Team is available for interview. This means that the Resource Person must decide which activity he/she will use so that BEW and FTGs can be invited promptly.

**Activity 1 Interaction/interview with the Community-Based Extension Team and community leaders in the Learning Site (AT, BEW, FTG, UBA and BLGU).** There shall be 1 AT, 1 BEW, 1 FTG (of 4-6 members), 1 UBA representative, and 1 BLGU representative

Duration: 60 minutes

**A. INTERVIEW/INTERACTION (20 minutes)**

1. Divide the participants into groups of 5 - 8 members each.
2. Ask each group to select a leader and a documenter or secretary. **OR** Assign each group at least one facilitator/Resource Person.
3. Assign each group to the following:  
Group 1 AT (1)  
Group 2 BEW (1)  
Group 3 FTG (1 group of 4-6 members)  
Group 4 UBA (1) and BLGU (1)
4. Provide each group an interview guide. Give emphasis on the processes, roles and motivation to participate.
5. Allow the groups to go where they feel they could interview/interact better (but not too far for facilitation and for easier assembly with others at the end of allotted time.

B. SHARING OF RESULTS (30 minutes)

Ask each group to share present their results (7 minutes each).

C. PROCESSING AND INPUT (60 minutes)

Resource Person presents the Community-Based Extension Team.

If using Activity 2

Activity 2 Analysis of roles and tasks of the members of the community extension team: AT, BEW, and FTGs

Duration: 40 minutes

Objectives:

1. For the participants (ATs) examine/analyze their role and the roles of other members of the Community-Based Extension Team, like the BEW and FTG.
2. For the ATs to affirm/validate their roles and tasks and identify circle of support

A. GROUP DISCUSSION: Discussion and analysis (30 minutes)

Option 1

1. Refer to the same groups in the first activity.
2. Give each group a set of writing and presentation materials, handout and discussion guide
3. Instruct each group to discuss and agree on the following:

- a. **What kind of extension service delivery must the province and municipal LGUs adopt to implement the SUD model?**

*Facilitate the group's description of an extension delivery system that the local government units must jointly establish and support (provincial, municipal, barangay).*

*The group may start with assumptions on the gravity or extent of the problems in upland agriculture and land degradation in a particular province/municipalities.*

- b. **Who should be involved in extension service delivery? What are the roles of each?**

*Facilitate the group's identification of primary or key actors/players in the above extension delivery scheme. For each key actor or player (individual, group, agency), ask the group to describe/assign roles/tasks and responsibilities.*

- c. **What support will this extension service delivery need? From whom or from what institutions? How will support be accessed?**

*Facilitate the group's identification of needed support. For example: support for capacity building/training, cross visits, community organizing, IEC, policy, ordinances, others.*

- d. **What are the perceived problems in operationalizing the community-based extension system in the context of the SUD?**

*Facilitate the group's identification of challenges and problems ahead. For example: commitment of key players, barriers to volunteerism, budget, priorities, policy, ordinances,*

Option 2

Use same groupings as in Option 1. Ask each group to undergo/do the following:

1. Tell the groups to write on metacards specific problems they encounter in the implementation or delivery of extension programs or services. Give them 15 minutes to do this.
2. At the end of 15 minutes, ask the groups to cluster the problems according to command responsibility, for instance: Mayor/MA, ATs themselves, Human Resource/Workload, BLGU, Community, Policy, and the like. Give them 10 minutes to do this.
3. Ask the groups to analyze the above problems and clustering, and then to answer the questions below. Give them 20 minutes to do this.
  - a) Who should be involved in extension delivery, from planning, funding, implementation, evaluation and sustenance?
  - b) What should be the role of each?
  - c) What support can they specifically give/contribute?
  - d) How will these key players coordinate/converge? How will their contributions/support be accessed towards extension goals?

B. PLENARY: Presentation of outputs

1. Give each group 10 minutes to present the output
2. Processing by Resource Person.

C. INPUT: by Resource Person



**SUGGESTED OPTIONS IF PARTICIPANTS ARE PROVINCIAL, MUNICIPAL OR CITY AGRICULTURISTS:**

A. FILM SHOWING: UDP Briefer and similar documentation

Objective: For the participants to take the first step to the realities in or the state of the farms, the farmers, and the environment.

Tools: UDP briefer/documentary

B. PRESENTATION OF THE SUD MODEL

Objective: For the participants to appreciate the relationship among the schemes

Tools: The SUD Model CD or Presentation

C. CROSS VISIT AND INTERVIEW - nearest barangay with a Learning Site, FTG and BEW (include testimonies from LGU, BEW, others)

D. REFLECTION-DECISION TO ADOPT THE MODEL

**WORKSHOP that must follow:**

*Objective: For MAs to operationalize adoption of community-based extension delivery scheme*

*Tools: Handout on SUD, Community-based Extension Delivery Scheme (CBEDS) and Community-Based Extension Team (CBET)*

A. How to establish the Network

1. *Preparing the Regional Network for CBEDS with DA, ATI, SUC and other relevant government units/agencies in the province, municipality and barangay.*
2. *Framing the Structure, roles and functions: adoption, validation, confirmation vis-à-vis specific LGU conditions*
3. *Signing of MOA*

B. Planning for Capability Building on extension, community organizing / organizational development, and facilitation and land management.

C. Planning for Capacity Improvement for rural infrastructure, Barangay Development Plan/Land Use Plan, Village Enterprise

D. Prentation and critique of output

E. Input by Resource Person

**III. Summary/End of Session**

**IV. Evaluation**

***Prepared by: Dinah Q. Tabbada and Alexander U. Tabbada, With inputs from ATI and USEP***

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# MODULE 4

## LAND MANAGEMENT

### Purpose of the Module

This module intends to enhance and/or refresh the knowledge of participants on appropriate land management practices for sustainable farming in the uplands where soil erosion is a major problem. It emphasizes the significance of conservation farming and presents soil and water conservation options for smallholders. Further, it introduces Slope Treatment Oriented Practices (STOP) as a guide in planning for sustainable diversified farming systems.

In short, this module presents strategies and technologies for balanced production and conservation for sustainability.

### Sessions

This module is made up of THREE sessions, namely:

- 1 Soil and Water Conservation
- 2 Slope Treatment Oriented Practices
- 3 Diversified Farming System

MODULE 4 LAND MANAGEMENT

Session 1 Soil and Water Conservation in the Uplands

Session Objectives	<p>At the end of the session, the participants should be able to:</p> <ol style="list-style-type: none"><li>1. Articulate and explain the role of soil and water in upland agriculture and their effects on the lowlands;</li><li>2. Discuss the problem and the factors affecting soil erosion and degradation in the uplands;</li><li>3. Discuss the different practices of soil and water conservation, including their advantages and limitations;</li><li>4. Determine the appropriate soil and water conservation options for specific needs or problems; and</li><li>5. Demonstrate different soil and water conservation methods and practices.</li></ol>
Suggested Methods	<p>Site visit, workshop, sharing of experiences, discussion, lecture, inventory and assessment of existing SWC practices, and practicum/ demonstration</p>
Learning Materials	<p>Transparencies or PowerPoint presentations, overhead or multi-media projector, flipcharts, photographs, realia/object media, papers, pencils, cartolina or Manila paper, crayons, A-frame, slope indicator, stakes (madre de cacao branches or bamboo), bolo, evaluation form/tool or rating sheet for the demonstration, and handout.</p>

Evaluation Methods	Graded fieldwork/demonstration
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Time Allotment	5.0 hours
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Contents:	
A.	The Role of Soil and Water in Upland Agriculture
B.	Soil Erosion and the Factors Affecting It
C.	Principles and Strategies of Soil Conservation
D.	Soil and Water Conservation Options for Upland Farmers

**IMPORTANT:**

**The Resource Person further discusses the topics to emphasize or include what have been left out in the discussions based on the following details of session contents:**

<u>TOPIC</u>	<u>CORE MESSAGES</u>
Role of soil and water in upland agriculture	<ol style="list-style-type: none"><li>1. Soil and water are the primary resources in agriculture. Both are vital resource for plant growth.</li><li>2. Water constitutes 80 to 90 % of agriculture as it is needed by crops and animals for growth and development. When water is limited, agricultural production is also limited.</li></ol>

3. Nutrients, whether applied or naturally occurring, are mostly found in the topsoil. Soil organisms that are beneficial to plants are also found in the soil.
4. When not properly managed, water can become a threat to the soil.
5. When the top soil is washed away by run-off, the nutrients are also removed, thus, depriving the plants of the needed elements.
6. Eroded soils settle on river beds, lakes, irrigation canals or on low-lying fields, usually in the lowlands

## Soil erosion

Soil erosion is the detachment of soil by rainfall or other agents such as wind and gravity.

