

ANNEX-VIII

***RESULTS OF PROBLEM ANALYSIS
WORKSHOP***

ANNEX-VIII

Results of Problem Analysis Workshop

Contents

	<u>Page</u>
Chapter VIII-1 Problem Analysis Workshop	VIII-1

List of Figures

	<u>Page</u>
Fig. VIII-1 Problem Tree in Lhuntse Dzongkhag.....	VIII-F1
Fig. VIII-2 Problem Tree in Mongar Dzongkhag.....	VIII-F2
Fig. VIII-3 Selected Approaches with Objective Tree in Lhuntse Dzongkhag Summarized by Dzongkhag Officers	VIII-F4
Fig. VIII-4 Selected Approaches with Objective Tree in Lhuntse Dzongkhag Summarized by Gewog Leaders	VIII-F10
Fig. VIII-5 Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Dzongkhag Officers	VIII-F14
Fig. VIII-6 Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Close Gewog Leaders	VIII-F19
Fig. VIII-7 Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Remote Gewog Leaders.....	VIII-F23

ANNEX-VIII

RESULTS OF PROBLEM ANALYSIS WORKSHOP

Chapter VIII-1 PROBLEM ANALYSIS WORKSHOP

VIII-1.1 Problem Analysis Workshop

Problem Analysis Workshop were conducted with Dzongkhags' staffs and Gewog leaders (one session in Lhuntse Dzongkhag and two sessions in Mongar Dzongkhag) in charge of planning of agriculture and farm road development. Participants from Mongar Gewog leaders were divided to two parties: close Gewog and remote gewog. Two day were used for each workshop: one day for problem analysis, half day for objective analysis and half day for approaches selection.

Participants for each workshop are summarized below. Results of analysis are summarized in Fig. VIII-1 to VIII-7.

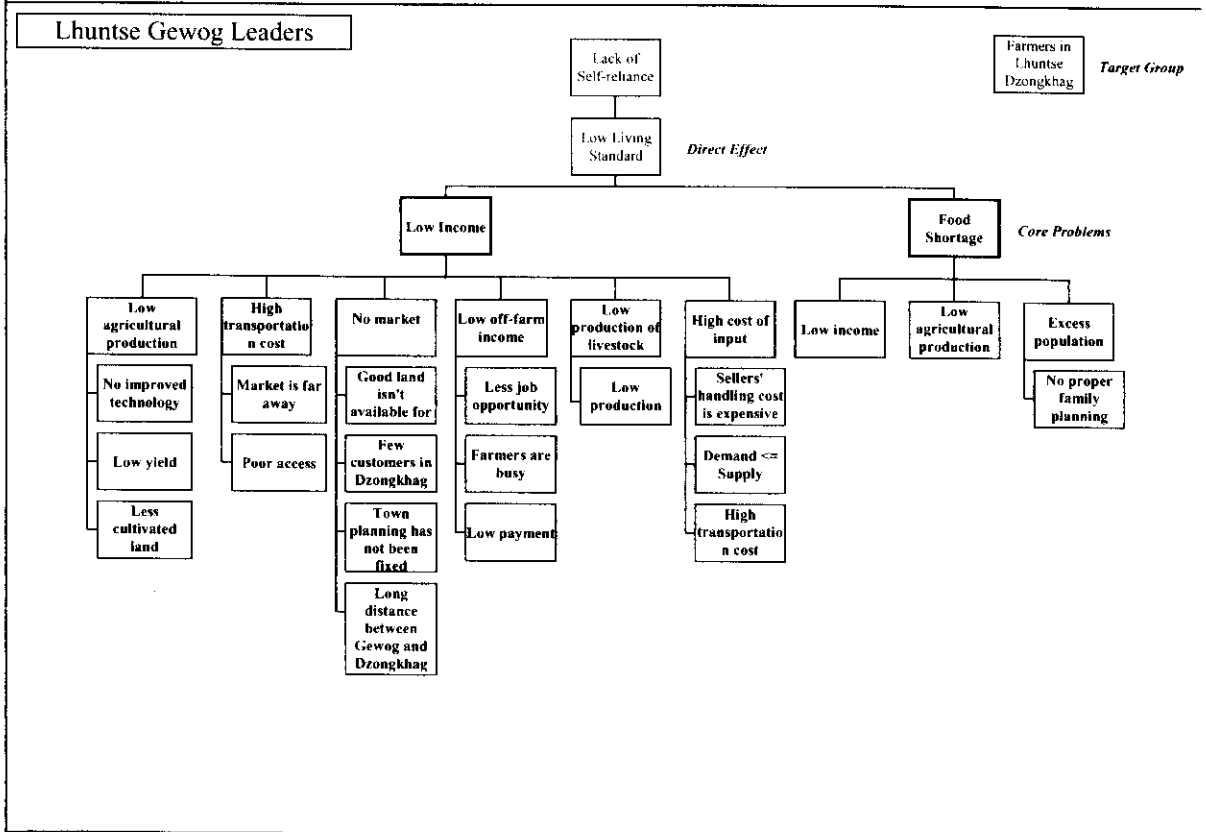
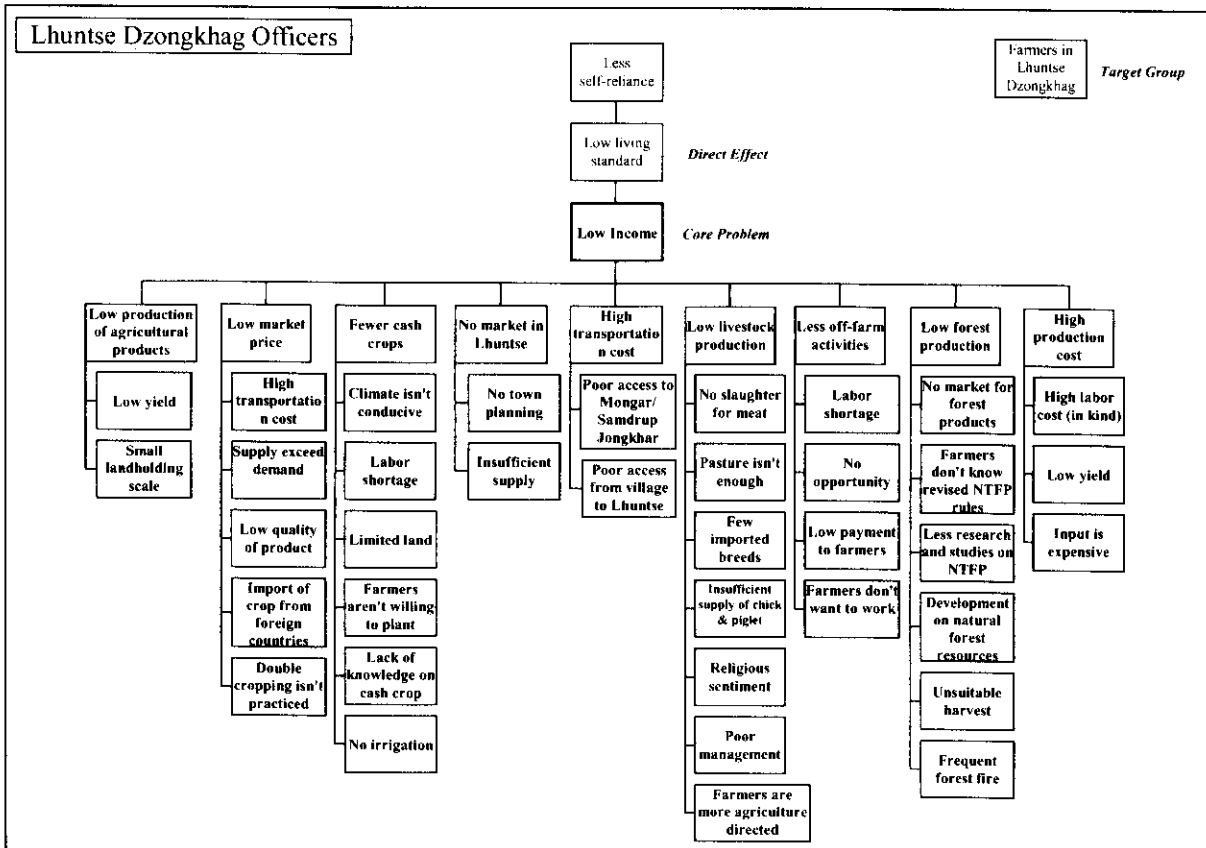
Participants for PCM Workshop with Dzongkhags' Staffs

	Lhuntse	Mongar
RNR Section and Planning Office	5	4
Other Section	3	5
Total	8	9

Participants for PCM Workshop with Gewog Leaders

	Lhuntse	Mongar (Close Gewog)	Mongar (Remote Gewog)
Gup/Mangmi	8	5	7
EA for Agriculture	4	7	9
EA for Livestock	3	6	3
Others (Forest Ranger)	2	1	1
Total	17	19	20

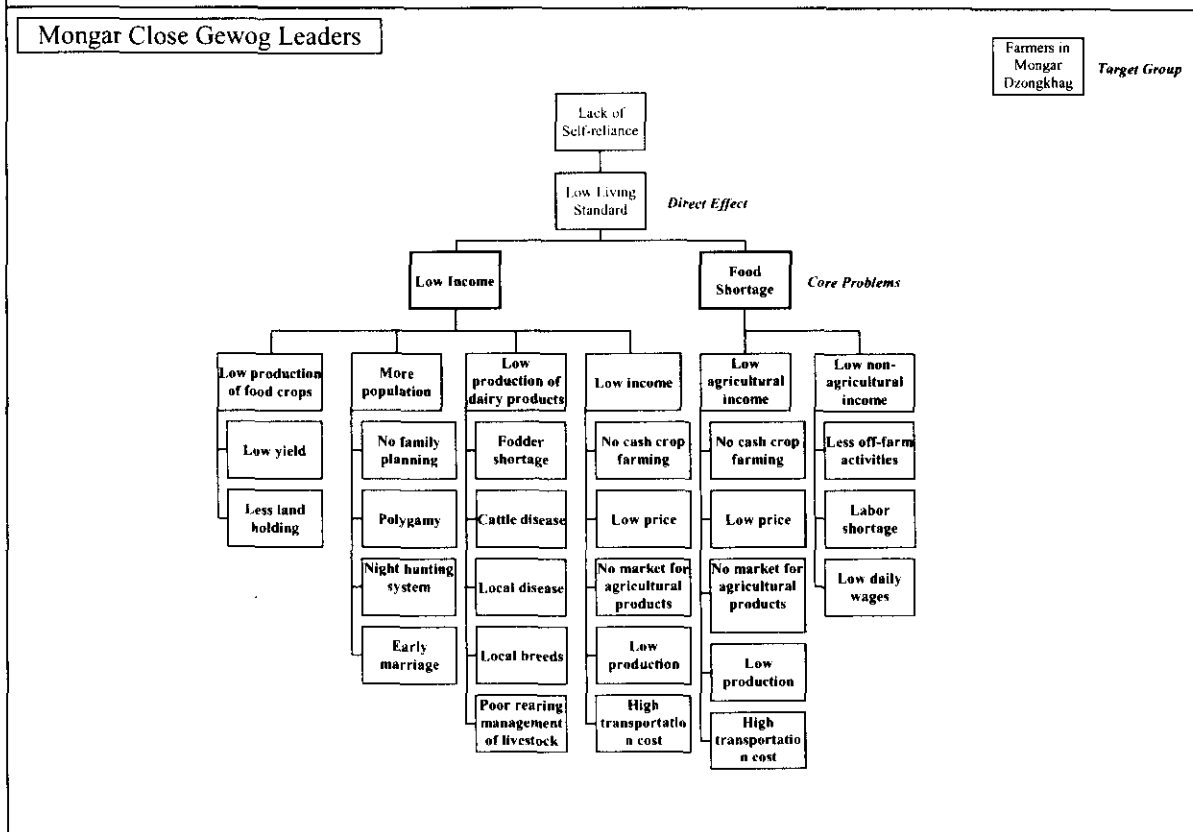
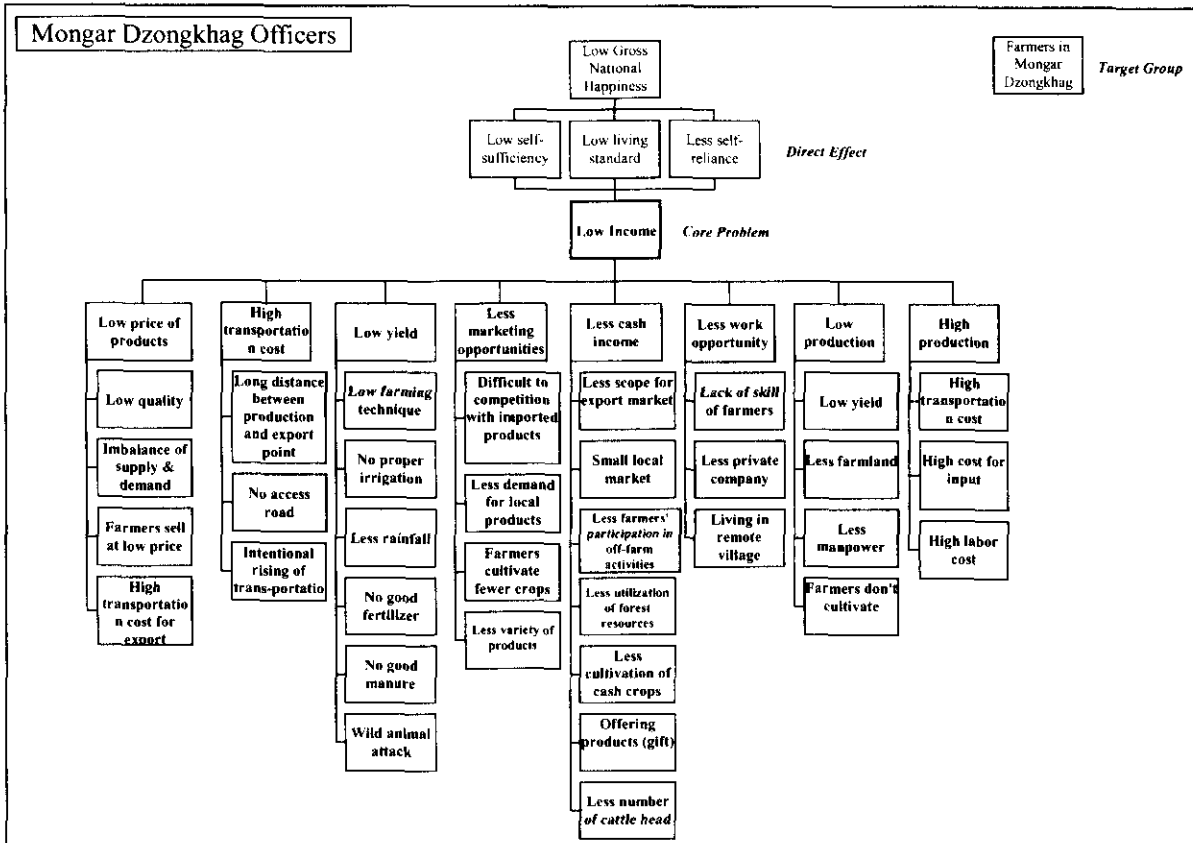
Figures



The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Figure VIII-1
Problem Tree in Lhuntse Dzongkhag

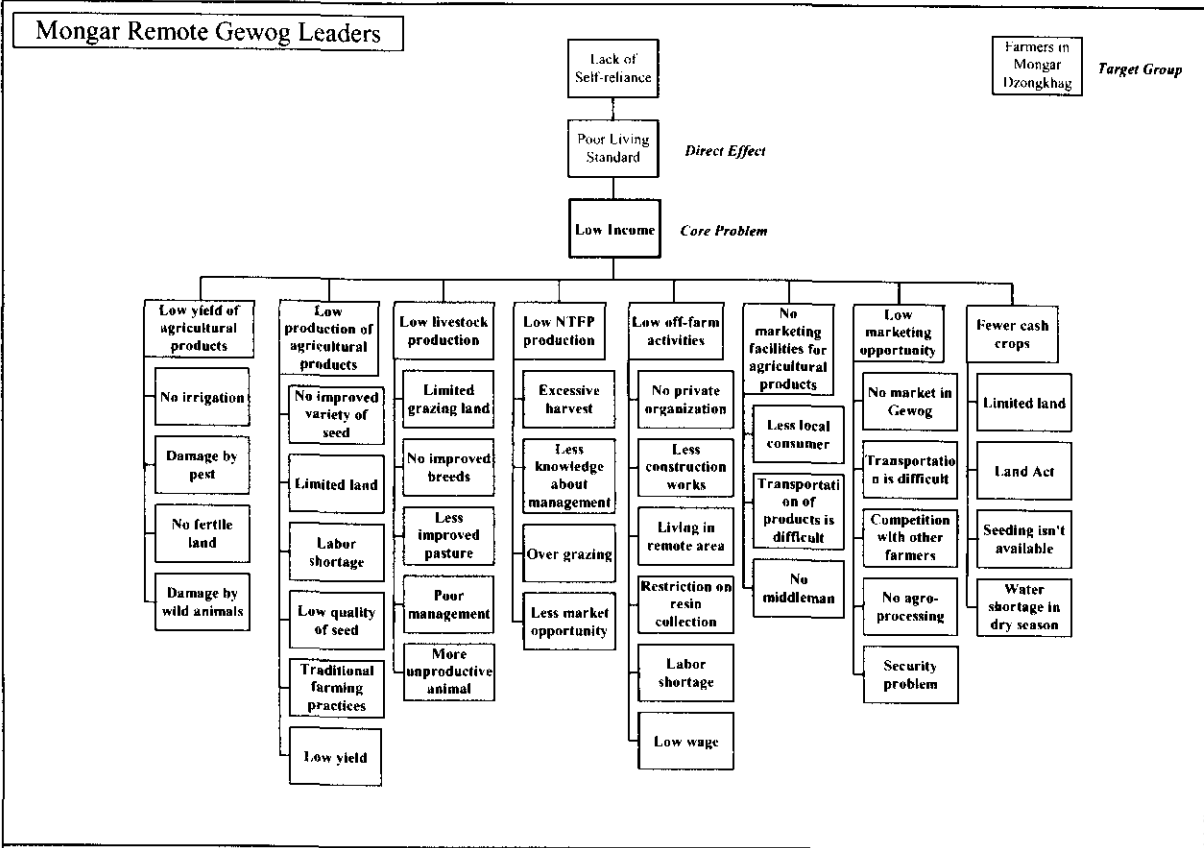
Japan International Cooperation Agency (JICA)