What is removed during erosion is the topsoil, the most fertile part of the soil profile.

Large amounts of soil humus and available nutrients are lost resulting to loss of soil fertility.

Loss of soil fertility as a result of erosion has been identified as the major cause of poverty in the uplands.

## Factors affecting soil erosion

- |                                       |   |
|---------------------------------------|---|
| <b>Factors affecting soil erosion</b> | <ol style="list-style-type: none"> <li>1. Rainfall</li> <li>2. Slope</li> <li>3. Soil erodibility/soil type</li> <li>4. Vegetation</li> <li>5. Farming practices</li> </ol> |
|---------------------------------------|---|

## Soil and water conservation: principles and strategies

Erosion can be controlled by (a) **protecting the soil**, (b) **reducing soil susceptibility** or (c) **combining protection and reducing susceptibility**.

- strategies**
1. The soil can be protected by canopy or groundcover provided by trees and crops.

2. Reducing the length and steepness of slope reduces velocity of runoff, thus, protecting the soil also.
3. Improved soil management such as incorporating crop residues, animal manure and other forms of organic fertilizers improves soil structure, thus, increasing water holding capacity.
4. Minimizing tillage or cultivation and proper cropping sequence and arrangement protects the soil and reduces vulnerability to erosion.

## Soil and water conservation practices: options for upland farmers

### A. Agronomic practices

**Diversified or integrated farming** - different components in appropriate parcels or parts of the farm such that cultivation in steep slopes is minimized while providing barriers to erosion in gentle slopes. A diversified or integrated farm in the uplands demonstrates the balancing of production and conservation.

**Multiple cropping** - cultivation of two or more crops on the same piece of land to increase farm productivity, diversity and soil stability.

- a) **Intercropping** - growing two or more crops simultaneously in the same field with the period of overlap being long enough to include the vegetative stage.
- b) **Relay cropping** - planting of two or more annual crops simultaneously such that the second crop is planted between the rows of a standing crop with minimum soil disturbance after the latter has flowered or nearing its harvest.

**Agroforestry** - planting of trees on farm to increase farm productivity and profitability while protecting sloping lands and regenerating degraded soils. The adaptability to specific agro-climatic conditions, the relationships with other farm components and the ability to respond to the needs of the farm household and its farm should be considered in selecting tree species to use for agroforestry.



**Alley or strip cropping** - growing crops in alleys or strips between leguminous hedgerows or other barriers along contour lines. With alley cropping, soil erosion is minimized as sediments are trapped at the base of the hedgerows or other barriers that also reduce surface runoff velocity. The barriers help in the eventual formation of bench terraces over time.

**Minimum tillage** - growing of crops with minimum soil cultivation and disturbance. It protects the soil and reduces the incidence of soil erosion.

**Cover cropping** - planting of leguminous cover crops such as forage peanut and kudzu to protect the soil from erosion, help conserve soil moisture and provide nitrogen.

**Mulching** - utilizing materials from the farm such as dried leaves that can be used to cover the soil for erosion control, weed control and moisture conservation, and eventually as organic matter for soil improvement and plant growth.

**Contour farming** - cultivation and planting along the contour. Using devices such as the A-frame, contour lines are established and used as guides in tillage and planting operations.

**Application of organic matter** - increasing the organic matter content improves soil structure thus enhancing the water holding capacity of the soil.

#### **B. Vegetative barriers**

**Contour hedgerows** - shrubs are planted along the contour line to serve as barriers to soil erosion.

**Natural Vegetative Strip (NVS)** - simply leaving a half-meter grass strip along the contour during land preparation. The strips are maintained by trimming the grasses before every cropping season. Grass cover of the sides (especially the embankment) should be maintained as protection for the NVS from collapsing.

#### **C. Non-vegetative/Physical barriers**

**Bench terrace** - construction of benches along the contour (or across the slope) using the "cut and fill" method to slow down the flow of runoff water.

**Rock wall** - piling of rocks following the contour line in order to establish a physical barrier to soil erosion.

**Pole barrier** - construction of fence-like structure along the contour using ipil-ipil or other locally available poles. The poles can be reinforced with twigs, branches and other farm materials.

**Trash bund** - piling of farm trash such as stems, branches and twigs of trees and shrubs; banana stems and coconut husks along the contour line to help minimize erosion.

#### **D. Drainage and diversion structures**

**Contour ditch/drainage canal** - following the contour line, construct ditches to serve as drainage for water and minimize erosion losses. It is better to start constructing ditches at the upper portion of the slope. The distance between ditches depends on the slope. This may follow the hedgerows or vegetative strips. As a general rule, the steeper the slope, the closer the ditches.

#### **Making the right choice**

There is no limit as to what and how many methods should a farmer use. The choice depends on sound farm plan, crop match, practicability and appropriateness of one or combination of methods, with the farmer's decision and choices anchored on full understanding and appreciation of soil and water conservation.

**Session and Activity Guide**

**SOIL AND WATER CONSERVATION IN THE UPLANDS**

**I. Introduction to the Session**

**II. Session Proper**

**Activity 1                      Site Visit**

Duration: 1 hour

**Objectives:**

1. Give participants first hand exposure to upland farming environment
2. Bring the session in the context of land management and sustainable agriculture.

**Materials:** Manila paper, cartolina/meta cards, marking pens, and masking tape or adhesives

**Procedure:**

**A. FIELD OBSERVATION (30 minutes)**

1. Divide the participants into 4 groups of 4 - 6 members each.
2. Take the groups to one portion of the Learning Site (or to nearby upland/sloping field)
3. Based on the field situation and their own experiences and observations, ask the groups to determine what could have been the flow of nutrients in that kind of situation (how nutrients are utilized or how nutrients are lost during farming or cropping season) Give the groups 10 minutes to observe and discuss
4. Ask the groups to go back to their respective places in the plenary.
5. Give them a set of the materials listed above.
6. Tell them to organize their observations by illustrating the nutrient flow, utilization and loss.
7. Ask the participants to list down what must be done to make nutrient use efficient, or to keep soil loss minimal.

**B. PRESENTATION OF OUTPUTS (30 minutes)**

1. Gather the participants in a plenary.
2. Ask each to group to present the outputs for Activity 1

3. Ask each presenter to emphasize on the most critical points where nutrient loss is believed to be highest, and the ways to make nutrient use efficient, or to keep soil loss minimal/ tolerable.
4. Ask for additional comments or information from the other participants.
5. Process and synthesize learnings.

**Activity 2                      Workshop/Small Group Discussion**

Duration: 1 hour and 45 minutes

**Objectives:**

1. Measure participants, level of awareness and appreciation of the role of soil and water in sustainable agriculture;
2. Get the participants’ knowledge on soil erosion problems; and
3. Get the participants knowledge, experiences and practices in soil and water conservation.

**Materials:** Manila paper, cartolina/meta cards, marking pens, and masking tape or adhesives

**Procedure:**

1. Refer to the same groupings in Activity 1.
2. Give each group a set of the materials listed above.
3. Assign the groups separately to discuss the following topics:

**NOTE:** If there are more than 4 groups, one topic may be broken down to maintain small groupings and ensure adequate participation given limited time.  
**Duration of workshop/discussion: 30 minutes**

**Group 1 Topic 1:    The role of soil and water in upland agriculture and poverty alleviation**

*Guide the participants in listing down the benefits of soil and water conservation to agriculture and poverty alleviation.*

**Group 2 Topics 2:    The effects of improper use of land for farming**

*In the context of both upstream and downstream, ask the participants to enumerate or illustrate the effects improper use of land/farms on the following:*

- a. Landscape
- b. Lives of people

**Group 3 Topic 3: Factors affecting soil erosion**

*Guide the participants in listing down the factors that cause or accelerate soil erosion, by order of importance (or extent to which a factor causes the problem).*

**Group 4 Topic 4: Practices to conserve soil and water and prevent or minimize run-off**

*Guide the participants in listing down soil and water conservation practices they have observed, taught or personally adopted in their areas. Encourage them to illustrate or draw the practices.*

2. Give the groups 15 minutes to discuss and write/illustrate their outputs using Manila paper or meta cards.

**A. PRESENTATION OF GROUP OUTPUTS (45 minutes)**

1. Gather the participants in a plenary.
2. Ask each to group to present their outputs for Activity 2.
3. Ask the presenter to emphasize on the most critical points
4. Ask for additional comments or information from the other participants.