The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

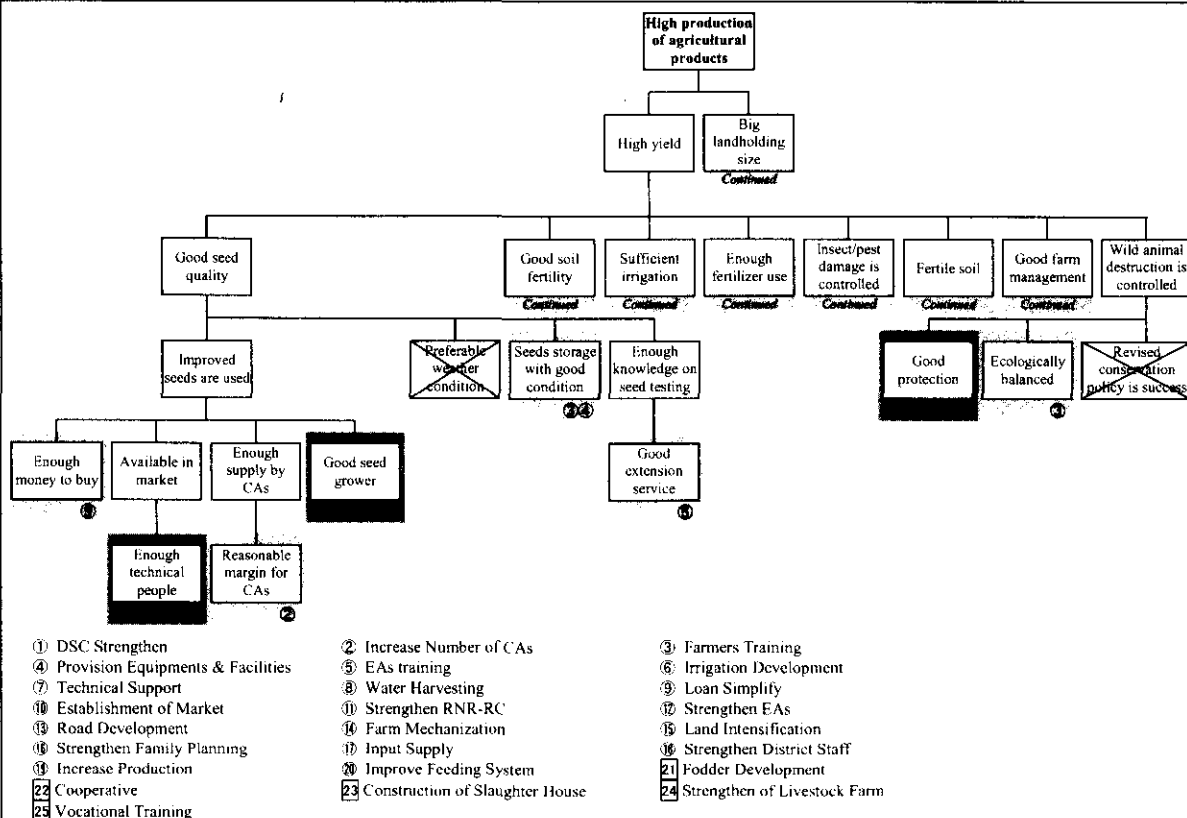
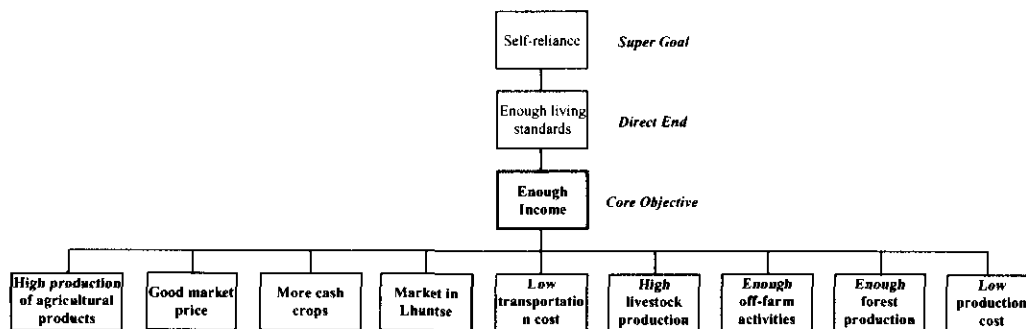
Figure VIII-2 (1/2)
Problem Tree in Mongar Dzongkhag



The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

Figure VIII-2 (2/2)
Problem Tree in Mongar Dzongkhag

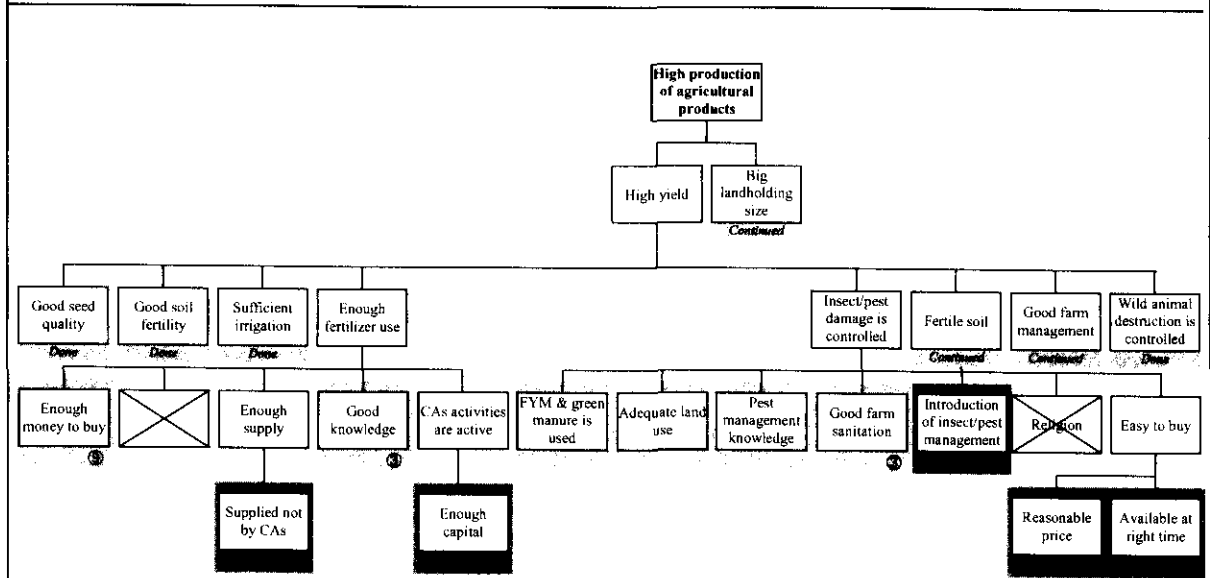
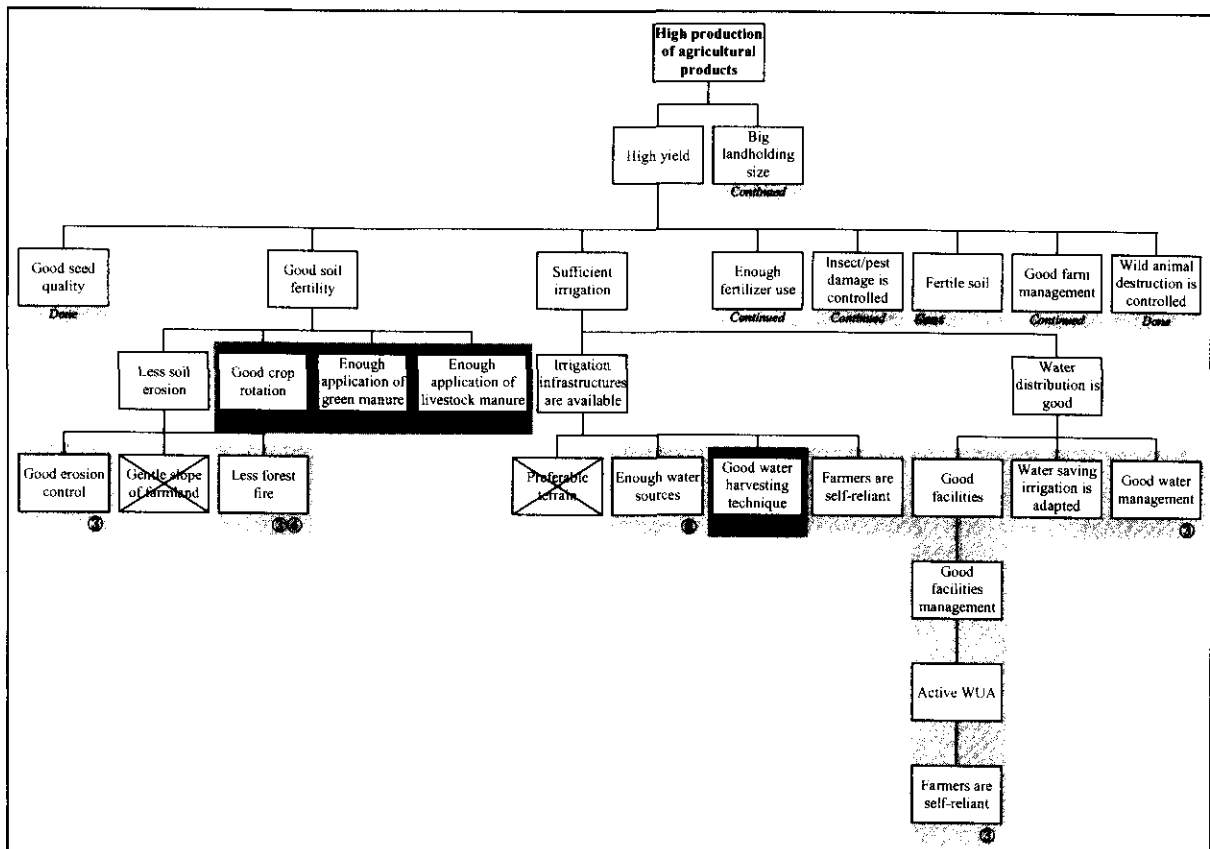


The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

Figure VIII-3 (1/6)

Selected Approaches with Objective Tree in Lhuntse Dzongkhag Summarized by Dongkhag Officers



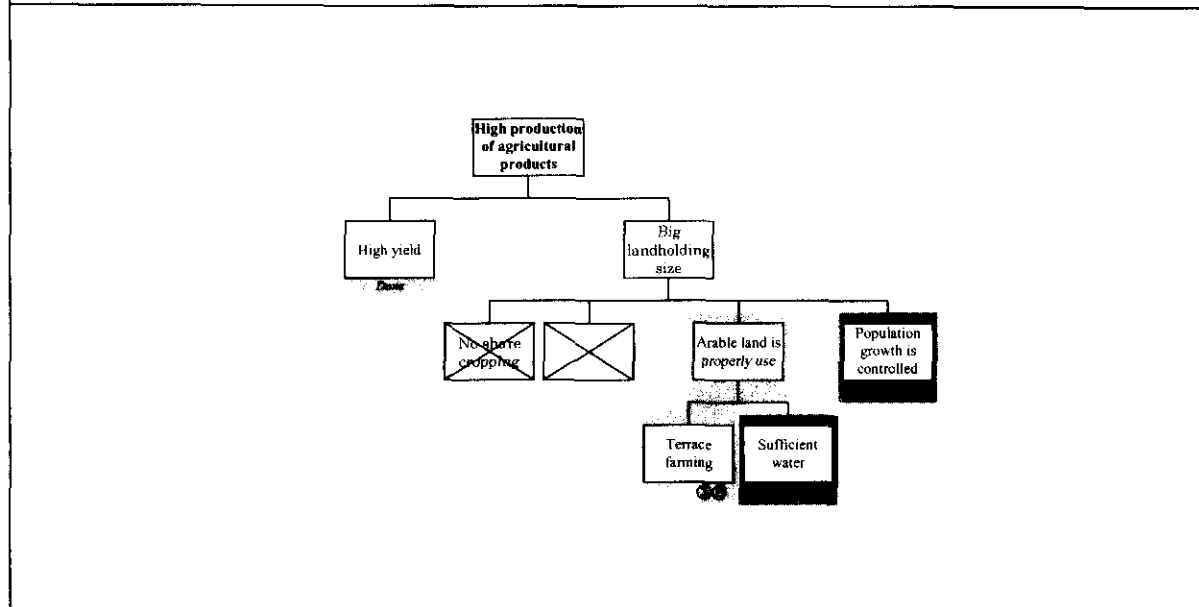
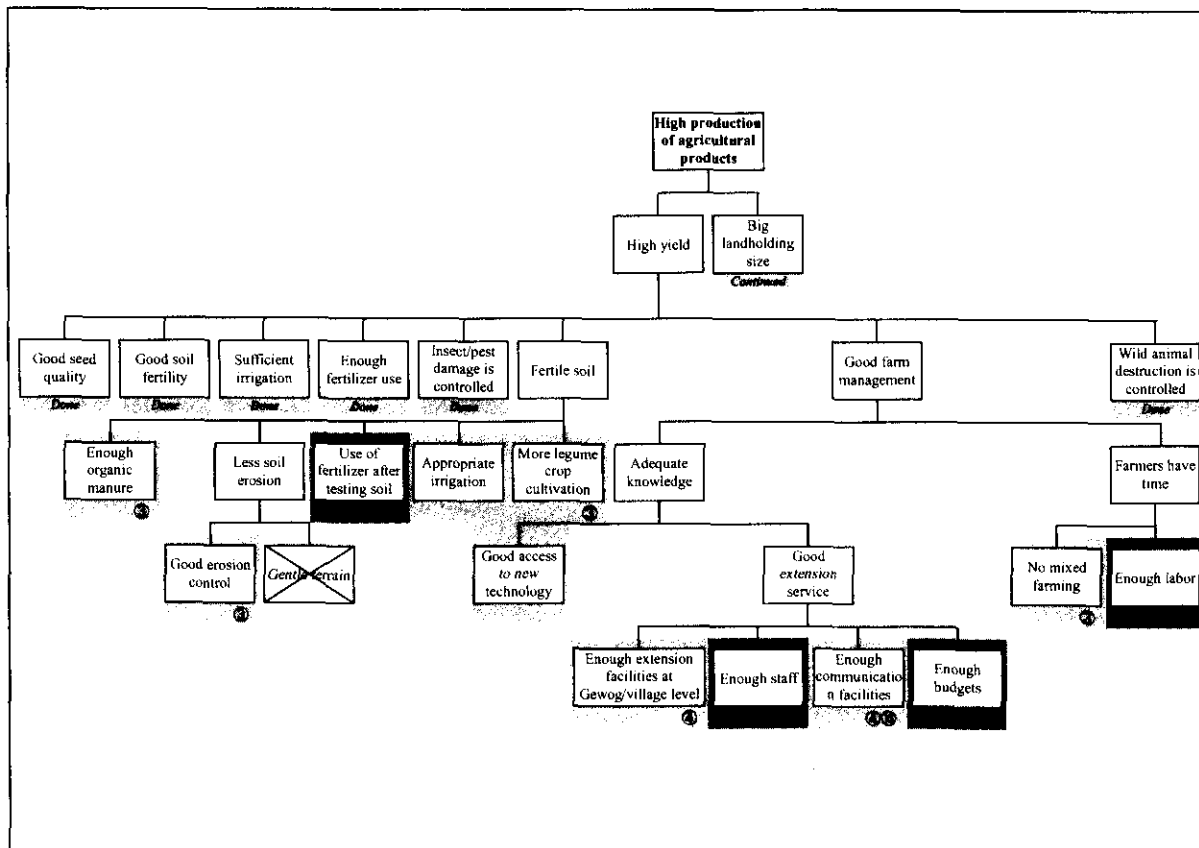
- ① DSC Strengthen
- ② Increase Number of CAs
- ③ Farmers Training
- ④ Provision Equipments & Facilities
- ⑤ EAs training
- ⑥ Irrigation Development
- ⑦ Technical Support
- ⑧ Water Harvesting
- ⑦ Loan Simplify
- ⑩ Establishment of Market
- ⑩ Strengthen RNR-RC
- ⑩ Strengthen EAs
- ⑬ Road Development
- ⑬ Farm Mechanization
- ⑬ Land Intensification
- ⑭ Strengthen Family Planning
- ⑭ Input Supply
- ⑭ Strengthen District Staff
- ⑮ Increase Production
- ⑮ Improve Feeding System
- ⑮ Fodder Development
- ⑰ Cooperative
- ⑰ Construction of Slaughter House
- ⑰ Strengthen of Livestock Farm
- ⑱ Vocational Training

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

Figure VIII-3 (2/6)

Selected Approaches with Objective Tree in Lhuntse Dzongkhag Summarized by Dzongkhag Officers

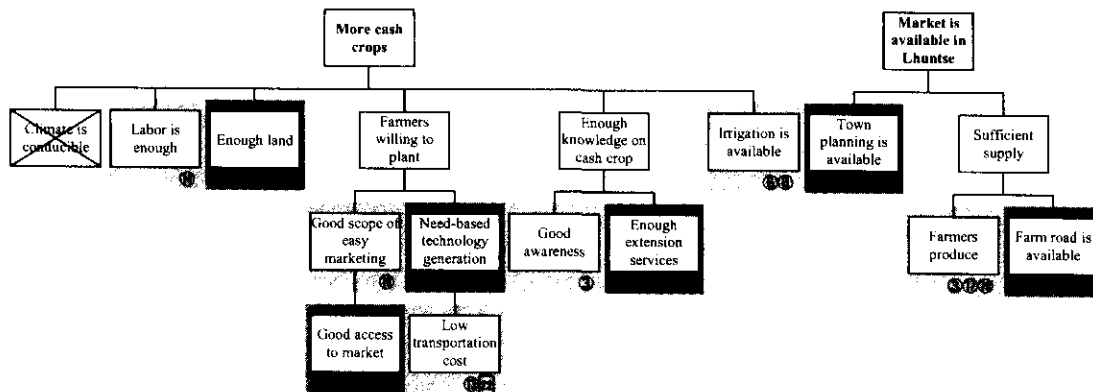
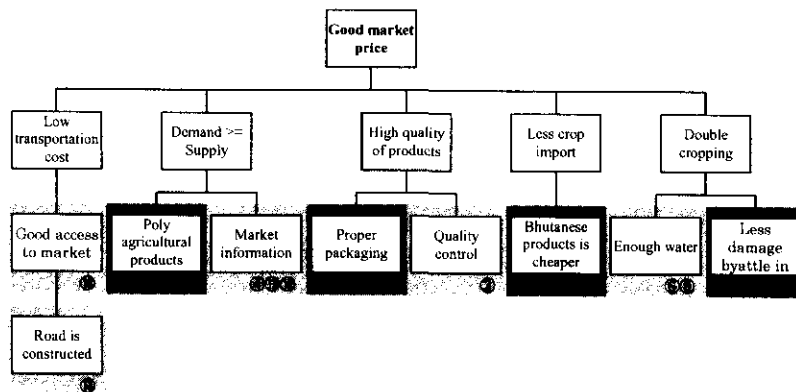


- | | | |
|-------------------------------------|-----------------------------------|--------------------------------|
| ① DSC Strengthen | ② Increase Number of CAs | ③ Farmers Training |
| ④ Provision Equipments & Facilities | ⑤ EAs training | ⑥ Irrigation Development |
| ⑦ Technical Support | ⑧ Water Harvesting | ⑦ Loan Simplify |
| ⑧ Establishment of Market | ⑨ Strengthen RNR-RC | ⑧ Strengthen EAs |
| ⑨ Road Development | ⑩ Farm Mechanization | ⑨ Land Intensification |
| ⑩ Strengthen Family Planning | ⑪ Input Supply | ⑩ Strengthen District Staff |
| ⑪ Increase Production | ⑫ Improve Feeding System | ⑪ Fodder Development |
| ⑫ Cooperative | ⑬ Construction of Slaughter House | ⑫ Strengthen of Livestock Farm |
| ⑬ Vocational Training | | |

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

Figure VIII-3 (3/6)
Selected Approaches with Objective Tree in Lhuntse Dzongkhag Summarized by Dzongkhag Officers



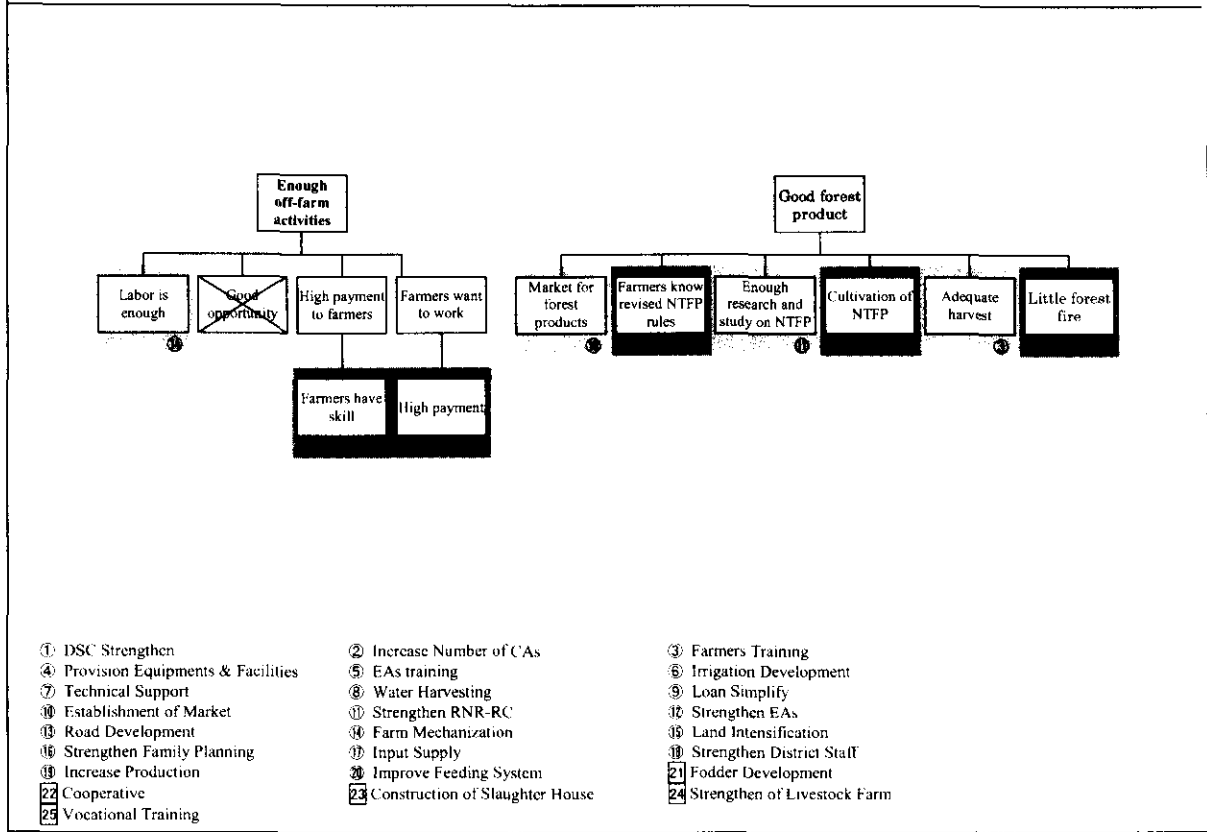
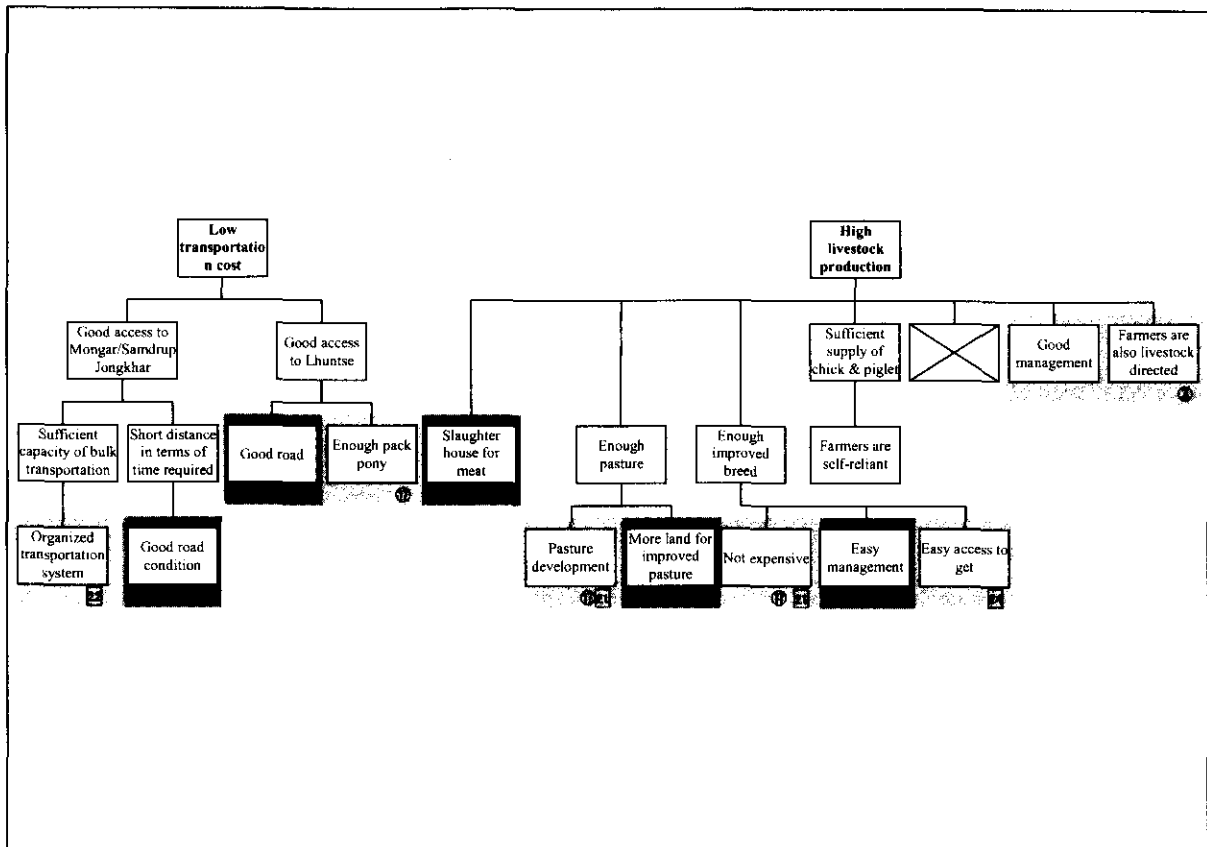
- | | | |
|-------------------------------------|-----------------------------------|--------------------------------|
| ① DSC Strengthen | ② Increase Number of CAs | ③ Farmers Training |
| ④ Provision Equipments & Facilities | ⑤ EAs training | ⑥ Irrigation Development |
| ⑦ Technical Support | ⑧ Water Harvesting | ⑦ Loan Simplify |
| ⑩ Establishment of Market | ⑩ Strengthen RNR-RC | ⑧ Strengthen EAs |
| ⑬ Road Development | ⑪ Farm Mechanization | ⑨ Land Intensification |
| ⑮ Strengthen Family Planning | ⑫ Input Supply | ⑩ Strengthen District Staff |
| ⑰ Increase Production | ⑬ Improve Feeding System | ⑪ Fodder Development |
| ⑲ Cooperative | ⑭ Construction of Slaughter House | ⑫ Strengthen of Livestock Farm |
| ⑳ Vocational Training | | |

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

Figure VIII-3 (4/6)

Selected Approaches with Objective Tree in Lhuntse Dzongkhag Summarized by Dzongkhag Officers

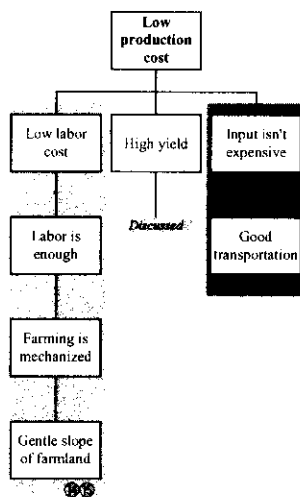


- ① DSC Strengthen
- ② Increase Number of CAs
- ③ Farmers Training
- ④ Provision Equipments & Facilities
- ⑤ EAs training
- ⑥ Irrigation Development
- ⑦ Technical Support
- ⑧ Water Harvesting
- ⑨ Loan Simplify
- ⑩ Establishment of Market
- ⑪ Strengthen RNR-RC
- ⑫ Strengthen EAs
- ⑬ Road Development
- ⑭ Farm Mechanization
- ⑮ Land Intensification
- ⑯ Strengthen Family Planning
- ⑰ Input Supply
- ⑱ Strengthen District Staff
- ⑲ Increase Production
- ⑳ Improve Feeding System
- ㉑ Fodder Development
- ㉒ Cooperative
- ㉓ Construction of Slaughter House
- ㉔ Strengthen of Livestock Farm
- ㉕ Vocational Training

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

Figure VIII-3 (5/6)
Selected Approaches with Objective Tree in Lhuntse Dzongkhag Summarized by Dzongkhag Officers



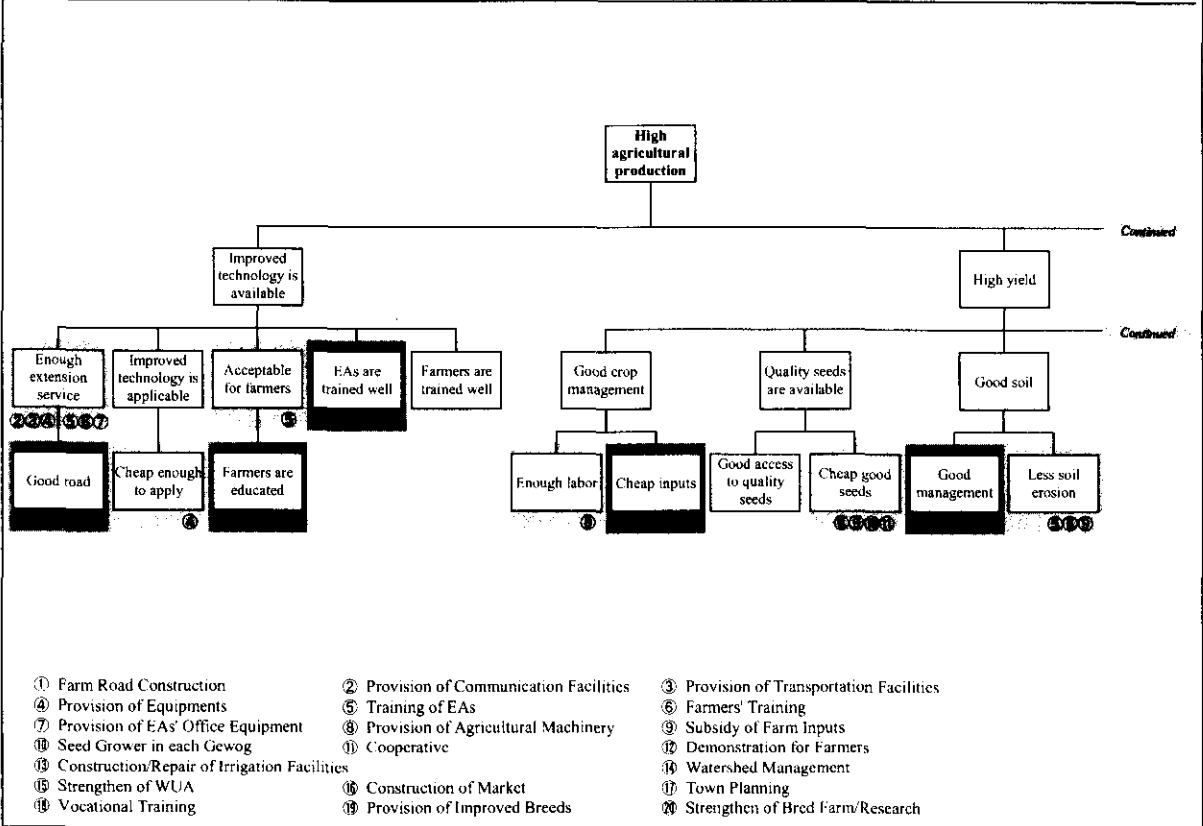
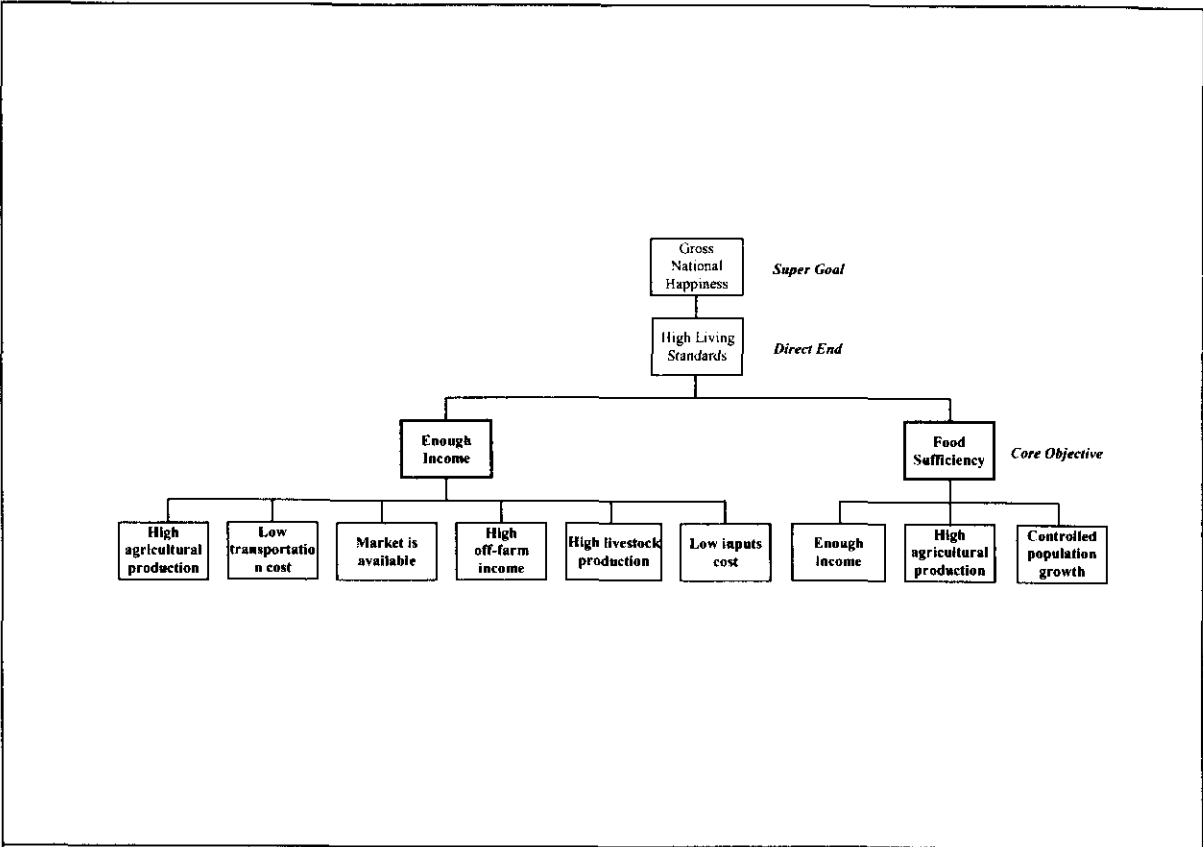
- | | | |
|-------------------------------------|-----------------------------------|--------------------------------|
| ① DSC Strengthen | ② Increase Number of CAs | ③ Farmers Training |
| ④ Provision Equipments & Facilities | ⑤ EAs training | ⑥ Irrigation Development |
| ⑦ Technical Support | ⑧ Water Harvesting | ⑨ Loan Simplify |
| ⑩ Establishment of Market | ⑪ Strengthen RNR-RC | ⑫ Strengthen EAs |
| ⑬ Road Development | ⑭ Farm Mechanization | ⑮ Land Intensification |
| ⑯ Strengthen Family Planning | ⑰ Input Supply | ⑱ Strengthen District Staff |
| ⑲ Increase Production | ⑳ Improve Feeding System | ㉑ Fodder Development |
| ㉒ Cooperative | ㉓ Construction of Slaughter House | ㉔ Strengthen of Livestock Farm |
| ㉕ Vocational Training | | |

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Figure VIII-3 (6/6)

Selected Approaches with Objective Tree in Lhuntse Dzongkhag Summarized by Dzongkhag Officers