**B. THE RESOURCE PERSON PROCESSES AND SYNTHESIZES LEARNINGS. THEN, HE/SHE FILLS THE KNOWLEDGE GAPS BY ADDING INFORMATION THAT THE GROUPS MAY HAVE MISSED. (15 minutes)**

From the outputs of Groups 1, 2 and 3, the Resource Person looks for key words and phrases such as **lack of awareness on environmental degradation and protection, lack of concern on the environment, inappropriate farming/soil and water conservation practices, soil erosion, declining yields and incomes, and poverty.** Using the key words and phrases, he/she tries to illustrate the cycle of poverty in the uplands emphasizing the significant influence of lack of awareness and concern and inappropriate farming/soil and water conservation practices on the degree of soil erosion. He/she then describes the negative effects of soil erosion on yields and incomes on upland poverty. Finally, he/she connects poverty to lack of awareness and concern to complete the cycle.

If there were soil and water conservation practices that were missed by Group 4, the Resource Person discusses them using appropriate visual aids. He/she then proceeds to present the advantages, applicability and limitations of each SCW practice.

Before completing the processing of group outputs, the Resource Person emphasizes the significance of locating the contour line when recommending soil and water conservation structures or measures that serve as barrier such as hedgerows, rock walls, NVS, and others.

**Activity 3 Fieldwork (On-site demonstration and practicum)**

Duration: 1 hour and 30 minutes

**Objective:** Enhance participants' skills in constructing and calibrating an A-frame and in establishing contour lines

**Materials:** Bamboo pole or other locally available materials, common nails or tying materials, string, rock, bamboo or wooden stakes, slope indicator, bolo, hammer, meter stick, and evaluation tool

**Procedure:**

1. Refer to the same groupings in Activity 1 workshop.
2. Assign each group a specific land parcel or parcels of the
3. Learning Site or nearby farm (preferably a vacant one), with slope not more than 45%.
4. Before sending the groups to their respective land parcels of assignment, facilitate the demonstration of the construction and calibration of an A-frame. A participant who is knowledgeable in doing may be called to demonstrate. If there are 2 or 3 who can jointly do the demonstration, the better.
5. Encourage the participants to ask questions and clarifications if they have any, on the construction and calibration.
6. Facilitate a demonstration on locating the contour lines using the A-frame.
7. After the demonstrations, advise the groups to construct and calibrate their own A-frames, then guide them to their respective areas for a practicum on establishing contour lines.
8. Using the evaluation tool, EVALUATE the practicum by group, then by individual.
9. Process the experience and emphasize critical points and correct common mistakes.

**III. Summary/End of Session**

**IV. Evaluation (if any, aside from the graded/ corrected hands-on exercise)**

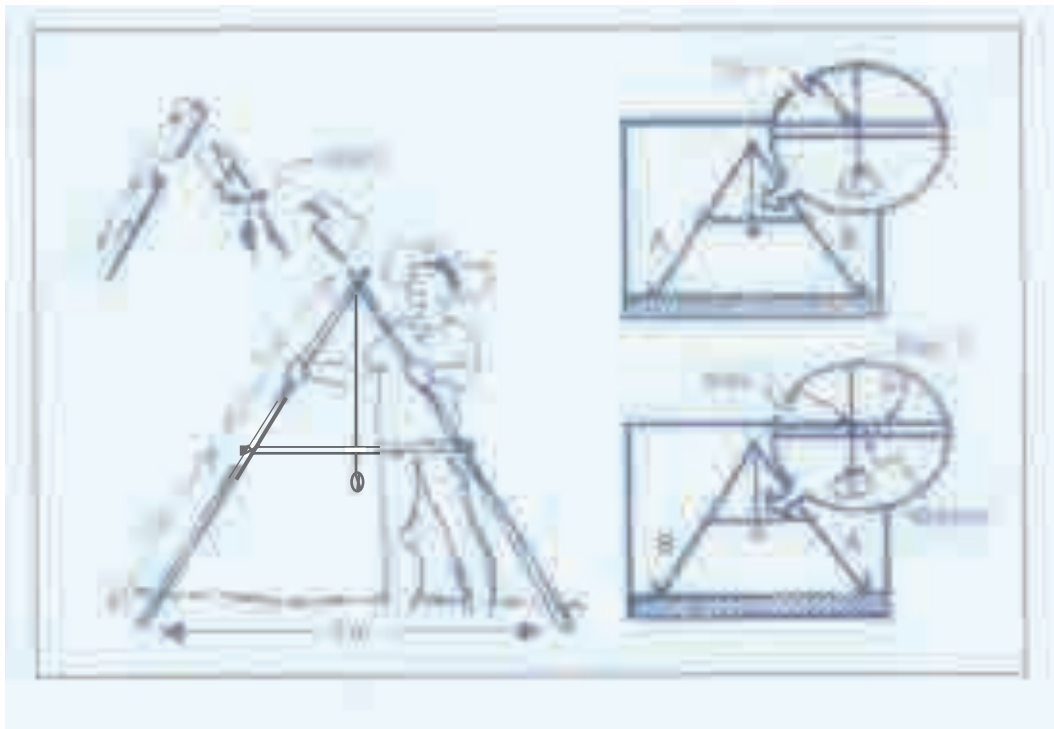
## SWC Field Guide

### ESTABLISHING CONTOUR LINES

Contour lines are usually established with the aid of surveying equipment, but practical instruments could also be used. A simple, easily constructed and most commonly used instrument is the A-frame. This is cheap and could be constructed using locally available materials.

#### I. Making an A-frame

1. Secure the following materials:
  - three wooden or bamboo poles about 4 cm in diameter, two of which should be around 2 m in length and the other about 1 m
  - sturdy string for tying or nail
  - a rock about the size of a fist or any similar heavy object to serve as bob
2. Tie tightly or nail the two longer poles at one end, about 10 cm from the end. The poles will serve as the legs of the A-frame. Make sure the poles are securely fastened to prevent them from slipping.



3. Spread the A-frame's legs and brace them with the shorter pole to make a figure "A". Tie tightly or nail the crossbar (about 10 cm from each end) to the middle of the legs of the A-frame. The crossbar will support the legs of the frame and will serve as guide in determining the level ground position.
4. Tie one end of the string to the midpoint where the two legs of the A-frame are joined.

5. Tie the other end of the string to the rock or any object for weight to serve as bob. The object should be heavy enough so that when suspended, it will not sway with the wind. The rock should hang about 20 cm below the crossbar.

#### II. Calibrating the A-frame

Before using, it is necessary to calibrate the A-frame to ensure accuracy. Calibrating the A-frame is finding its level mark. The following are the procedures in calibrating the A-frame:

1. Locate a reasonable level ground and place the A-frame in an upright position. Mark the spots where the legs (A and B) touch the ground. Mark on the crossbar where the bob string crosses.
2. Reverse the position of the A-frame's legs such that leg A is exactly on the same spot where leg B was and vice versa. Again, mark on the crossbar crossed by the bob string.
3. If the two marks are exactly on the same spot, this means that you have found the level mark of the A-frame and that the A-frame is standing on level ground. If the two marks are separated, mark the midpoint between them and that becomes the level mark of the A-frame.
4. Two points on the ground touched by the A-frame legs are of the same level if the bob string crosses at the level mark of the frame.
5. Check calibration from time to time.

#### III. Establishing the Contour Lines Using the A-frame

1. One person holds the A-frame while another marks the located contour lines.
2. Drive the first stake at the boundary of the area and position one leg of the A-frame beside and just above it.
3. Locate a spot in the ground that is of the same level with the first leg by adjusting the location of the second leg, such that the bob string crosses at level mark of the A-frame. Mark this point on the ground by driving another stake just below the second leg.
4. Make the A-frame and place the first leg to exactly where the second leg previously was. Repeat steps 1-3 until the contour lines are determined for the whole area.

Source: The Philippine Recommendations for Conservation Farming in the Sloping Lands, Vol.1. Contour Farming. Los Baños, Laguna: PCARRD-DOST and IWMI, 2001.

*Prepared by Alexander U. Tabbada*



Suggested References:

PCARRD. 2001. The Philippines Recommends for Conservation Farming in the Sloping Lands Vol. 1. Contour Farming. PCARRD. Los Banos, Laguna, Philippines.

SEARCA. 1998. Catalogue of Conservation Practices for Agriculture on Sloping Land. Gomez, A.G., D.E. Swete Kelly and M.T. Baril (eds). SEARCA, College, Laguna, Philippines.

Tabbada, A.U. 2003. Agroforestry: A Practical Option for Upland Development. Paper presented during the 2<sup>nd</sup> Mindanao Tree Farmers Congress held on 27-28 November 2003 at the Grand Menseng Hotel, Davao City, Philippines.