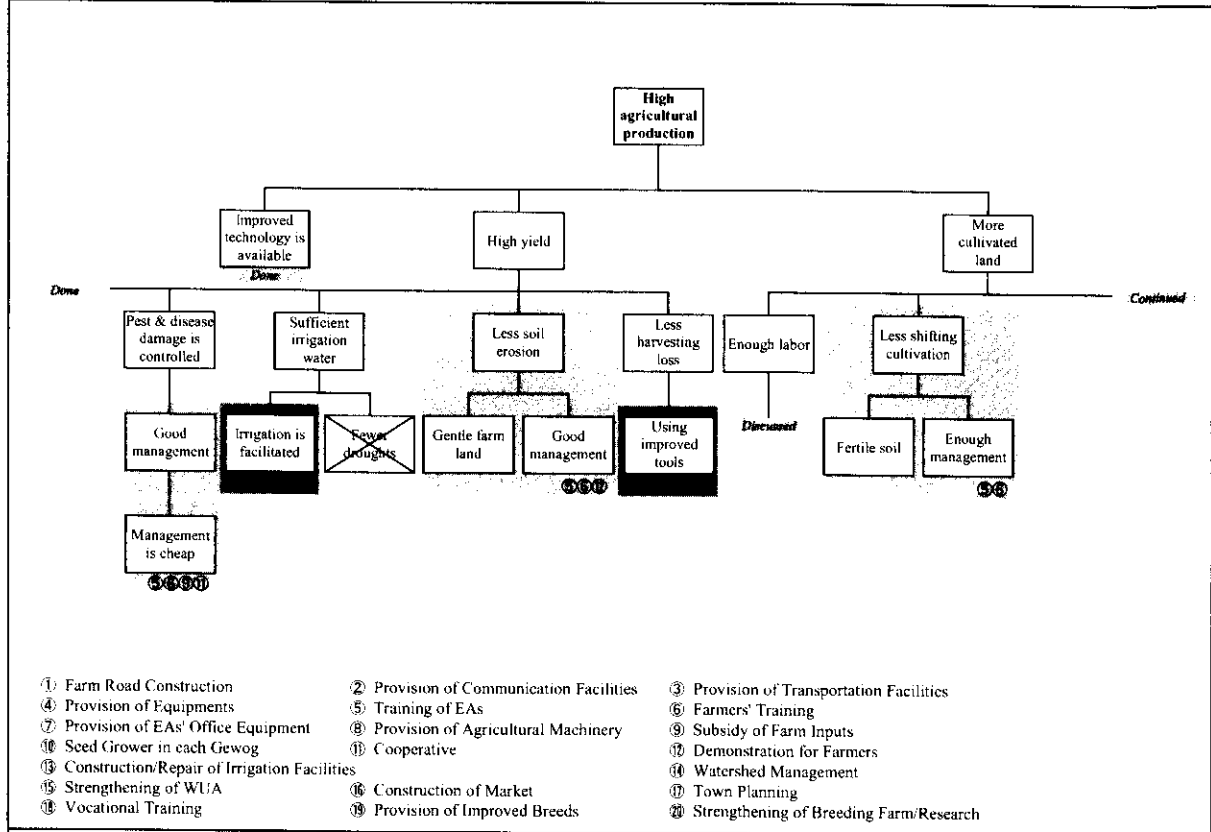
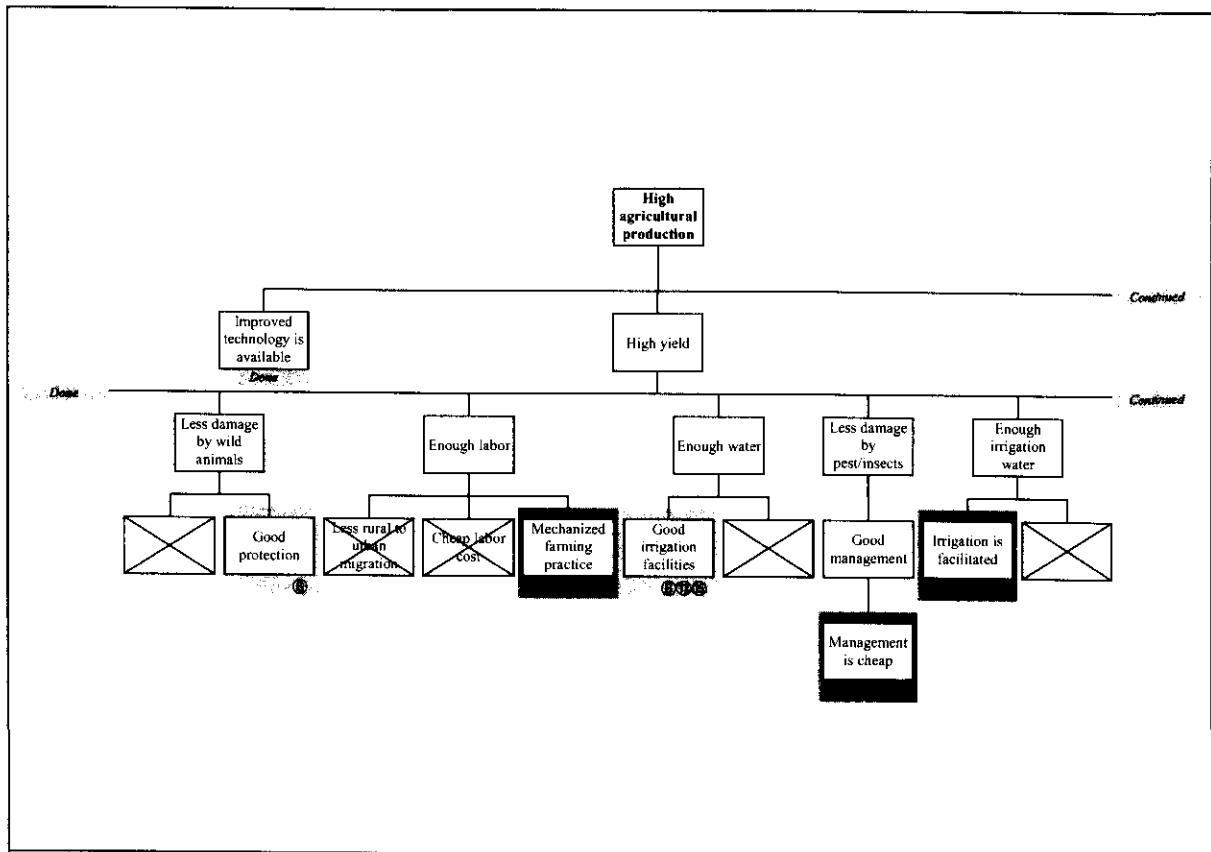
Japan International Cooperation Agency (JICA)



The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

Figure VIII-4 (1/4)
Selected Approaches with Objective Tree in Lhuntse Dzongkhag Summarized by Gewog Leaders

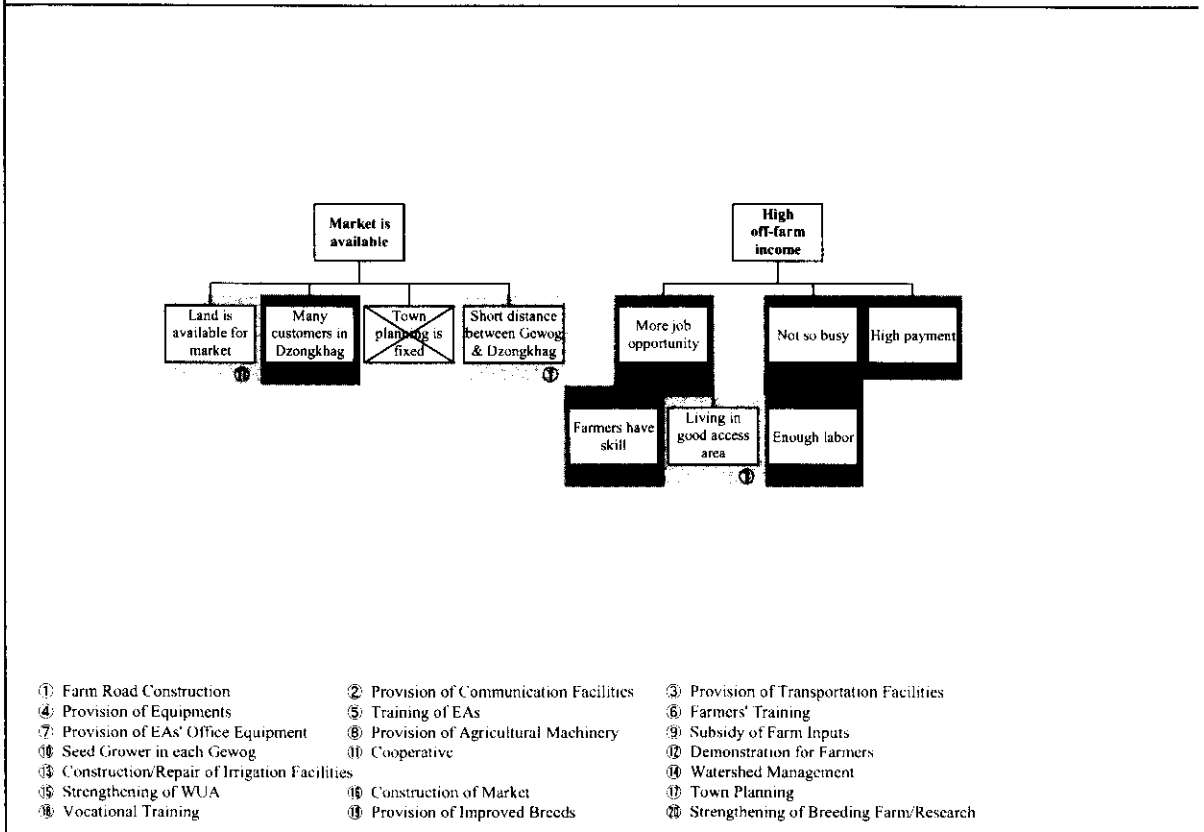
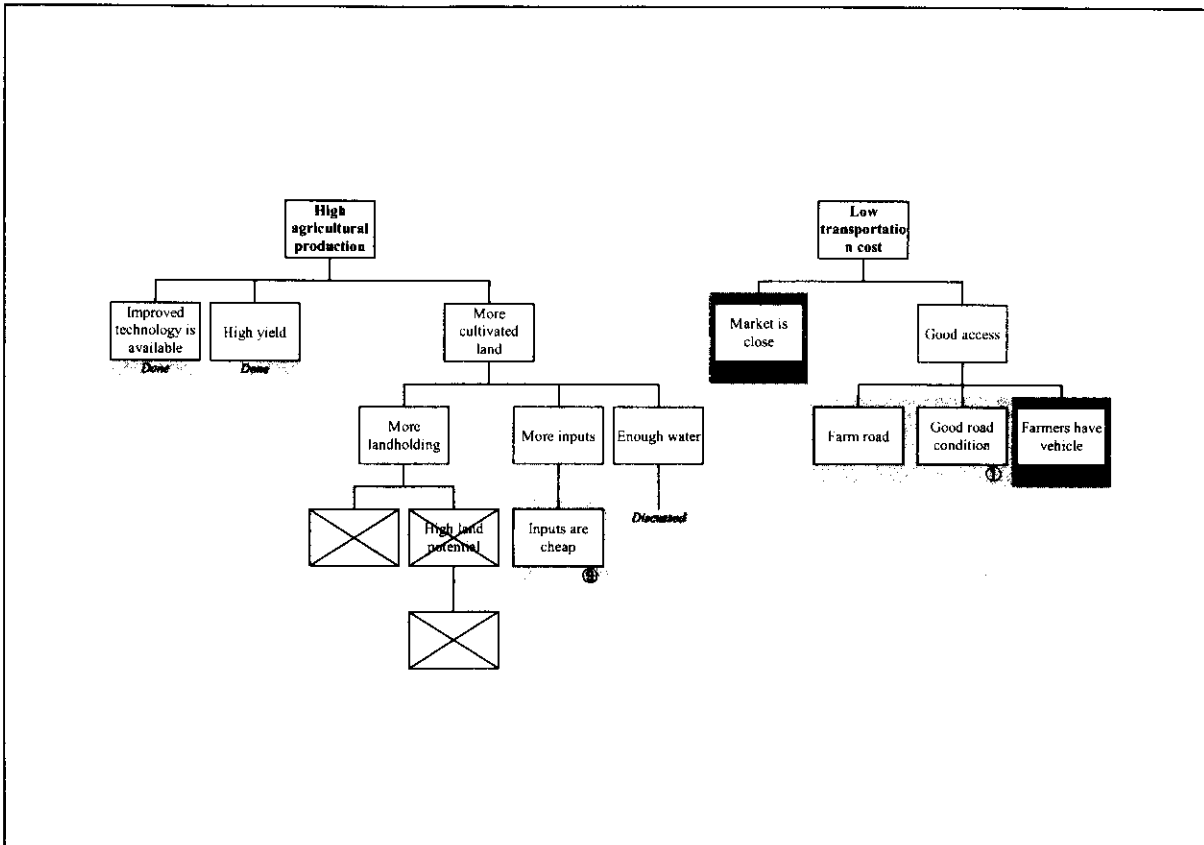


- | | | |
|--|---|---|
| ① Farm Road Construction | ② Provision of Communication Facilities | ③ Provision of Transportation Facilities |
| ④ Provision of Equipments | ⑤ Training of EAs | ⑥ Farmers' Training |
| ⑦ Provision of EAs' Office Equipment | ⑧ Provision of Agricultural Machinery | ⑨ Subsidy of Farm Inputs |
| ⑩ Seed Grower in each Gewog | ⑪ Cooperative | ⑫ Demonstration for Farmers |
| ⑬ Construction/Repair of Irrigation Facilities | ⑭ Construction of Market | ⑮ Watershed Management |
| ⑯ Strengthening of WUA | ⑰ Provision of Improved Breeds | ⑱ Town Planning |
| ⑲ Vocational Training | | ⑳ Strengthening of Breeding Farm/Research |

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

Figure VIII-4 (2/4)
Selected Approaches with Objective Tree in Lhuntse Dzongkhag Summarized by Gewog Leaders

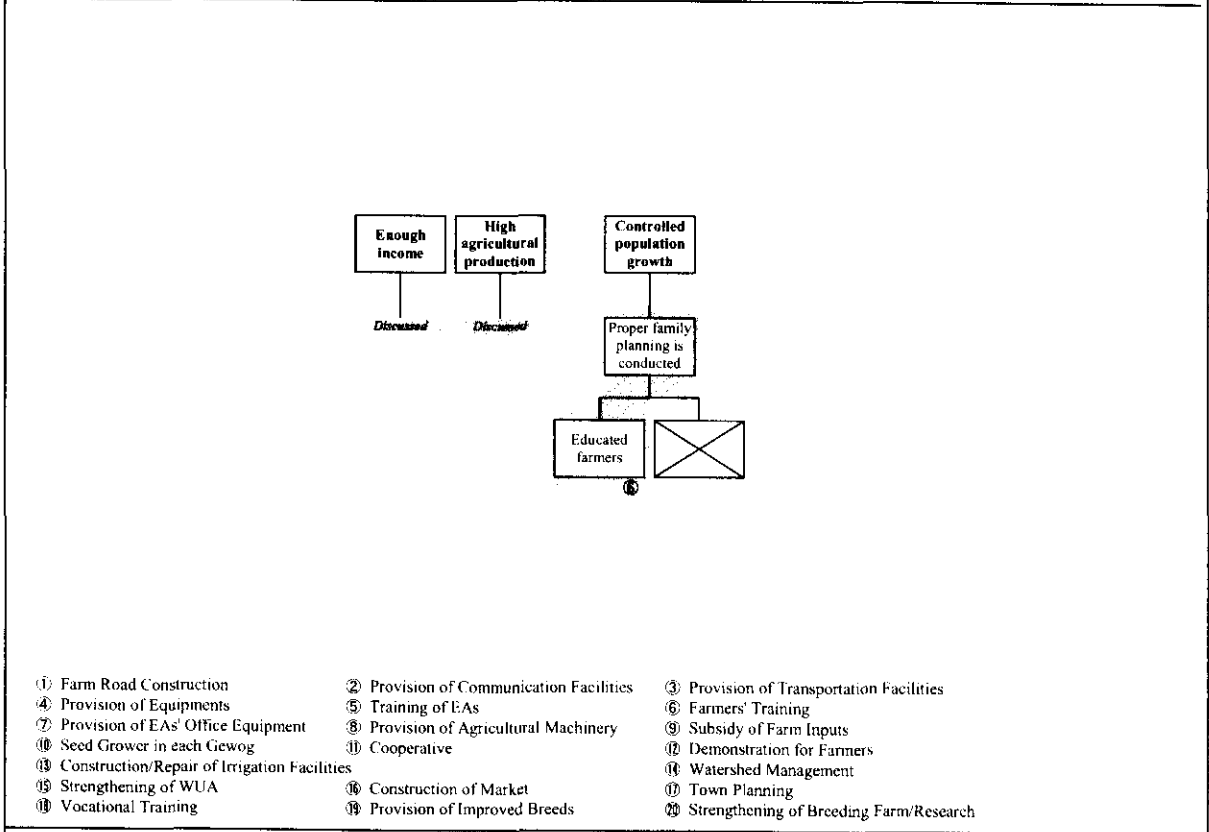
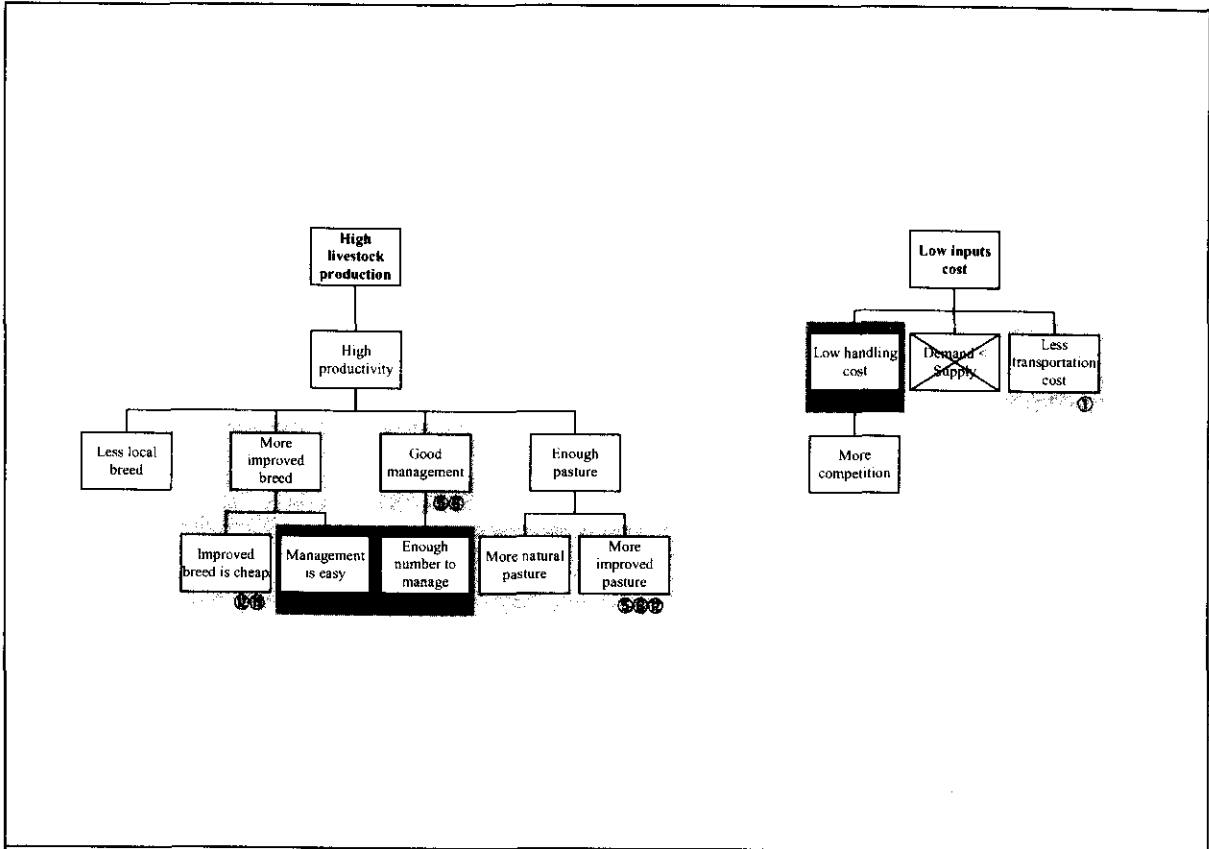


- ① Farm Road Construction
- ② Provision of Communication Facilities
- ③ Provision of Transportation Facilities
- ④ Provision of Equipments
- ⑤ Training of EAs
- ⑥ Farmers' Training
- ⑦ Provision of EAs' Office Equipment
- ⑧ Provision of Agricultural Machinery
- ⑨ Subsidy of Farm Inputs
- ⑩ Seed Grower in each Gewog
- ⑪ Cooperative
- ⑫ Demonstration for Farmers
- ⑬ Construction/Repair of Irrigation Facilities
- ⑭ Watershed Management
- ⑮ Strengthening of WUA
- ⑯ Construction of Market
- ⑰ Town Planning
- ⑱ Vocational Training
- ⑲ Provision of Improved Breeds
- ⑳ Strengthening of Breeding Farm/Research

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

**Figure VIII-4 (3/4)
Selected Approaches with Objective Tree in Lhuntse Dzongkhag Summarized by Gewog Leaders**

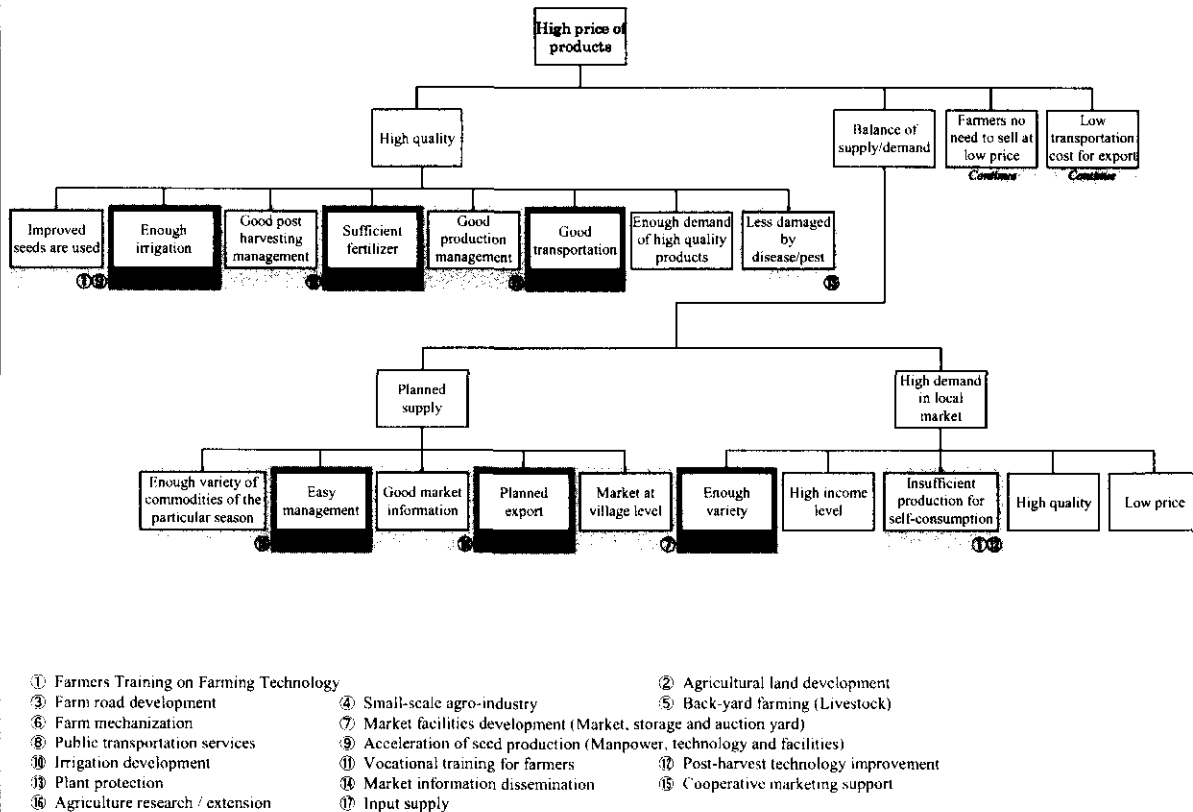
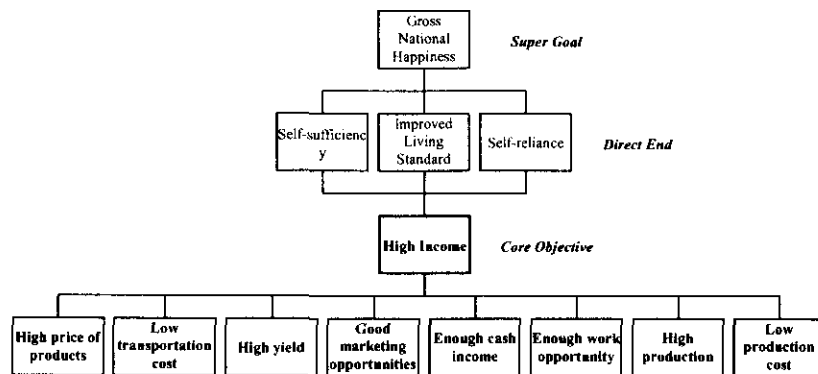


- ① Farm Road Construction
- ② Provision of Communication Facilities
- ③ Provision of Transportation Facilities
- ④ Provision of Equipments
- ⑤ Training of EAs
- ⑥ Farmers' Training
- ⑦ Provision of EAs' Office Equipment
- ⑧ Provision of Agricultural Machinery
- ⑨ Subsidy of Farm Inputs
- ⑩ Seed Grower in each Gewog
- ⑪ Cooperative
- ⑫ Demonstration for Farmers
- ⑬ Construction/Repair of Irrigation Facilities
- ⑭ Watershed Management
- ⑮ Strengthening of WUA
- ⑯ Construction of Market
- ⑰ Town Planning
- ⑱ Vocational Training
- ⑲ Provision of Improved Breeds
- ⑳ Strengthening of Breeding Farm/Research

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

Figure VIII-4 (4/4)
Selected Approaches with Objective Tree in Lhuntse Dzongkhag Summarized by Gewog Leaders

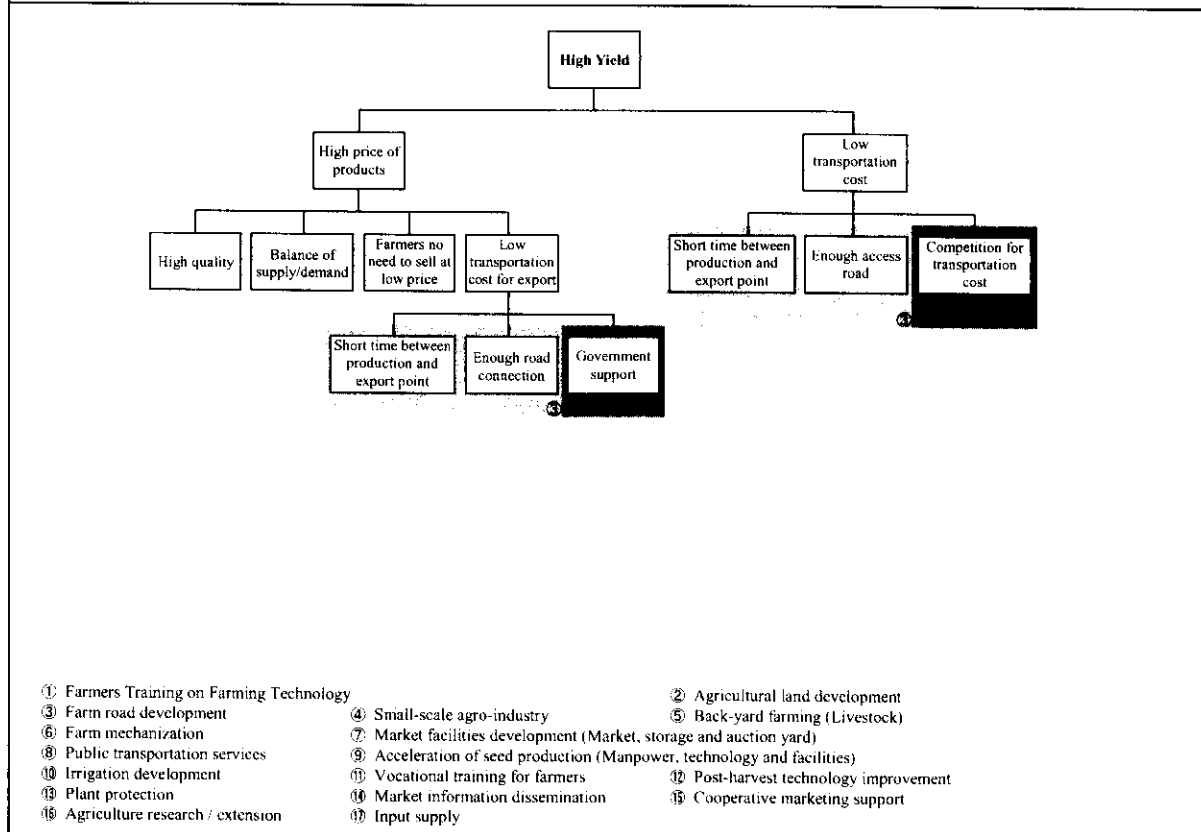
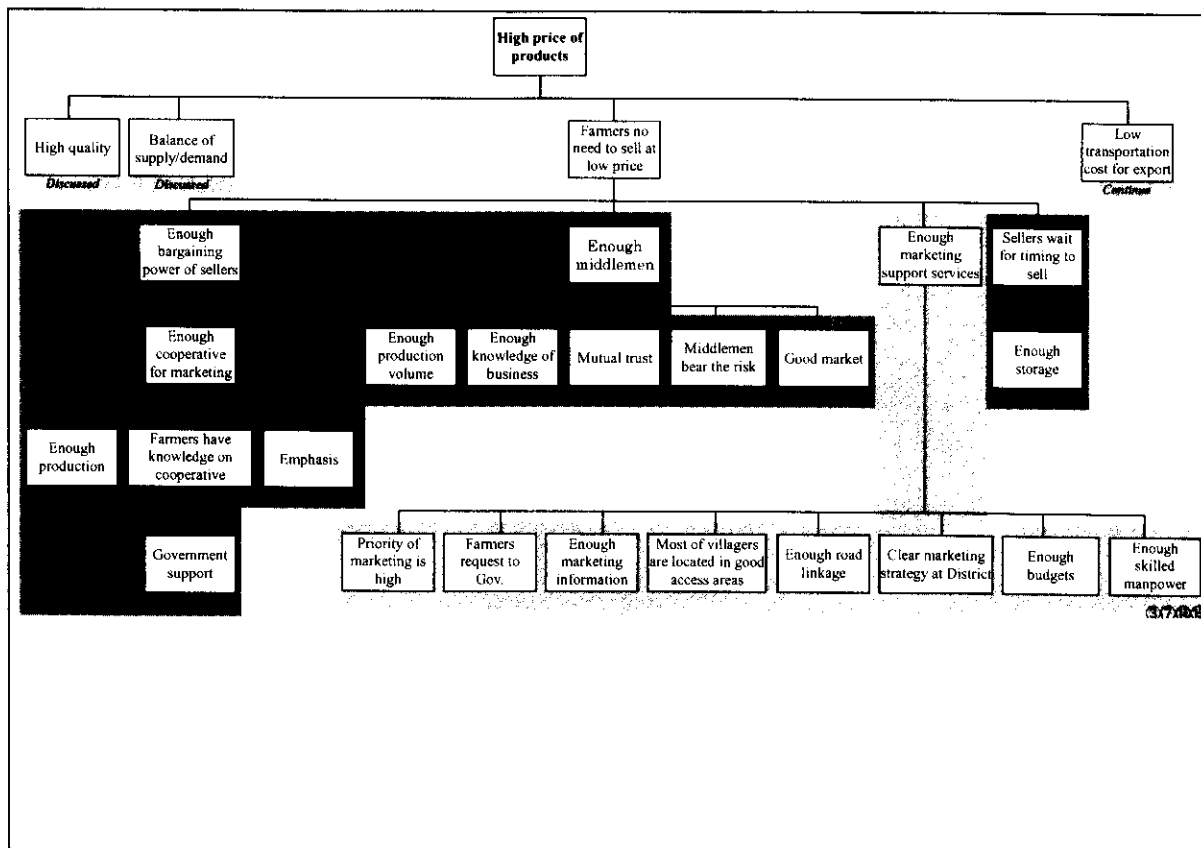


The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

Figure VIII-5 (1/5)

Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Dzongkhag Officers

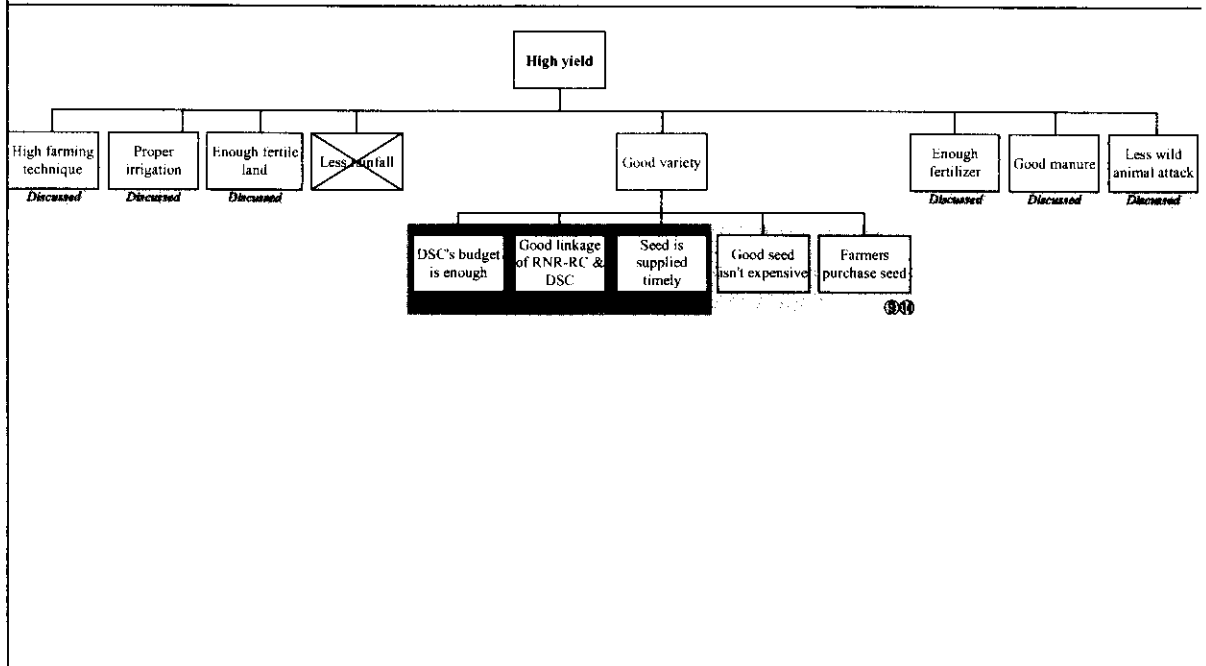
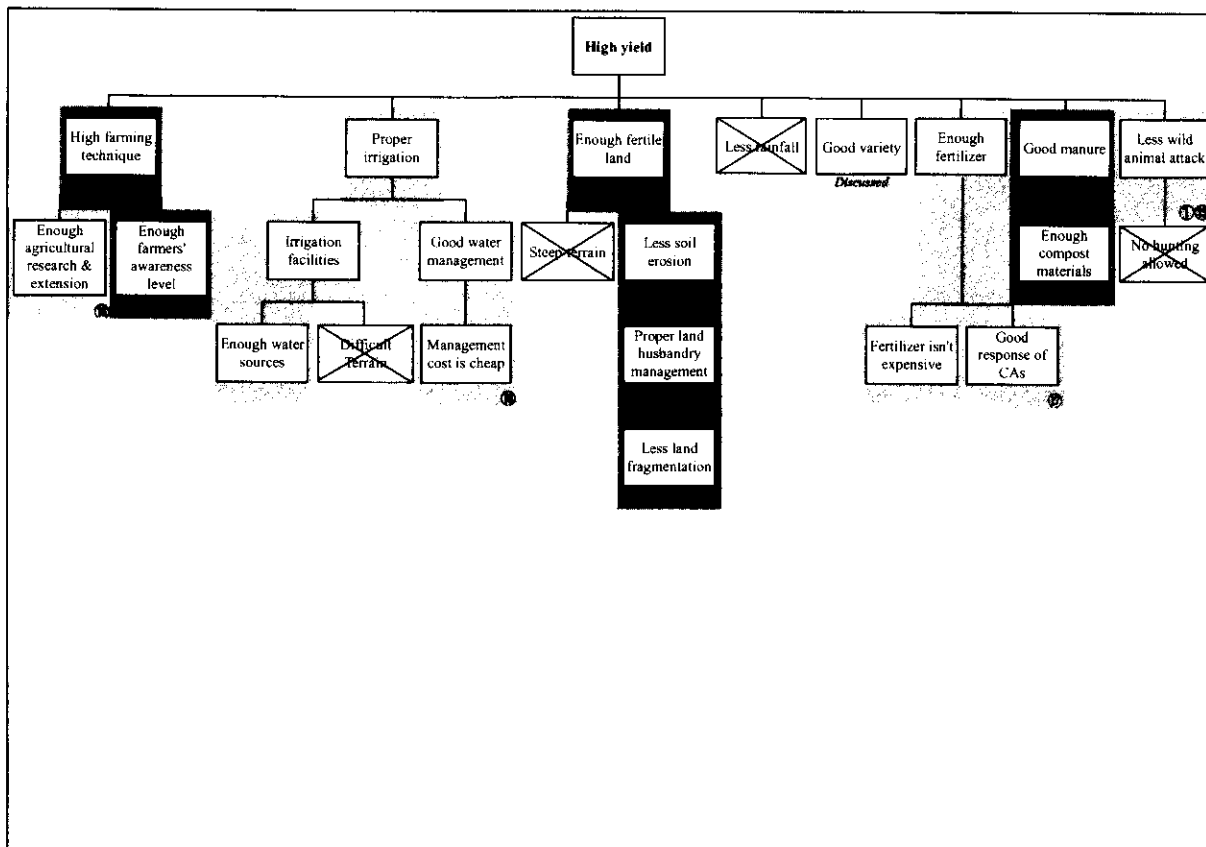