MODULE 4      LAND MANAGEMENT

Session 2      Slope Treatment Oriented Practices

Objectives	<p>At the end of the session, the participants should be able to:</p> <ol style="list-style-type: none"><li>1. Discuss current trends, issues and concerns specifically soil degradation due to upland farming;</li><li>2. Relate upland issues to lowland issues;</li><li>3. Apply principles of land management in hands-on farm planning;</li><li>4. Demonstrate correct use of STOP as a farm planning tool for assessing, classifying and mapping the upland farm’s features and capabilities;</li><li>5. Describe the various steps of Slope Treatment Oriented Practices (STOP) as a land management tool at the micro/ farm level; and</li><li>6. To acquaint participants on the various STOP technologies.</li></ol>
Suggested Methods	<p>Lecture and group discussion to be supplemented with visuals and manuals. Practicum/ field visit will be done to a selected farm site (which will also be the venue for field practicum for SWC and DFS topics)</p>
Learning Materials	<p>Slide Presentations or Flip Charts, Slope Indicator (SI)/Clinometer Land Unit Prescription Forms, sample farm plan</p>
Evaluation Methods	<p>Pretest, posttest, STOP fieldwork outputs, post activity paper</p>

Time Allotment	6.0 hours 1.5 hours input 2.0 hours field work 1.5 hours presentation of fieldwork outputs 1.0 hour processing and synthesis
Contents:	
A. Importance of the Uplands	1. Definition of the uplands 2. Importance of the uplands
B. Upland Development Issues	1. State of the uplands 2. Agriculture in the uplands: trends, issues and concerns
C. Land Management	1. Definition 2. The scope of land management 3. Land management technologies for sustainable agriculture
D. The Slope Treatment Oriented Practices or STOP	1. Definition of STOP 2. Purpose of STOP 3. The practice of a farm-scale land management through STOP-based farm planning 4. Doing the STOP procedures

**IMPORTANT:**  
*The Resource Person further discusses the topics to emphasize or include what have been left out in the discussions based on the following details of session contents:*

<u>TOPIC</u>	<u>MESSAGES</u>
Importance of the uplands	<p>The uplands (defined)-</p> <p>Areas above 100 meters above sea level meters (masl) and with slopes above 18%</p> <ul style="list-style-type: none"><li>• Life support system of the lowlands and aquatic areas</li><li>• Refuge for the poor</li><li>• Offer opportunities through farming, mining and forestry</li><li>• Contain the endangered tropical forest ecosystem</li></ul>

- Amplified, yet unattended issues on environmental and socio-economic conditions like poverty, peace and order.
- Vast potentials for sustainable development and socio-economic progress.
- Life support system of the lowlands and aquatic areas
- Refuge for the poor
- Offer opportunities through farming, mining and forestry
- Contain the endangered tropical forest ecosystem
- Amplified, yet unattended issues on environmental and socio-economic conditions like poverty, peace and order.
- Vast potentials for sustainable development and socio-economic progress.

Upland development issues

- A. The State of the Uplands**
1. Denuded landscape
  2. Shrinking land vis-a-vis increasing population
  3. Inheritance pattern
  4. Tenurial forms
  5. Degraded soils, soil erosion
  6. Increasing agricultural activities
- B. Agriculture in the uplands: trends, issues and concerns**
1. Massive encroachment and expansion on “forestlands”
  2. Farming on steep slopes
  3. Destructive farming practices that contribute to soil erosion
  4. Poor, degraded soil and declining yields
  5. Monocropping and other inappropriate farming systems
  6. Inadequate extension services
  7. Settlement, unrestricted cultivation and impracticality of depopulating upland farming communities- the need for practical solutions towards sustainable upland agriculture.

## Land Management

8. The need for **land management** that promotes appropriate farm planning, integrates soil and water conservation, and shift from monocropping to diversified farming system (DFS) that includes forest and fruit trees, in combination with short and medium- term farm components.

### A. Definition of Land Management

- **Land management** is the process of managing the use and development of land resources in a sustainable manner. (From Wikipedia)
- **Sustainable land management** - is the use of land to meet changing human needs while ensuring long-term socioeconomic and ecological functions of the land

### B. Scope of Land Management

Land management must be integral to both the lowlands and the uplands.

Sustainable land management combines technologies, policies, and activities aimed at integrating socioeconomic principles with environmental concerns, so as to simultaneously:

- ☞ sustain and enhance production (productivity)
- ☞ reduce production risk, and enhance soil capacity to buffer against degradation processes (stability/resilience)
- ☞ protect the potential of natural resources and prevent degradation of soil and water quality (protection)
- ☞ be economically viable (viability)
- ☞ be socially acceptable, and assure access to the benefits from improved land management (acceptability/equity)  
(Smyth and Dumanski, 1993)

### C. Land Management Technologies for the Uplands

1. Soil and Water Conservation or SWC
2. Slope Treatment Oriented Practices or STOP
3. Diversified Farming System or DFS

## The Slope Treatment Oriented Practices or STOP

### 1. Definition of STOP

A tool for land suitability classification designed for farm planning recommending appropriate site-specific soil and water conservation (SWC) measures and land use options.

### 2. Purpose of STOP

Promote appropriate farm planning where:

- Crops and other components are appropriately matched with slope of the parcels of the land, soil type, depth, slope gradients and other agro-ecological factors
- Soil conservation is integrated

### 3. The practice of a farm scale land management through STOP

A. Determining farmer's objectives, farm size, labor, markets for products and current land capability.

#### B. Steps in conducting STOP

1. "Bird's eye view" mapping of the various farm land units
2. Measuring the slopes of the various land units by using the slope indicator
3. Determining soil texture and measuring soil depth
4. Using the STOP table and determining the appropriate conservation treatment and intensity of land use. Note that with STOP, as slopes get steeper and soils become sandier:
  - Annual crops are replaced by agroforestry and forestry
  - Spacing of cross-slope barriers gets closer
  - On 45-55% slopes: plant tree crops in micro-basins, preferably using seeds, to encourage a long taproot
  - No hedgerows needed
  - Only forest cover is to be developed from seed above 55%. Tap-rooted species preferred.

- 5. Filling up the Land Unit Prescription Forms detailing the proposed crops and SWC measures for each land unit.
- 6. Drawing of second map showing the appropriate development interventions

Specific STOP interventions

- STOP 1:**  
Land unit farming- contour farming/ cultivation that promotes and emphasizing appropriate spacing between barriers/hedgerows.
- STOP 2:**  
Multi- storey tree cropping- mixture of fruit trees and industrial crops with different heights replace annual crops on steep and long slopes.
- STOP 3:**  
Mulching and zero tillage- applied where soils are too shallow (less than 100 cm deep) for forming terraces by maintaining present soil depth by preventing further soil movement down slope. Crops that efficiently use ground moisture are recommended.
- STOP 4:**  
Intensive production of annual crops on small level plots - recommended as alternative to upland farmers who only have slopes steeper than 55%, and are cultivating corn and other annual crops primarily for home consumption rather than as a cash crop. Its benefits are equally applicable to other farmers.

Session and Activity Guide  
SLOPE TREATMENT ORIENTED PRACTICES

- I. Introduction to the Session
- II. Session Proper

Activity 1      Small Group Discussion/Workshop

Duration: 25 minutes

- Objectives:
- 1. As ice breaker to the whole topic
  - 2. To get participants’ experiences and level of appreciation of the uplands as take off to bigger discussions and additional inputs;
  - 3. Bring the session in the context of land management and sustainable agriculture.

Materials: Manila paper and /or meta cards, marking pens, crayons and masking tape or adhesives

- Procedure:
- A. **SMALL GROUP DISCUSSION/WORKSHOP**
  - 1. Divide the participants into 4 groups of 4 - 6 members each.
  - 2. Give them a set of the materials listed above for their discussion and presentations at the plenary.
  - 3. Assign a facilitator to each group/ or ask the group to select a leader, a note taker and a presenter.
  - 4. Number each group. Then, assign them the following topic matches:

Group 1 Topic 1      Importance of the Uplands

*Guide the participants in listing down, discussing and illustrating (drawing) the benefits and potentials of the uplands to the communities, government, and civil society.*

Group 2 Topics 2      Upland Development Issues

*Ask the participants to discuss the issues and problems in the uplands: landscape, population, communities, services, plantations and the like.*

Group 3 Topic 3      Upland Agriculture Issues

*Tell the participants to discuss the issues and problems in upland agriculture in the context of the common, small holder’s farms (not plantations): soil, water,*



*technology, farming system, production, income and stability, extension services, government support and sustainability*

**Group 4 Topic 4** Present efforts/practices to address upland issues on soil erosion, technology, poor production, low income, encroachment and the like.

*Guide the participants in discussing and describe efforts/practices towards land management in their respective municipalities or barangays, for example, the Upland Development Programme and their LGUs.*

3. Give the groups 15 minutes to discuss and write/illustrate their outputs on the Manila paper or on the meta cards. At the 10<sup>th</sup> minute, remind the groups of the time and advise them to write/ draw/prepare their materials for the presentation.
4. Ask the groups to go back to their respective places and get ready for the presentations.