- ① Farmers Training on Farming Technology
- ② Agricultural land development
- ③ Farm road development
- ④ Small-scale agro-industry
- ⑤ Back-yard farming (Livestock)
- ⑥ Farm mechanization
- ⑦ Market facilities development (Market, storage and auction yard)
- ⑧ Public transportation services
- ⑨ Acceleration of seed production (Manpower, technology and facilities)
- ⑩ Irrigation development
- ⑪ Vocational training for farmers
- ⑫ Post-harvest technology improvement
- ⑬ Plant protection
- ⑭ Market information dissemination
- ⑮ Cooperative marketing support
- ⑯ Agriculture research / extension
- ⑰ Input supply

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

**Figure VIII-5 (2/5)
Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Dzongkhag Officers**

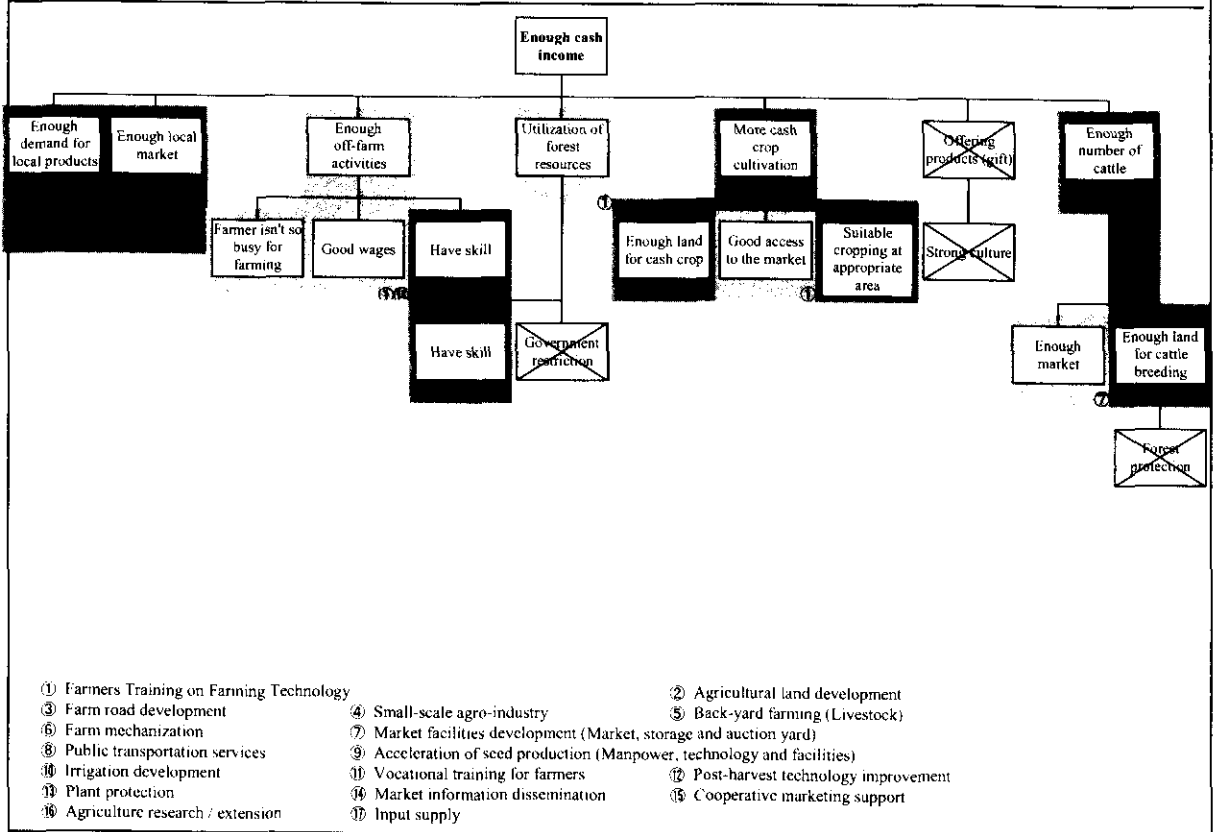
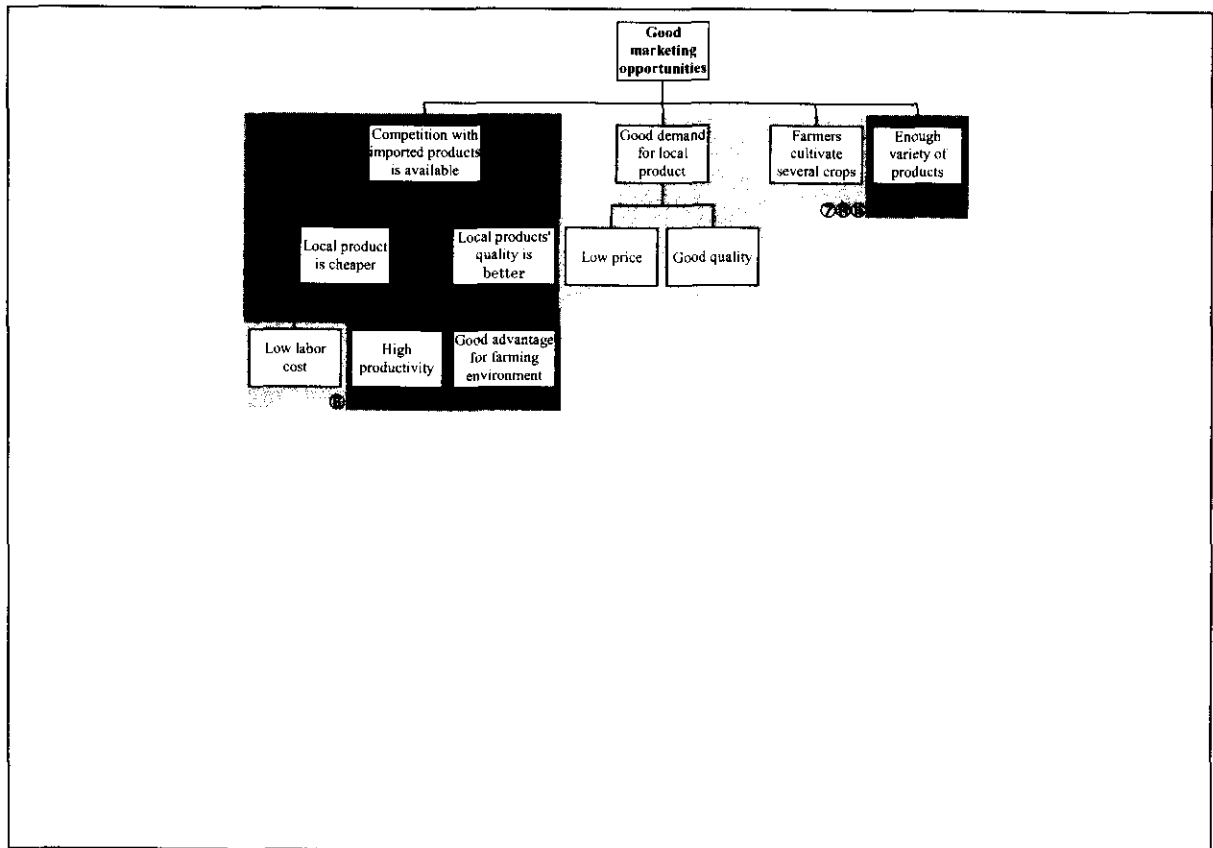


- ① Farmers Training on Farming Technology
- ② Agricultural land development
- ③ Farm road development
- ④ Small-scale agro-industry
- ⑤ Back-yard farming (Livestock)
- ⑥ Farm mechanization
- ⑦ Market facilities development (Market, storage and auction yard)
- ⑧ Public transportation services
- ⑨ Acceleration of seed production (Manpower, technology and facilities)
- ⑩ Irrigation development
- ⑪ Vocational training for farmers
- ⑫ Post-harvest technology improvement
- ⑬ Plant protection
- ⑭ Market information dissemination
- ⑮ Cooperative marketing support
- ⑯ Agriculture research / extension
- ⑰ Input supply

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

**Figure VIII-5 (3/5)
Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Dzongkhag Officers**

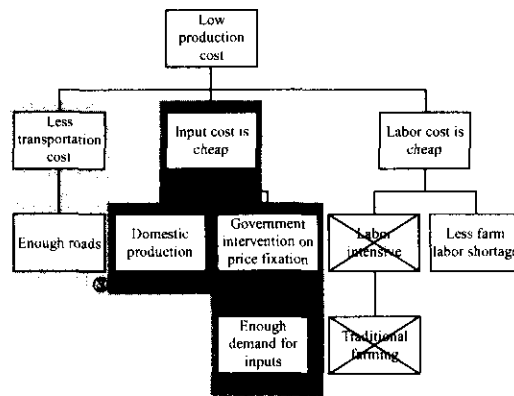
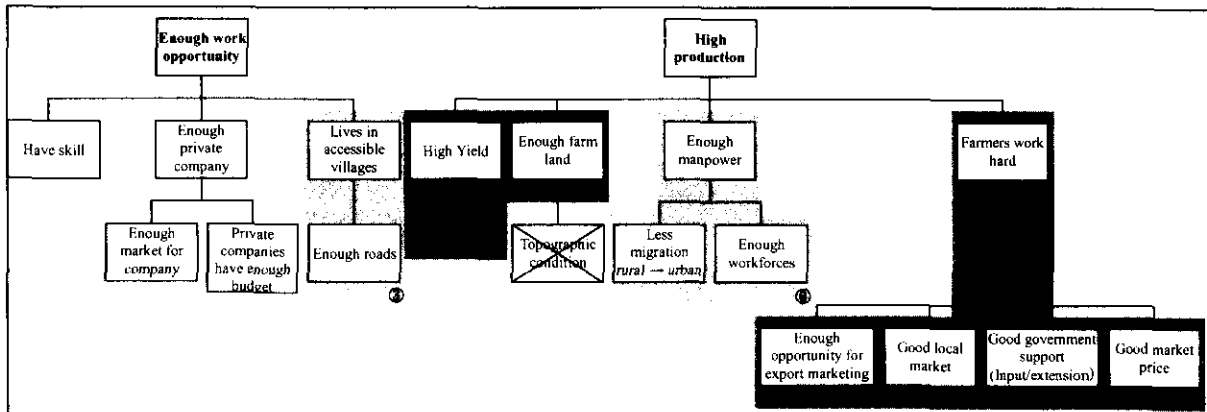


- ① Farmers Training on Farming Technology
- ② Agricultural land development
- ③ Farm road development
- ③ Small-scale agro-industry
- ④ Farm mechanization
- ④ Market facilities development (Market, storage and auction yard)
- ⑤ Public transportation services
- ⑤ Acceleration of seed production (Manpower, technology and facilities)
- ⑥ Irrigation development
- ⑥ Vocational training for farmers
- ⑦ Plant protection
- ⑦ Market information dissemination
- ⑧ Agriculture research / extension
- ⑧ Input supply
- ⑨ Back-yard farming (Livestock)
- ⑩ Post-harvest technology improvement
- ⑪ Cooperative marketing support

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

**Figure VIII-5 (4/5)
Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Dzongkhag Officers**

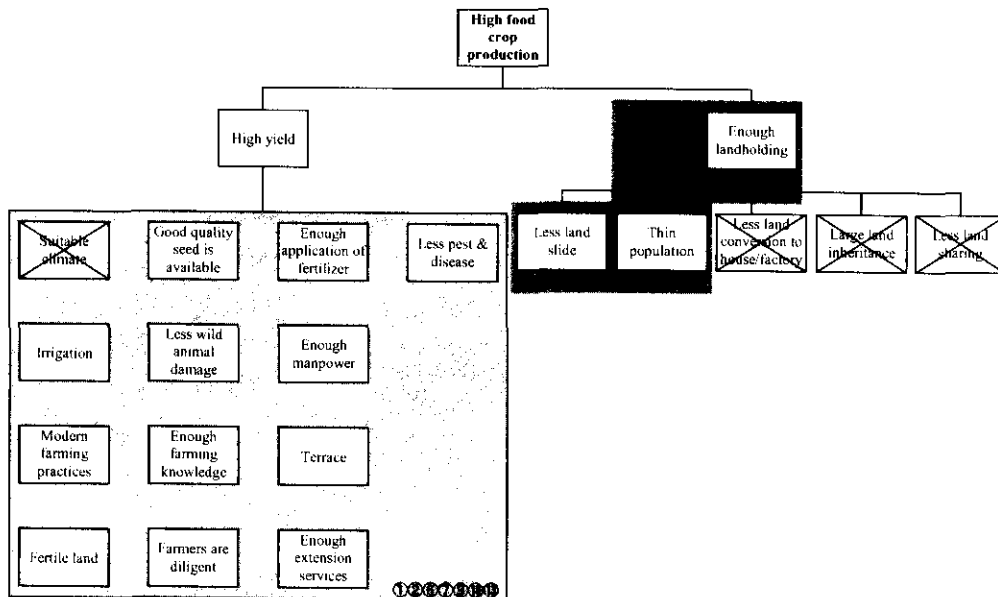
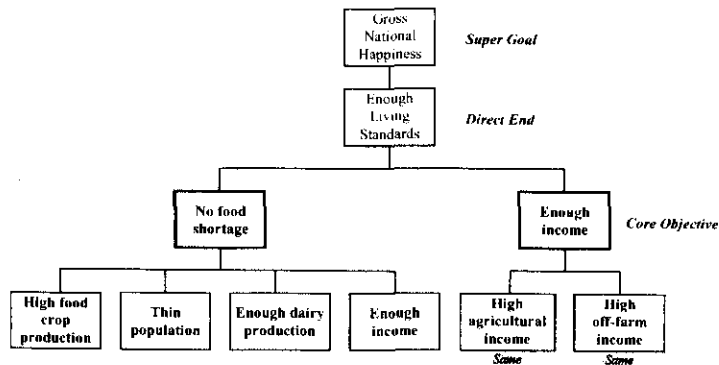


- ① Farmers Training on Farming Technology
- ② Agricultural land development
- ③ Farm road development
- ④ Small-scale agro-industry
- ⑤ Back-yard farming (Livestock)
- ⑥ Farm mechanization
- ⑦ Market facilities development (Market, storage and auction yard)
- ⑧ Public transportation services
- ⑨ Acceleration of seed production (Manpower, technology and facilities)
- ⑩ Irrigation development
- ⑪ Vocational training for farmers
- ⑫ Post-harvest technology improvement
- ⑬ Plant protection
- ⑭ Market information dissemination
- ⑮ Cooperative marketing support
- ⑯ Agriculture research / extension
- ⑰ Input supply