**B. PRESENTATION OF GROUP OUTPUTS (5 minutes each group or a total of 20 minutes)**

1. Gather the participants in a plenary.
2. Ask each group to present its outputs
3. Ask the presenter to emphasize on the most critical points
4. Ask for additional comments or additional information from the other participants.

**C. PROCESS/SYNTHESIS OF LEARNINGS by RESOURCE PERSON/ FACILITATOR**

Using appropriate visual aids, the Resource Person discusses further/validates the details and practices reported. Then he/she fills the knowledge gaps by inputting and emphasizing on STOP and the core messages listed at the beginning of this guide.

**Activity 2 Fieldwork** (On-site planning and demonstration on STOP)

Duration: 2 hours

Objectives:

1. To demonstrate STOP procedures to participants;
2. To enhance the skills of participants in farm planning using STOP.

Materials: Cartolina or Manila paper, slope indicator/clinometer, graphing paper, pencil, stakes/poles, STOP hands-on guide, Land Unit Prescription Forms (1 enlarged for the demonstration), evaluation tool

Procedure:

1. Refer to the same groupings in Activity 1 workshop. Take the groups to the field. Gather at the place where they get a good view of the whole farm.
2. Discuss with the farmer-cooperator the existing farm resources, land features and agro-ecological conditions (e.g. weather) that affect his/her farm activity.
3. Demonstrate to the big group the STOP procedure. Then ask each group to take turns in doing hands-on each of the steps, like measuring the slopes, classifying the soil types, and digging the soil to determine soil depths. Then demonstrate how to fill up the land unit prescription form (Have an enlarged copy of this form for the demonstration).
4. Encourage questions and verification from the participants.
5. Get back to the small groupings and assign each group an area to work on actual use of STOP procedure. Assign a facilitator to each group.
6. With their assigned facilitators and the STOP hands-on guide, advice the groups to proceed with the STOP hands-on exercise.
7. The group facilitator must assess/rate performance of each step, coach or correct, as needed. He/she must also rate correctness of the written and drawn outputs.  
Using the evaluation tool, EVALUATE implementation by group.
8. After group output has been done and corrected, the group facilitators must discuss further with their respective groups and get them ready for **individual hands-on** by each member (two members will be asked to assist each performing member)  
This is the individual EVALUATION portion of the activity. Allow a few minutes for the participants to practice. Using the evaluation tool, EVALUATE implementation by individual.
9. Process the experience and emphasize critical points and correct their common and individual mistakes.
10. Go back to the plenary for the processing and synthesis by main facilitator/Resource Person.

**III. Summary/End of Session**

**IV. Evaluation ( if any, aside from the graded/ corrected hands-on)**

v.    **Reflection**

As reflection activity, ask the participants to write their thoughts on the following points. This must be submitted to the facilitator in the morning of the next day.

**Reflection Points:**

1. What do you think of regulating agriculture land use in the uplands?
2. What do you think hinders farmers to practice proper land management in their area?
3. Considering the detailed requirements and specific steps of STOP, do you find this practical/feasible for most upland farmers?

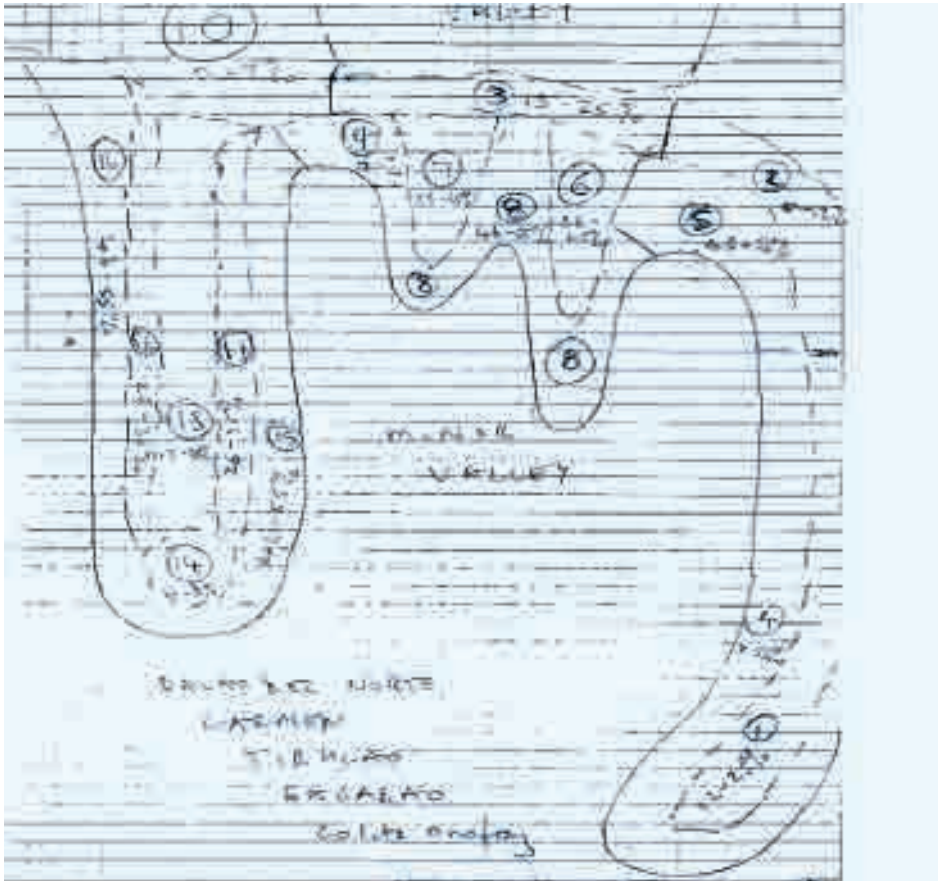
*Prepared by: Ben-Hur Vilorio. With inputs from Kenneth RS Proud, UDP Expatriate TA.*

**STOP Fieldwork Guide**

**STEPS IN USING THE SLOPE TREATMENT ORIENTED PRACTICES**

**STEP 1: Draw a map showing the distribution of land units on farm**

- Go to the highest point on the farm, if practical, and draw a “bird’s eye” view of the whole farm (*not* an oblique view of one hectare)
- Obvious changes, or breaks in slope indicate a change from one land unit to another.
- Identify each land unit with a number on the map.



LAND UNIT AND SLOPE MAP

STEP 2: Determine the slope using SLOPE INDICATOR

The Slope Indicator (SI) is a tool used to estimate the slopes to guide various land use options. It is made of a handy and durable acetate sheet with horizontal and a vertical axis. It can help locate the least steep areas or those with best potential for arable cropping.

1. Attach a weight, e.g. a large paper clip or a ball pen, to a 30 cm long piece of string or thread. This is the *plumb bob* that ensures the *Slope Indicator* is level.



- a) Clip the *plumb bob* securely to the *Slope Indicator* using a bulldog clamp or paper clip and position the *plumb bob* so it coincides with the vertical axis on the *Slope Indicator*.



- b) Hold the *Slope Indicator* upright and tilt it until the string of the *plumb bob* exactly follows the vertical axis. The *Slope Indicator* is then level. Keep the *Slope Indicator* level and line it up along the farm slope. Note which lines on the Indicator the farm slope falls between. This is the approximate gradient of the land

STEP 3: Determine the soil texture in the field

It is important to know the texture of the soil because this is one factor that affects soil erosion and water holding capacity or water retention. For example, sandy and sandy loam soils are more erodible than other textures, especially when cultivated/plowed. These soils also have lower water holding capacity. Crops may tend to suffer from severe moisture stress, even during the rainy season.

After determining the slope of the land, follow the instructions in the following *Hand Tests to Determine Soil Texture in the Field* to identify the soil type on the land. For each major change in slope you should check whether there has been a change in soil texture.

HAND TEST TO DETERMINE SOIL TEXTURE IN THE FIELD

The extent to which moist soil can be shaped by the hand is indicative of its texture.





METHOD




1. Pick up a handful of soil (without stones) from the slope.
2. Slowly drip water on to the soil and mix it well into the soil until it starts to stick to the hand.
3. Form the sample according to each of the following illustrations until the next one is no longer possible:

- 1) The soil remains loose and single grained and can only be heaped into a pyramid:



SAND (1)

2)	The soil contains sufficient silt and clay to become cohesive and can be shaped into a ball that easily falls apart:		LOAMY SAND (2)
3)	The soil can be rolled into a short thick cylinder:		SILT LOAM (3)
4)	The soil can be rolled into a cylinder about 15 cm long:		LOAM (4)
5)	The soil can be bent into a U:		CLAY LOAM (5)

5)	The soil can be bent into a U:		CLAY LOAM (5)
6)	The soil can be bent into a circle that shows cracks:		LIGHT CLAY (6)
7)	The soil can be bent into a circle without showing cracks:		HEAVY CLAY (7)

**Note:** Texture classes (1) to (4) are sandy to silty soils and generally have good infiltration. Texture classes (5) to (7) are clayey soils that have generally poor infiltration but have a higher potential for arable agriculture.

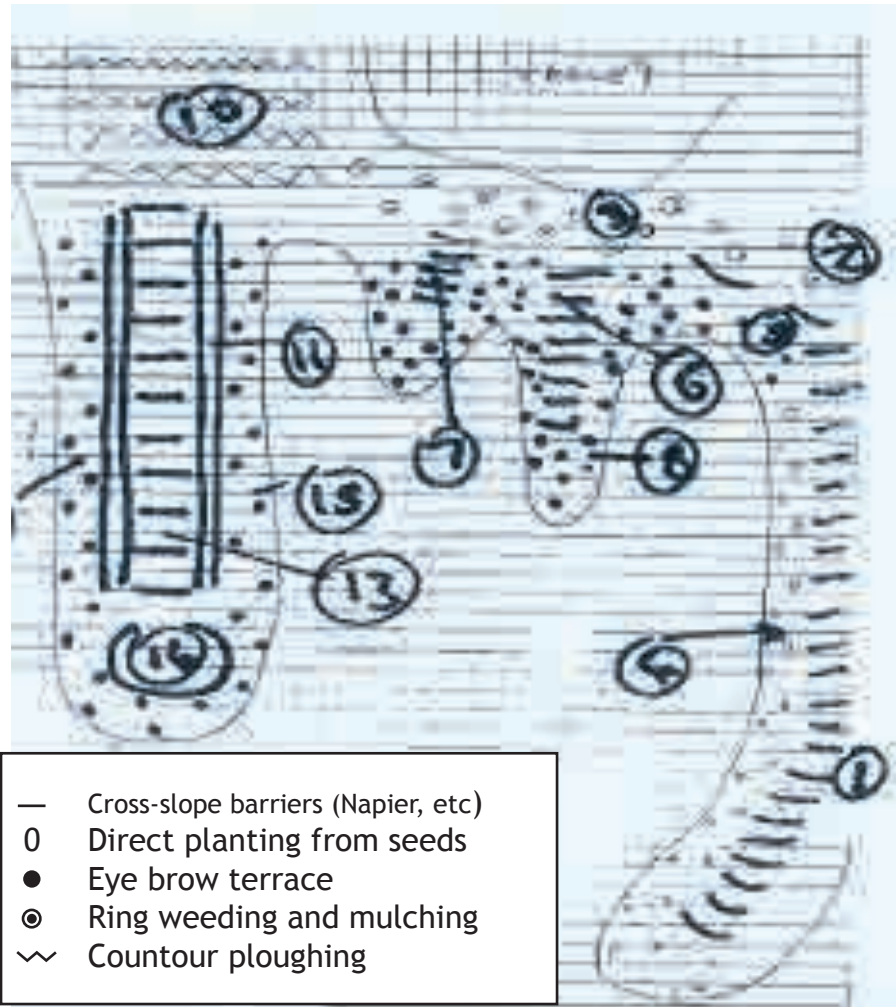


**STEP 4:** Using the STOP table, determine the appropriate conservation treatment and intensity of land use. Note that with STOP, as slopes get steeper and soils become sandier thus: Fill out the land unit prescription form (attached)

**STEP 5:** Fill out the land unit prescription form (attached)

**NOTE:** There are examples of how to use the LAND UNIT PRESCRIPTION FORM, one showing projected inputs for SWC, and the other showing projected incomes per land unit.

**STEP 6:** Prepare the map showing layout of SWC measures.



**Discussion Points for Participating ATs:**

1. What do you think of regulating agriculture land use in the uplands?
2. What do you think hinders farmers to practice proper land management?
3. Considering the detailed requirements and specific steps of STOP, do you find this practical/feasible for most upland farmers?

**SLOPE TREATMENT-ORIENTED PRACTICES FOR STEEP LANDS (STOP) Modified 16 Dec 2004**

**OBJECTIVE:** To produce a series of outward sloping bench terraces with a minimum soil depth of 50 cm at the back of the terrace.

Max. slope (%)	Min. soil depth (cm)	Sandy – Loam soils		Clay loam– Clay soils	
		Soil and Water Conservation treatments	Maximum intensity of land-use between NVS/ hedgerows	Soil and Water Conservation treatments	Maximum intensity of land-use between NVS/ hedgerows
12%	50 cm	Contour cultivation	Any. Fallow with forage peanut.	Contour cultivation.	Any. Fallow with forage peanut
25%	100 cm*	Contour hedgerows or strips of Vetiver or Napier grass with 2-m wide NVS and 3-m wide cultivable strip <sup>2</sup>	Relay planting with rice/maize- root crops-beans-peanuts to suppress weeds.	Contour hedgerows or strips of Vetiver or Napier grass with 2-m wide NVS and 3-4.5 m wide cultivable strip <sup>2</sup> . Contour ploughing to form terraces <sup>3</sup> .	Rotations of corn, root crops and legumes. Relay planting of rice or corn-root crops-beans-peanuts to suppress weeds.
35%	100 cm	No hedgerows. Vetiver or Napier grass strips with 2-m wide NVS, and 2.5 m wide cultivable strip) <sup>2</sup> . Zero tillage. Heavy mulching.	Gradually replace maize and root crops with fruit trees planted among close cover crops and semi-perennials.	Vetiver or Napier grass strips with 2-m wide NVS and 3-3.5 m wide cultivable strip <sup>2</sup> . Contour ploughing to form terraces <sup>3</sup> . Mulching.	Rotations of corn and legumes. Relay planting of rice or corn-beans-peanuts to suppress weeds.
45%	100 cm	No hedgerows. Vetiver or Napier strips with 2-m wide NVS. And 2-m wide cultivable strip <sup>2</sup> . Zero tillage, Heavy mulching	Replace maize and root crops with agroforestry model of semi-perennials and fruit trees. No cultivation of beans and peanuts after 3 years.	Vetiver or Napier grass strips with 2-m wide NVS and 3 m wide cultivable strip <sup>2</sup> . Contour ploughing to form terraces <sup>3</sup> . Heavy mulching	As above. If ploughing is not possible, replace corn and root crops with agroforestry model of fruit trees planted among close cover crops and semi-perennials, over three years.

Max. slope		Min. soil depth	Sandy – Loam soils		Sandy – Loam soils	
55%		100 cm	No hedgerows. Grass cover. Direct seeding and mulching around young trees	No cultivation Tree crops and grass cover	Vetiver or Napier grass strips with 2-m wide NVS and 2 m wide cultivable strip <sup>2</sup> . Contour ploughing to form terraces <sup>3</sup> . Heavy mulching	Agroforestry model of semi-perennials and fruit trees.
65%		50 cm	Grass cover. Direct seeding and mulching of trees	No cultivation. Forest trees and grass only.	Grass cover. Direct seeding and heavy mulching of trees	No cultivation Tree crops and grass cover only.
>65%		-	None suitable.	No cultivation. Forest trees and grass only	None suitable	No cultivation. Forest trees and grass only

\* A slope with 100 cm depth of soil will give a terrace with 50 cm depth of soil below the hedgerow at the spacing indicated.  
<sup>2</sup> The indicated cultivated strip width is the maximum permissible for 100 cm depth of soil, if 50 cm soil is to remain at the back of the terrace <sup>3</sup>Advisable to follow contour ploughing on slopes above 12% with a harrowing to obliterate furrows which, if not exactly on the contour, channel run-off to low points causing gullies

LAND UNIT RECOMMENDATION/PRESCRIPTION FORM

P rovince:	Mun.	Brgy:	Sitio:
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Farmer name:  
Family size:  
Farm area:  
Land tenure:

Ann. food requirements:

Corn:                      sacks  
Vegetables                sacks  
Roots:                      sacks  
  
Fruits:                      sacks  
  
kg  
kg  
kg  
  
kg

LAND UNIT		Site factors	Prescriptions / Recommendations	Projected yields/ incomes
1 * Shape+ Width m Length m Area: (W x L)		Slope: % Soil texture Soil depth:cm Erosion: Stoniness: Land use:		
2 * Shape+ Width m Length m Area: (W x L)		Slope: % Soil texture Soil depth:cm Erosion: Stoniness: Land use:		
3 * Shape+ Width m Length m Area: (W x L)		Slope: % Soil texture Soil depth:cm Erosion: Stoniness: Land use:		