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

**Figure VIII-5 (5/5)
Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Dzongkhag Officers**

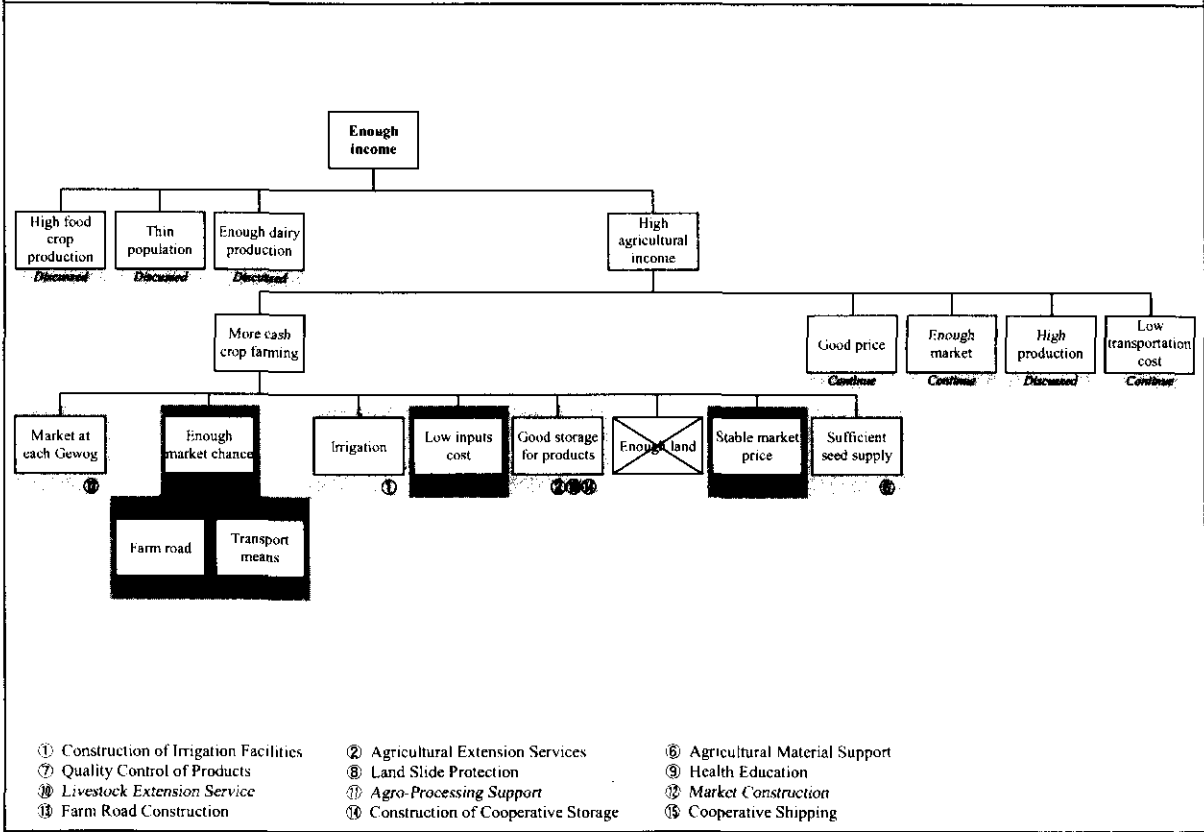
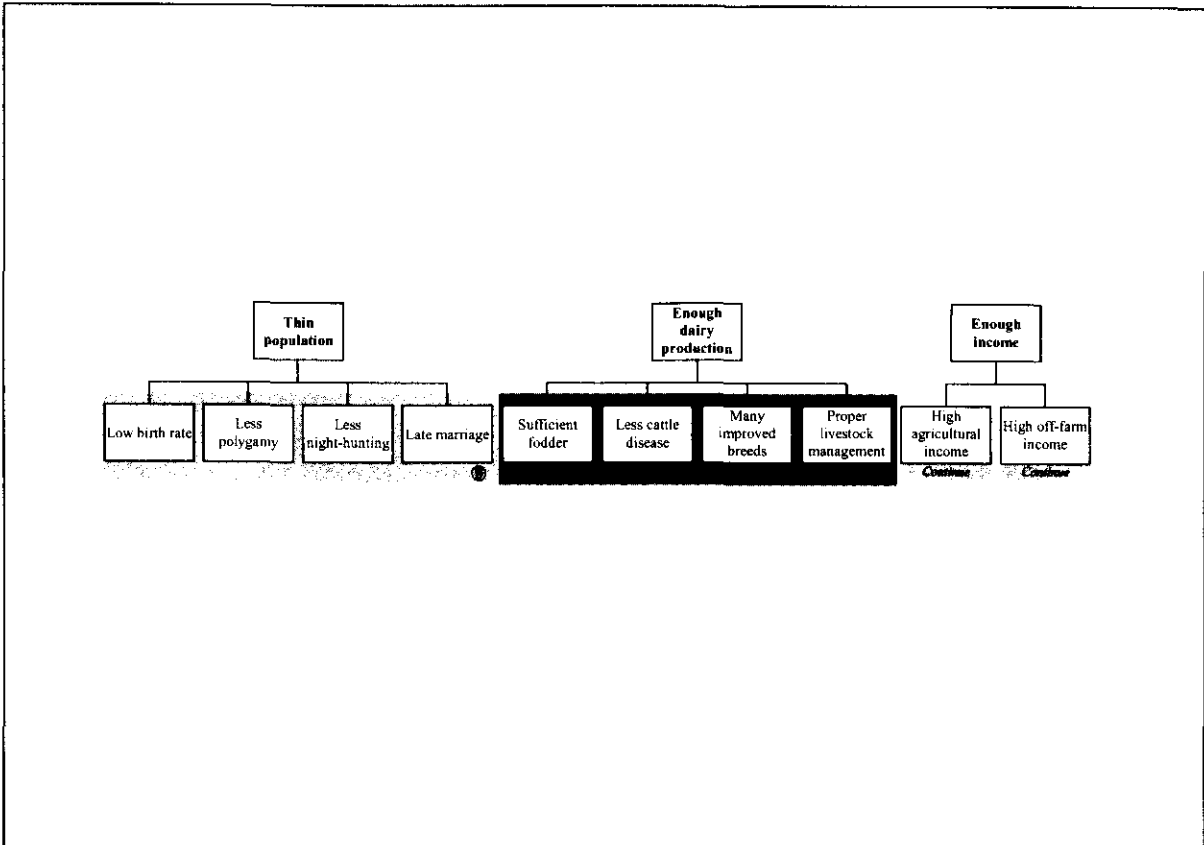


- ① Construction of Irrigation Facilities
- ② Agricultural Extension Services
- ③ Agricultural Material Support
- ④ Quality Control of Products
- ⑤ Land Slide Protection
- ⑥ Health Education
- ⑦ Livestock Extension Service
- ⑧ Agro-Processing Support
- ⑨ Market Construction
- ⑩ Farm Road Construction
- ⑪ Construction of Cooperative Storage
- ⑫ Cooperative Shipping

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

**Figure VIII-6 (1/4)
Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Close Gewog Leaders**

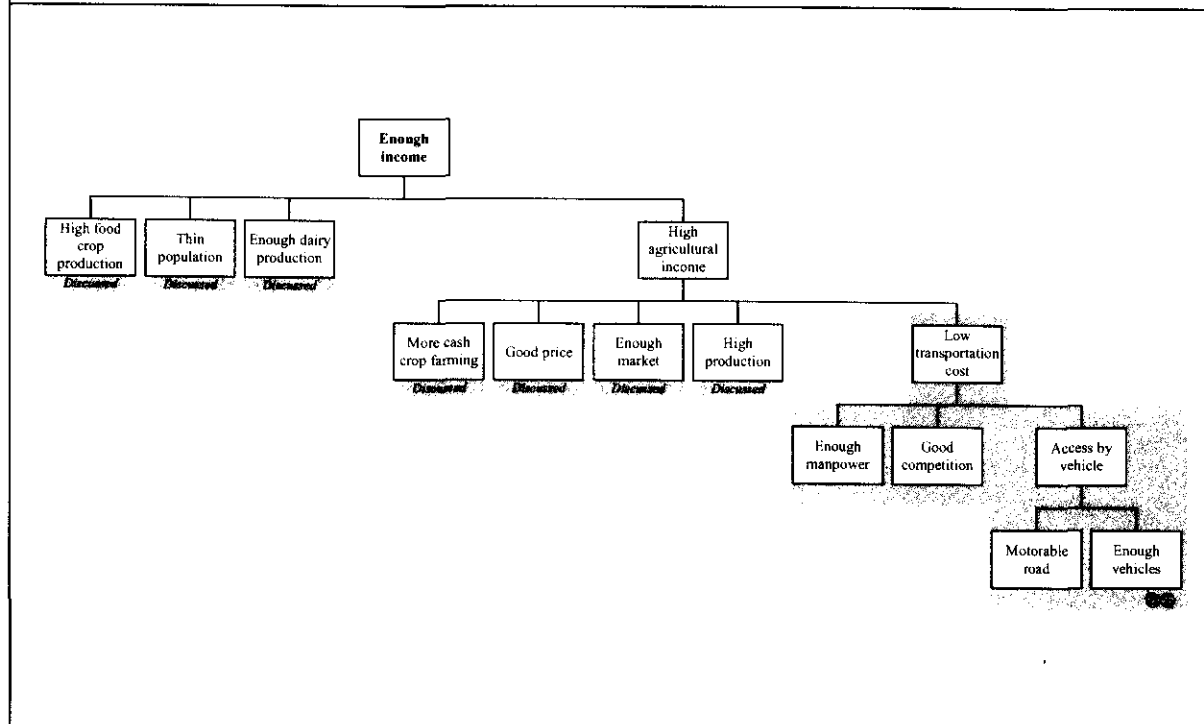
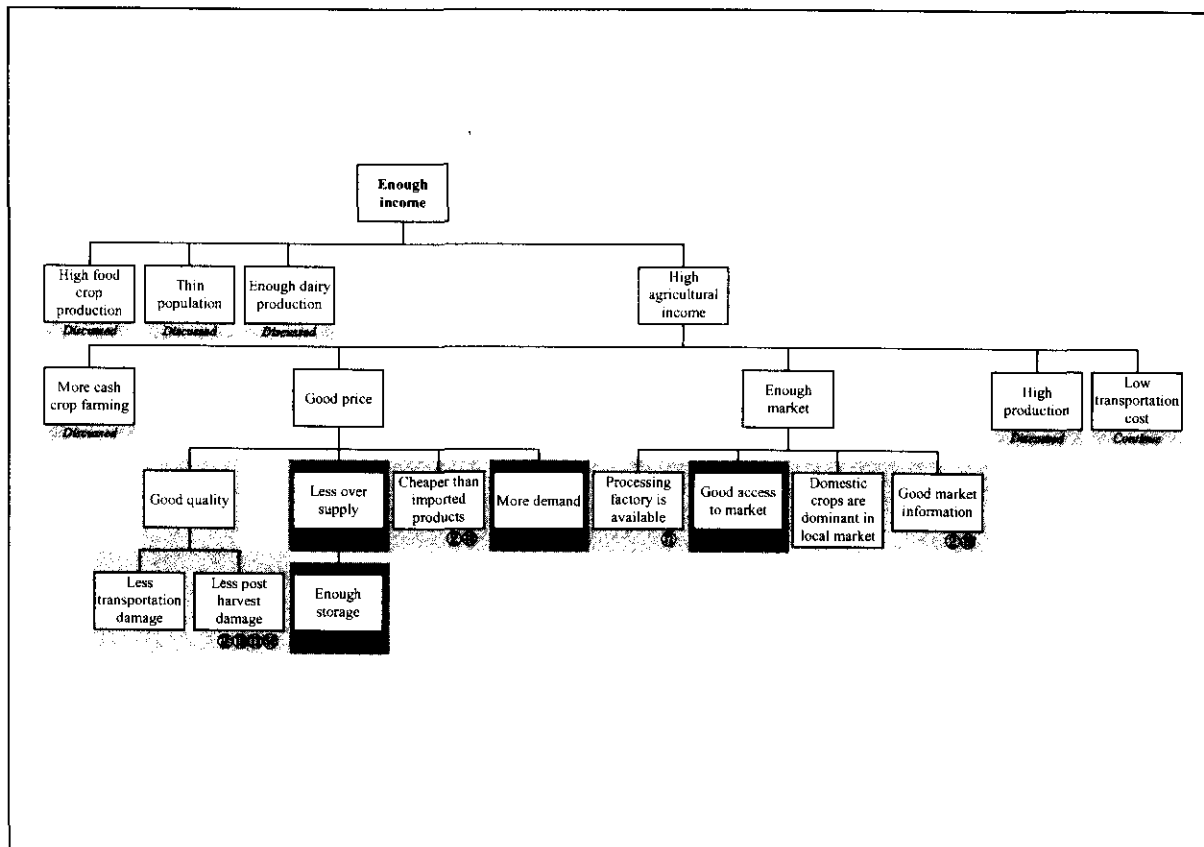


- ① Construction of Irrigation Facilities
- ② Agricultural Extension Services
- ③ Quality Control of Products
- ④ Land Slide Protection
- ⑤ Livestock Extension Service
- ⑥ Agro-Processing Support
- ⑦ Farm Road Construction
- ⑧ Construction of Cooperative Storage
- ⑨ Agricultural Material Support
- ⑩ Health Education
- ⑪ Market Construction
- ⑫ Cooperative Shipping

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

**Figure VIII-6 (2/4)
Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Close Gewog Leaders**

Japan International Cooperation Agency (JICA)

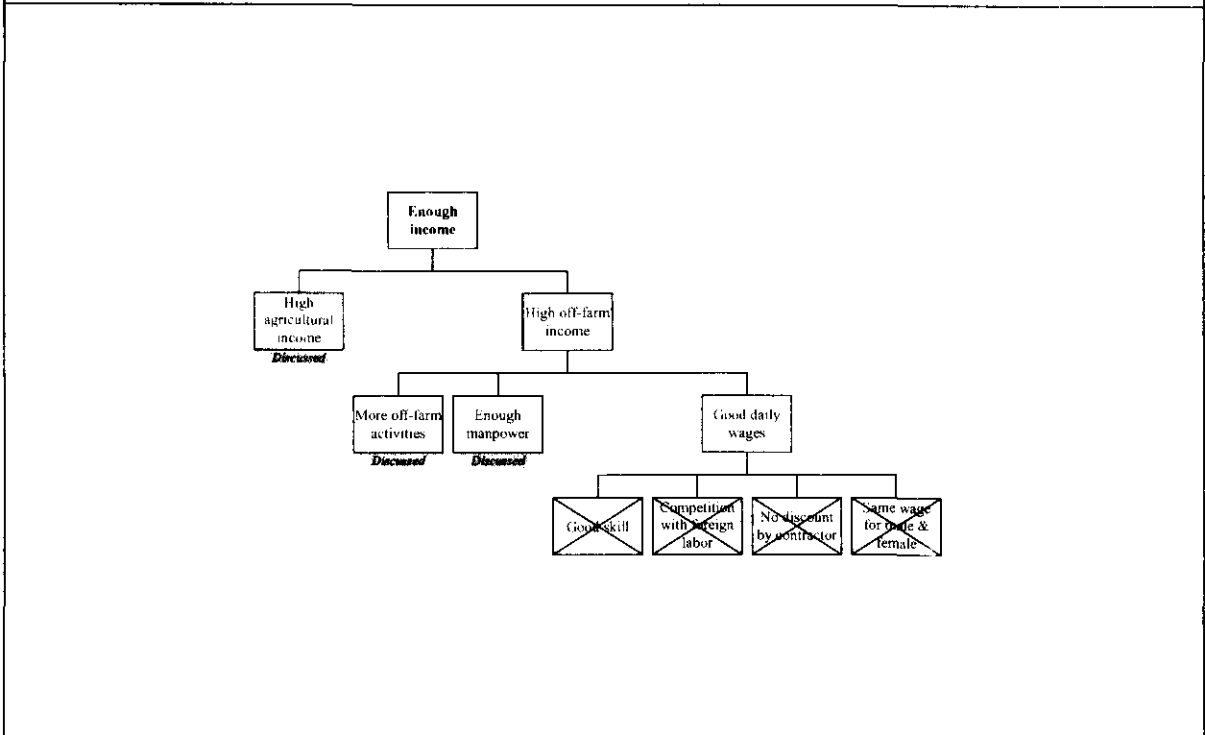
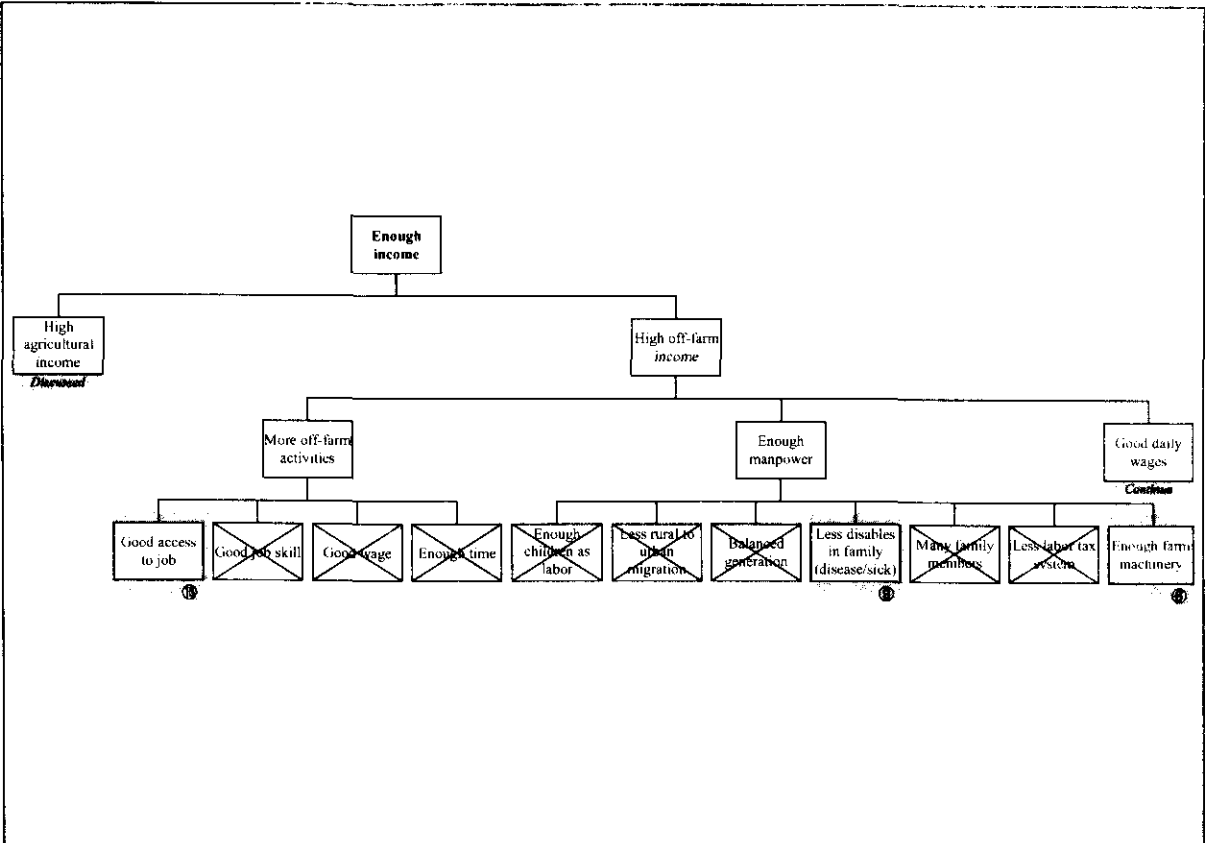


- ① Construction of Irrigation Facilities
- ② Agricultural Extension Services
- ③ Agricultural Material Support
- ④ Quality Control of Products
- ⑤ Land Slide Protection
- ⑥ Health Education
- ⑦ Livestock Extension Service
- ⑧ Agro-Processing Support
- ⑨ Market Construction
- ⑩ Farm Road Construction
- ⑪ Construction of Cooperative Storage
- ⑫ Cooperative Shipping

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

**Figure VIII-6 (3/4)
Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Close Gewog Leaders**

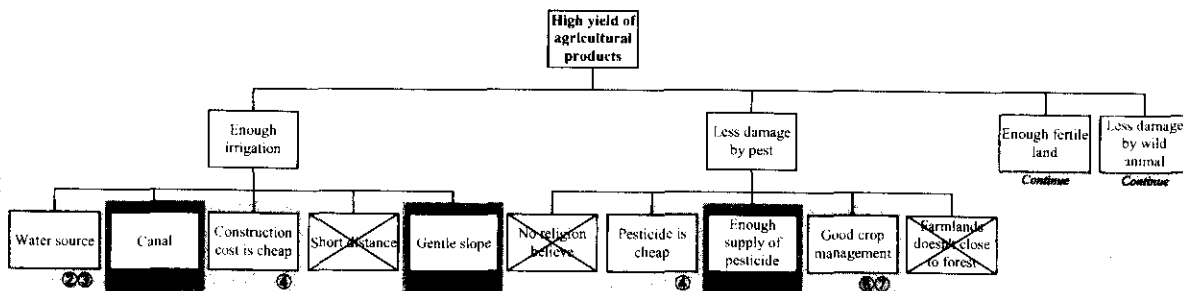
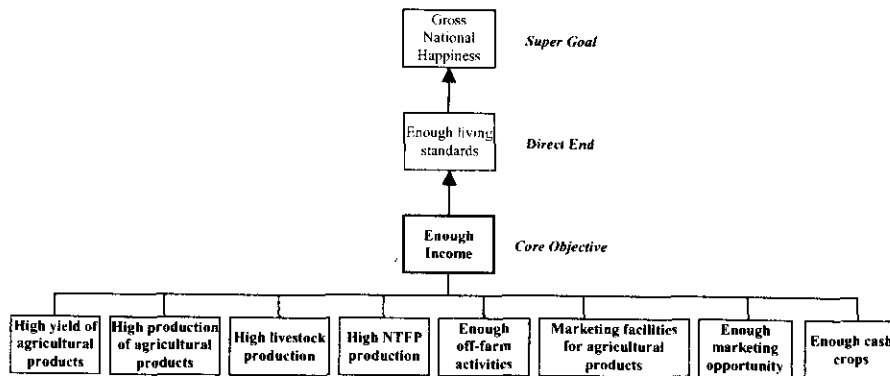