LAND UNIT		Site factors	Prescriptions / Recommendations	Projected yields/ incomes
4 *	Shape+ Width m Length m Area: (W x L)	Slope: % Soil texture Soil depth:cm Erosion: Stoniness: Land use:		
	5 *	Slope: % Soil texture Soil depth:cm Erosion: Stoniness: Land use:		
	6 *	Slope: % Soil texture Soil depth:cm Erosion: Stoniness: Land use:		
	6 *	Slope: % Soil texture Soil depth:cm Erosion: Stoniness: Land use:		

\* Describe as Crest, Ridge, Spur, Upper Slope, Mid-slope, Foot slope, Minor valley  
+ Describe as: *Convex, Concave, Straight* or *Compound* (i.e. Concavo-Convex)

LAND UNIT		Site factors	Prescriptions / Recommendations	Projected yields/ incomes
7 *	Shape+ Width m Length m Area: (W x L)	Slope: % Soil texture Soil depth:cm Erosion: Stoniness: Land use:		
	8 *	Slope: % Soil texture Soil depth:cm Erosion: Stoniness: Land use:		

\* Describe as Crest, Ridge, Spur, Upper Slope, Mid-slope, Foot slope, Minor valley  
+ Describe as: *Convex, Concave, Straight* or *Compound* (i.e. Concavo-Convex)

Agricultural Technologist : \_\_\_\_\_  
Cooperator: \_\_\_\_\_

Signature: \_\_\_\_\_  
Signature: \_\_\_\_\_

Reference:

Proud, KRS. Slope Treatment Oriented Practices for Sustainable Upland Farming and Soil Conservation. Sustainable Agriculture Development Component, Upland Development Programme Handout. May 2005

MODULE 4

LAND MANAGEMENT

Session 3

Diversified Farming System

Session	At the end of the session, the participants should be able to:
Objectives	<div><div>1. Discuss the principles of diversification;</div><div>2. Enumeratetheadvantagesandlimitations of a diversified farming systems;</div><div>3. Relate the various components of diversified farm to land management;</div><div>4. Map out a diversified farm using the information from exercises on SWC and STOP.</div></div>
Suggested Methods	Experiential sharing, group discussion, site visit, lecture and hands-on exercise
Learning Materials	Slide presentations, hand-outs, flipcharts, pictures, papers, pencils cartolina or Manila paper, crayons, slope indicator, graphing paper, handout, sample farm plans based on STOP
Evaluation Methods	Graded fieldwork/demonstration
Time Allotment	4.0 hours



Content

- A. The Diversified Farming Systems (DFS) approach
- B. The advantages and limitations of a monocropping farming system
- C. The advantages and limitations of farm diversification
- D. Considerations for a successful and functional DFS
- E. Activities that promote DFS and proper agricultural land management

**IMPORTANT:**

***The Resource Person further discusses the topics to emphasize or include what have been left out in the discussions based on the following details of session contents:***

**TOPIC**

**MESSAGES**

**Diversified Farming System (DFS) and Its Components**

- 1. Sustainable farming system that highlights the function and integration of its various components namely:
  - Farm household
  - Food lot
  - Cropping area for short, medium and long term
  - Livestock and fisheries production area
  - Tree component
  - Soil and water conservation measures
  - Spring water source and protection measures
- 2. Maximizing production per unit area by adding/ integrating more crops (both sequentially or spatially) and recycling of farm wastes to be used as organic fertilizer or even fodder for livestock
- 3. Various technologies that are similar and containing DFS principles
  - Sloping Agricultural Land Technologies (SALT 1 to 4)
  - Agroforestry
  - Conservation Farming
  - Integrated Farming Systems

**The Advantages and Limitations of Monocropping**

**Advantages**

- ☞ Monocropping means “easier” farm planning and management
- ☞ Technology needs are more specific

**Limitations**

- ☞ Monocropping poses high risks for crop failure
- ☞ Inadequacy to meet the nutritional needs of the family and uncertainty of food security
- ☞ Diminishing soil fertility which causes declining crop yields leading to poverty
- ☞ Proliferation of undesirable soil microorganisms, insects and pests accustomed to monocrops thus enhancing infestation and rapid disease outbreaks.
- ☞ Monocropping leads to soil nutrient imbalance and eventually poor soil quality
- ☞ Soil degradation is not only brought about by erosion but also by hardening of the soil structure due to insufficient level of organic matter.
- ☞ Family labor is constrained during the monocrop planting period and is unequally distributed within the year.
- ☞ Portions of farm remain idle in certain parts of the year thus lessening production opportunities.

**The Advantages and Limitations of Farm Diversification**

**Advantages**

- 👉 Maximum production and profitability with sustainable utilization of farm resources
- 👉 Maximizes income on limited land and consequently minimizes the pressure on forest land caused by encroaching and expansion of unsustainable farming practices
- 👉 Diversity of marketable products also serves as an effective buffer against economic and biological risks. It lowers farming risks and provides back-up system for mono-crop failures due to factors like pest, diseases, drought etc.
- 👉 Increase in vegetative cover brought about by multi-cropping also mean reduced soil erosion problems. Biodiversity could also be enhanced by providing a conducive environment for more variety and balanced population of organisms.

- 👉 Establishment of permanent crops like timber and fruit trees which serve as “pension” and “education” plans for the household and double as permanent vegetative cover for soil and water conservation.
- 👉 Increased land value due to permanent crops
- 👉 Equitable distribution of farm labor all year round providing more opportunity for self-employment.
- 👉 As crop rotation is a necessary practice in DFS, there will be reduced incidence and economical control of crop pests, diseases and infestation of weeds.
- 👉 DFS shows the possibility of harmonizing the concerns on resource conservation and improvement of income.
- 👉 DFS integrates indigenous knowledge and local practices.

**Limitations**

- 👉 More information and technology needs of farmers
- 👉 Different components demand more systematic farm planning and management
- 👉 Marketing limitations due to volume requirement for one single product
- 👉 More investment for labor

**Considerations for  
a Successful and  
Functional DFS**

1. Production that would address various household needs-
  - Clean and safe food for the family
  - Additional income
  - Shelter
  - Fodder for livestock
  - Fuel wood and even medicine (herbal gardens and trees with medicinal properties)
2. Environmental service which has long term impact and benefits
  - Establishment of SWC measures that would arrest land degradation
  - Soil amelioration and restoration of soil fertility
  - Establishment of more trees and vegetation that provide shade and soil cover
  - Tree establishment not only as boundary markers/fence but also as windbreaks
3. Socio-economic benefits specifically for securing land tenure and proper land management that could assure technical and financial assistance in the future.
4. Easy to adopt by other farmers

**Activities That  
Promote DFS and  
Proper Agriculture  
Land Management**

1. Crop matching that emphasizes integration and crop suitability to existing soil characteristics and other agro-ecological factors (e.g. weather, slope limitations, etc.)
2. Establishment of appropriate soil and water conservation measures
3. Proper soil management that helps in moisture retention, nutrient regeneration and improvement of soil pH
4. Use of improved quality of planting materials and livestock/fish breeds
5. Relay cropping, crop rotation and multi-storey farming technologies
6. Judicious use of inorganic fertilizers (as a fast acting nutrient source) in complement with organic fertilizers (for improving soil texture and long term quality) for improved crop production
7. Practice of integrated pest (including weed) management technologies
8. Improved farm practices from land preparation, grow-out to harvest, post-harvest and marketing

**Session and Activity Guide**

**DIVERSIFIED FARMING SYSTEMS**

**I. Introduction to the Session**

**II. Session Proper**

**Activity 1 Farm Visit**

Duration: 1 hour

**Objectives:**

1. To give participants first hand exposure to diversified farming system and assess its advantages and limitations;
2. To enable the participants to recommend alternative options for the improvement of the farm in the context of appropriate land management for productivity, income, food and other needs

**Materials:** Manila paper and/or cartolina, marking pens, and masking tape or adhesives

**Procedure:**

**A. FIELD OBSERVATION (30 minutes)**

1. Divide the participants into 4 groups of 4 - 6 members each.
2. Ask each group to select a leader and a documenter or secretary. OR Assign each group at least one facilitator/Resource Person.
3. Take the groups to a pre-selected diversified farm nearby.
4. Based on the field situation and their own experiences ask the group to take note of the following:
  - a) Size of farm
  - b) Farm components (crops, trees, livestock, fish, others)
  - c) Arrangements of the different components (combinations, locations in the farm, etc.)
  - d) Which components are related to one another, which are not related to any of the others
5. Ask the groups to go back to their respective places.
6. Give them a set of the materials listed above.
7. Tell them to organize their observations and determine the strengths and weaknesses of the farm that was visited
8. Ask the participants to list down what must be done in order to improve on the farm.

**B. PRESENTATION OF OUTPUTS (45 minutes)**

1. Gather the participants in a plenary.
2. Ask each to group to present its output
3. Ask each presenter to emphasize on the most important points like the relationships or interdependence among the different components, the contributions each component gives to the whole system, the effectiveness of the soil and water conservation measures and the sustainability of the farm.
4. Ask for additional comments or additional information from the other participants.
5. Process and synthesize learnings.

**Activity 2 Farm planning**

Duration: 2 hours

**Objectives:**

1. Increase the participants' level of awareness and appreciation of conservation farming; and
2. Enhance the participants' knowledge and skills in planning sustainable diversified farming systems using STOP as guide.

**Materials:** Manila paper and /or meta cards, marking pens, and masking tape or

adhesives

**Procedure:**

1. Refer to the same groupings in Activity 1.
2. Ask each group to select a leader and a documenter or secretary. OR Assign each group at least one facilitator/Resource Person.
3. Give each group a set of the materials listed above.

**A. FIELDWORK (1 hour)**

1. Bring each group to a farm nearby (preferable vacant, not cultivated)

**NOTE:** If there are more than 4 groups, one topic may be broken down to maintain small grouping and ensure adequate participation given limited time.

2. Each group, together with the farmer-owner, prepares a farm plan using STOP and knowledge on SWC. The group may consider describing the farm landscape, assessing the conditions and recommending suitable technologies to address diversification and conservation needs.

**B. PRESENTATION OF GROUP OUTPUTS (40 minutes)**

1. Gather the participants in a plenary.
2. Ask each to group to present their outputs for Activity 2.
3. Ask the presenter to emphasize on the most critical points.
4. Ask for additional comments or information from the other participants.

**C. THE RESOURCE PERSON PROCESSES/SYNTHESIZES LEARNINGS.**

**THEN, HE/SHE FILLS THE KNOWLEDGE GAPS BY SHARING INFORMATION THAT THE GROUPS HAD MISSED. (20 minutes)**

**III. Summary/End of Session**

**IV. Evaluation (if any, aside from the graded/ corrected hands-on)**

*Prepared by: Ben-Hur R. Vilorio. With inputs from Alexander U. Tabbada.*

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**Suggested References:**

(Various UDP publications on DFS, IFS and STOP.)

Tabbada, Alexander U. Agroforestry: A Practical Option for Upland Development. Paper presented during the 2<sup>nd</sup> Mindanao Tree Farmers' Congress held on 27 - 28 November 2003 at Grand Menseng Hotel, Davao City, Philippines.



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# ANNEXES

**Annex 1** Participants to the Presentation and Enhancement of UDP Modules on Agricultural Extension and Land Management held in Malagos Garden, Davao City on June 15-16, 2005.

	NAME	POSITION/ DESIGNATION	OFFICE	STATION
1.	Richard Rubis	Center Director	ATI 11	Davao del Norte
2.	Ma. Theresa Ferolino	Sr. Agric	ATI 11	Davao del Norte
3.	Ofelia Sanchez	TS II	ATI- 11	Davao del Norte
4.	Simona Gregorio	TS II	ATI 12	South Cotabato
5.	Efraim Nicolas	Center Director	ATI 12	South Cotabato
6.	Maria Nila Develleres	TS III/ACD	ATI 12	Davao del Norte
7.	Elsa Parot	Sr. Agric	ATI National	Quezon City
8.	Reynaldo Palacio	AT	LGU- OPAg	South Cotabato
9.	Christopher Malayan	AT	LGU-MAGRO	Laak
10.	Cipriano Pandita	MA	LGU-OMAG	Malapatan
11.	Benhur Vilorio	SAD Coordinator	UDP	PMO
12.	Nelson Casiano	CIDE Coordinator	UDP	PMO
13.	Dinah Tabbada	TA	UDP	PMO
14.	Alexander Tabbada	Project Team Leader	ICRAF	PMO
15.	Maryluzilla Importante	Professor & Extension Coordinator	USEP	Compostela Valley

**Annex 2** Resource Persons and Coaches during the Training Of Trainers (TOT), October 2005 - April 2006.

**Nelson P. Casiano**

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Upland Development Programme in Southern Mindanao  
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**Alexander U. Tabbada**

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Upland Development Programme in Southern Mindanao  
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**Kenneth RS Proud**

Expatriate TA , Upland Farming/SWC Specialist  
Upland Development Programme in Southern Mindanao  
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**Efraim C. Nicolas**

Assistant Center Director for Administration  
Agricultural Training Institute XII  
San Felipe, Tantaran, South Cotabato



**Annex 3** List of **Regional Trainers** who completed the Training of Trainers (TOT) on Agricultural Extension and Land Management from October 2005 to April 2006.

*Notes:*

	Name	Region	Category	Agency	Province/ City	Position
1.	Bastian, Ceferino	11	SCU	USEP	Davao del Norte	Assoc. Professor
2.	Bayaron, Teresita	11	SCU	DNSC	Davao del Norte	Instructor
3.	Calungsod, Felicisimo, Jr.	11	SCU	DOSCST	Davao Oriental	Assoc. Prof II
4.	Casquijo, Felipe	11	PLGU	PAGRO	Davao del Norte	Ag. Tech
5.	Corcino, Maria	11	SCU	DNSC	Davao del Norte	Instructor
6.	Dalisay, Christopher	11	PLGU	PAGRO	Davao del Norte	Ag. Tech
7.	Develleres, Maria Nila	11	Reg GA	ATI	Davao del Norte	Training Spec III / ACD
8.	Divino, Dario	11	CLGU	CAO	Davao City	Agriculturist
9.	Edullantes, Carlito	11	SCU	USEP	Compostella Valley	Professor
10.	Gutierrez, Grace	11	Reg GA	DA- RFU-SMIARC	Davao City	Agriculturist II
11.	Heferverez, Merilyn	11	SCU	SPAMAST	Davao del Sur	Instructor I
12.	Lamata, Leon	11	PLGU	OPAg	Davao del Sur	Ag. Tech
13.	Magdato, Fernando Jr	11	SCU	USEP	Davao del Norte	Instructor
14.	Mejos, Josefa	11	PLGU	OPAg	Davao Oriental	Ag. Tech
15.	Omboy, Arlene	11	SCU	SPAMAST	Davao del Sur	Instructor
16.	Rubis, Richard	11	Reg GA	ATI	Davao del Norte	Center Director
17.	Sanchez, Ofelia	11	Reg GA	ATI	Davao del Norte	Training Spec II
18.	Sanchez, Greta	11	MLGU	MAO	Davao Oriental	Ag. Tech
19.	Tabora, Joselito	11	CLGU	CAO	Davao City	Ag. Tech
20.	Tambalque, Ruel	11	PLGU	OPAg	Davao del Sur	Ag. Tech
21.	Asturias, Arnold	12	PLGU	OPAg	Sarangani	Engr.II
22.	Bayan, Charito	12	PLGU	PAGO	Sultan Kudarat	Ag Engr
23.	Beldia, Jessie	12	Reg GA	ATI	South Cotabato	Info Officer II
24.	Catbagan, Alberto	12	PLGU	OPA	North Cotabato	Ag. Tech
25.	De Guzman, Rolando II	12	PLGU	PAGRO	Sultan Kudarat	Engg Asst
26.	Fabrigar, Reynaldo	12	PLGU	OPAG	South Cotabato	Com. Devt. Asst
27.	Golingay, Ernesto	12	SCU	SuNAS	South Cotabato	Instructor I
28.	Leysa, Norberto	12	CLGU	CAO	South Cotabato	Agriculturist II
29.	Lumen, Rogaciano	12	Reg GA	DA-RFU-CEMIARC	Sultan Kudarat	Agriculturist II
30.	Manipod, Naruddin	12	SCU	MSU	Gen Santos City	Community Affairs Asst
31.	Maute, Vilma	12	Reg GA	DA-RFU	Cotabato City	Agriculturist II
32.	Nasiluan, Gabriel	12	PLGU	OPA	North Cotabato	Ag. Tech
33.	Pagarigan, Simona	12	Reg GA	ATI	South Cotabato	Training Spec II
34.	Pico, Norma	12	Reg GA	NCIP	South Cotabato	Devt Mgt. Off II
35.	Siao, Lucky Jr.	12	PLGU	OPAg	Sarangani	Ag. Tech
36.	Soriano, Jimmy	12	PLGU	OPAg	Sarangani	Ag. Tech
37.	Wawa, Marybeth	12	SCU	SKSPC	Sultan Kudarat	Instructor II

*Regional Trainers and their distribution by Region, Government Units and/or Agency.*  
*(Note: SCUs and agencies of regional scope are identified with the provinces where they are physically located).*