- ① Construction of Irrigation Facilities
- ② Agricultural Extension Services
- ③ Quality Control of Products
- ④ Land Slide Protection
- ⑤ Livestock Extension Service
- ⑥ Agro-Processing Support
- ⑦ Farm Road Construction
- ⑧ Construction of Cooperative Storage
- ⑨ Agricultural Material Support
- ⑩ Health Education
- ⑪ Market Construction
- ⑫ Cooperative Shipping

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Figure VIII-6 (4/4)
Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Close Gewog Leaders

Japan International Cooperation Agency (JICA)

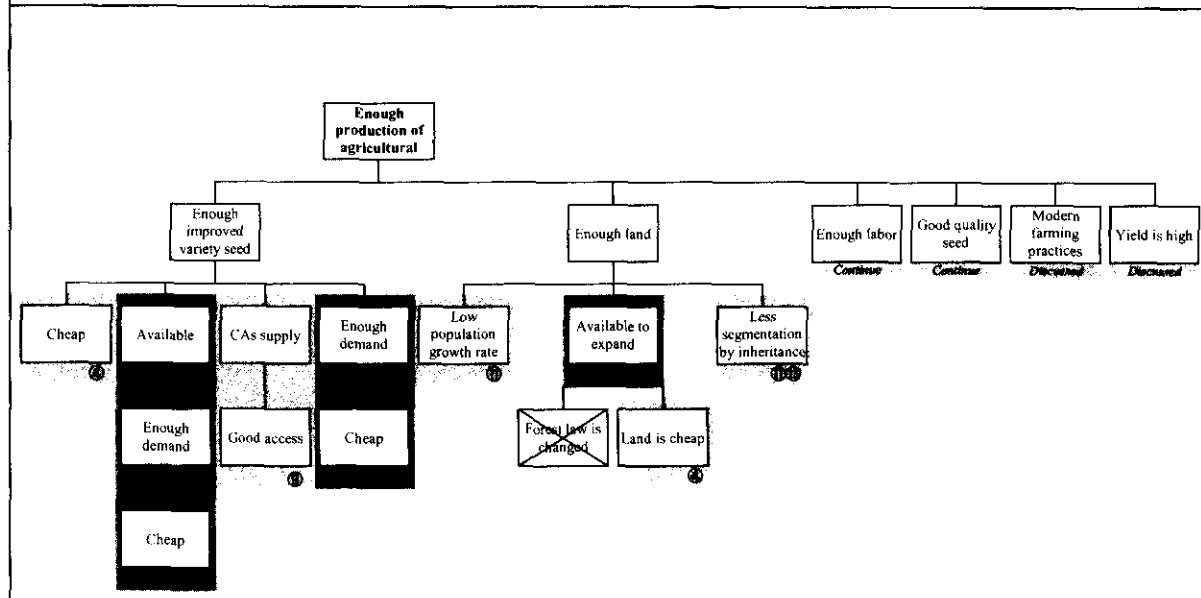
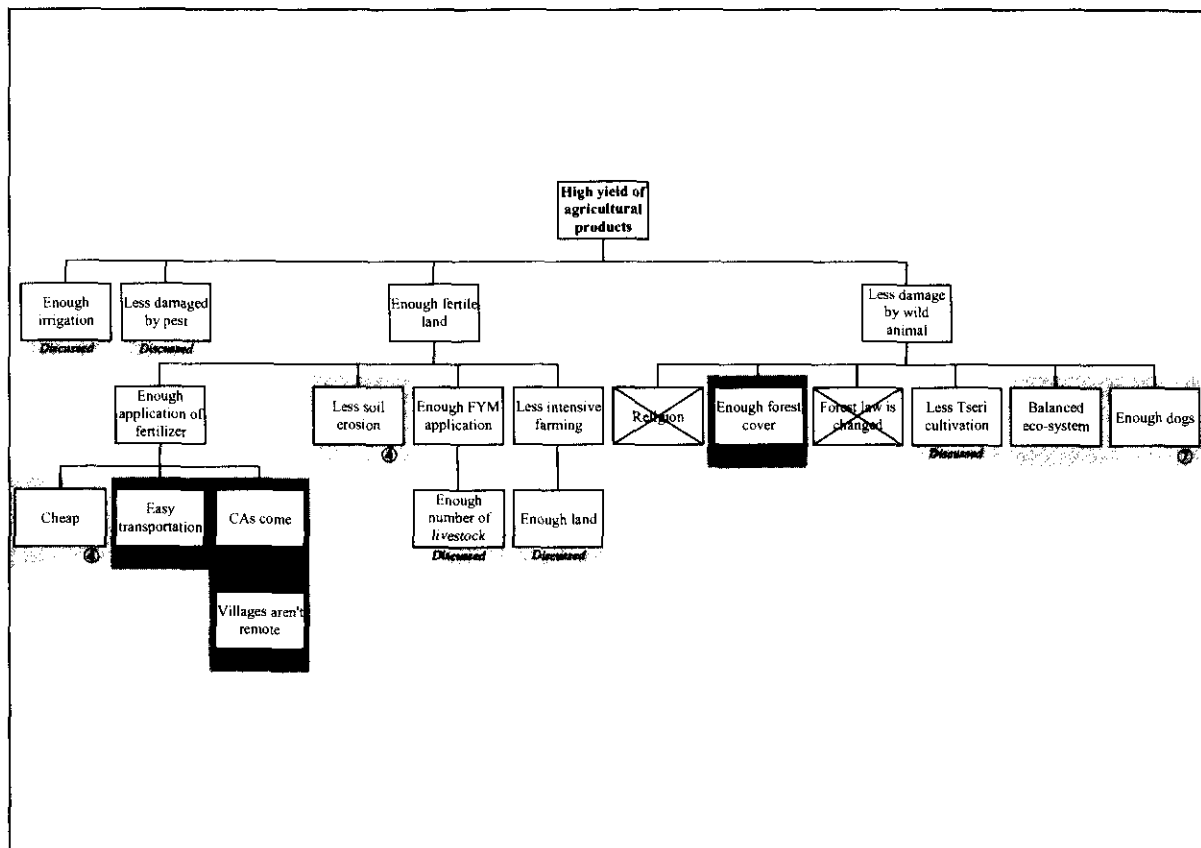


- ① Construction of irrigation facilities
- ② Conservation of catchments area
- ③ Water harvesting
- ④ Subsidy
- ⑤ Land reclamation
- ⑥ Training of CAs
- ⑦ Training of farmers
- ⑧ Training of EAs
- ⑨ Farm road construction
- ⑩ Forest conservation
- ⑪ Family planning
- ⑫ Conservation from Tseri to permanent cropping land
- ⑬ Resettlement
- ⑭ Farm mechanization
- ⑮ Vocational training for farmers

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

**Figure VIII-7 (1/5)
Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Remote Gewog Leaders**

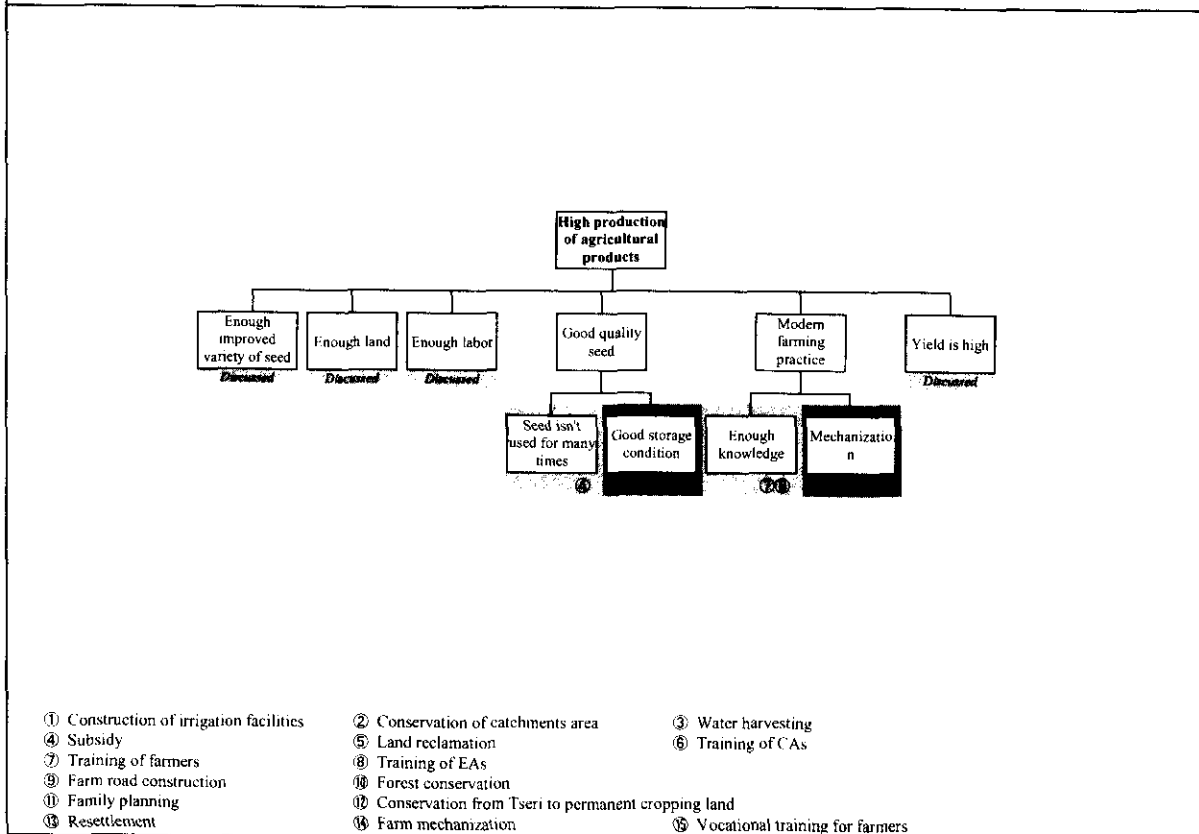
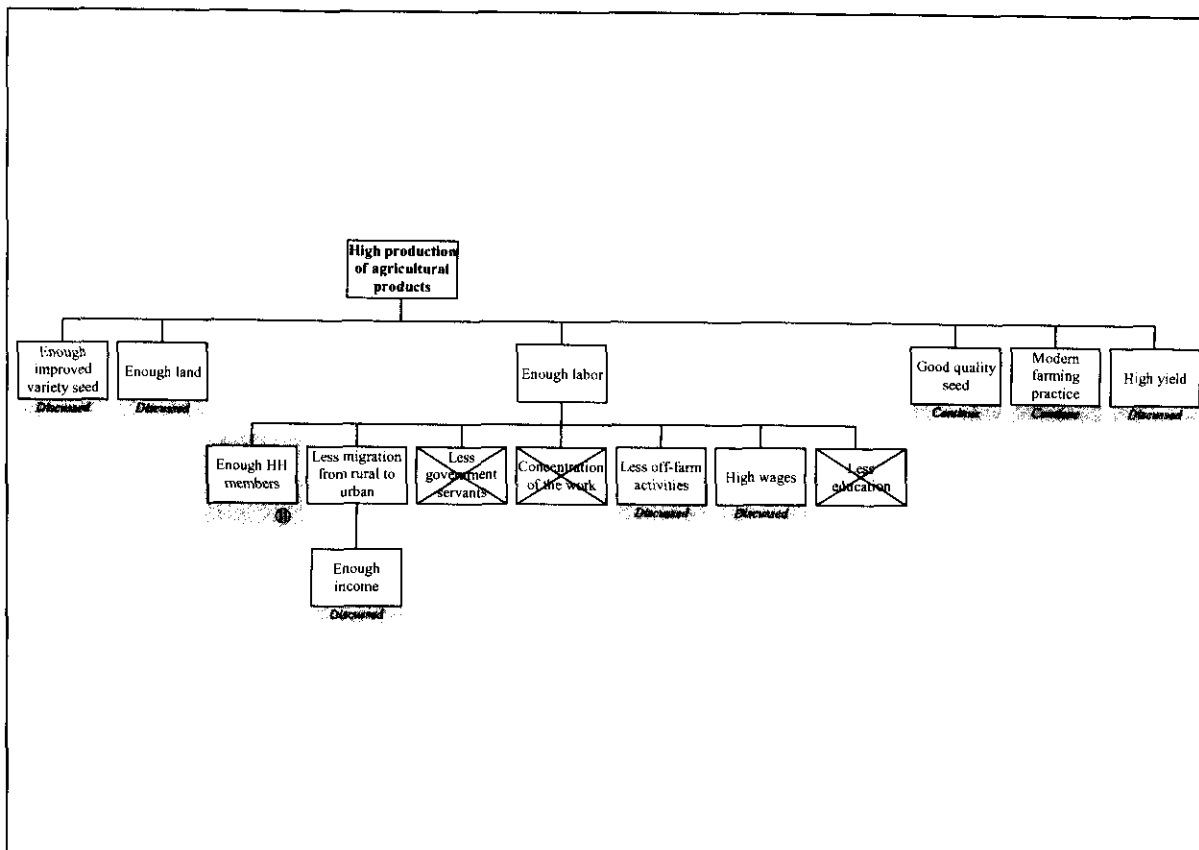


- ① Construction of irrigation facilities
- ② Conservation of catchments area
- ③ Water harvesting
- ④ Subsidy
- ⑤ Land reclamation
- ⑥ Training of CAs
- ⑦ Training of farmers
- ⑧ Training of EAs
- ⑨ Farm road construction
- ⑩ Forest conservation
- ⑪ Family planning
- ⑫ Conservation from Tseri to permanent cropping land
- ⑬ Resettlement
- ⑭ Farm mechanization
- ⑮ Vocational training for farmers

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA).

**Figure VIII-7 (2/5)
Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Remote Gewog Leaders**

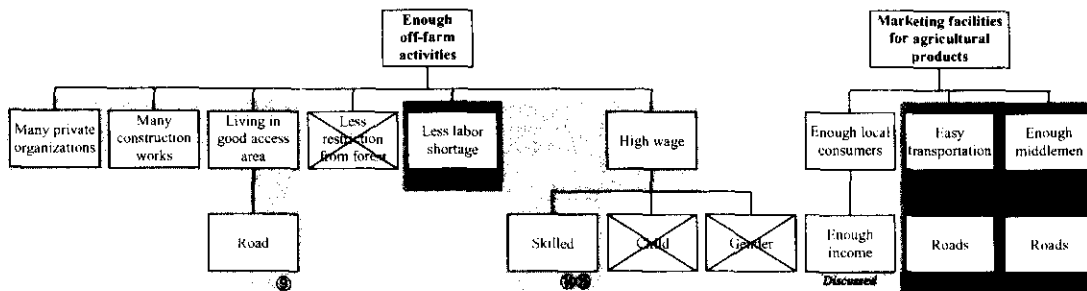
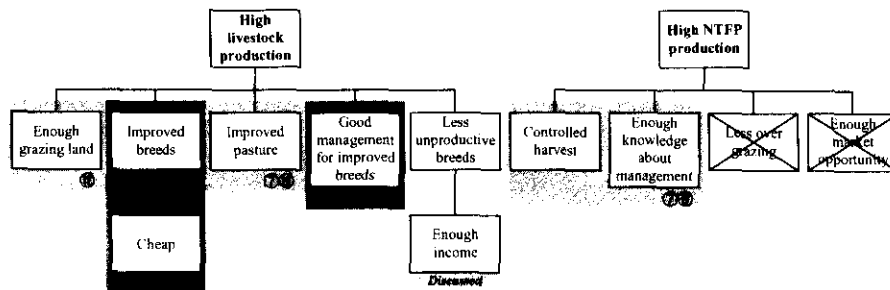


- ① Construction of irrigation facilities
- ② Conservation of catchments area
- ③ Water harvesting
- ④ Subsidy
- ⑤ Land reclamation
- ⑥ Training of CAs
- ⑦ Training of farmers
- ⑧ Training of EAs
- ⑨ Farm road construction
- ⑩ Forest conservation
- ⑪ Family planning
- ⑫ Conservation from Tseri to permanent cropping land
- ⑬ Resettlement
- ⑭ Farm mechanization
- ⑮ Vocational training for farmers

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

**Figure VIII-7 (3/5)
Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Remote Gewog Leaders**

Japan International Cooperation Agency (JICA)

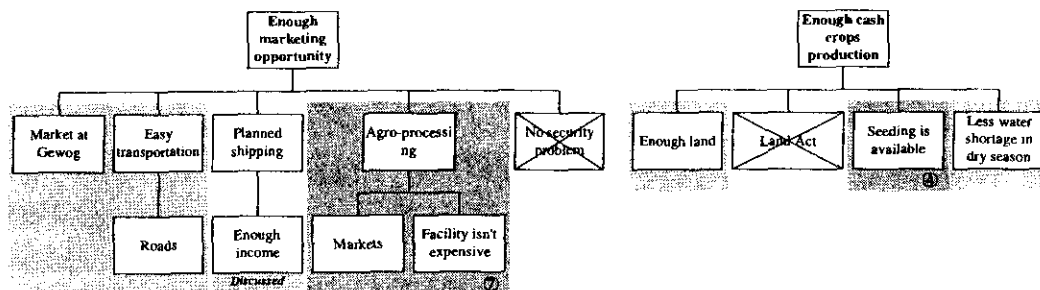


- ① Construction of irrigation facilities ② Conservation of catchments area ③ Water harvesting
- ④ Subsidy ⑤ Land reclamation ⑥ Training of CAs
- ⑦ Training of farmers ⑧ Training of EAs
- ⑨ Farm road construction ⑩ Forest conservation
- ⑪ Family planning ⑫ Conservation from Tseri to permanent cropping land

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

**Figure VIII-7 (4/5)
Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Remote Gewog Leaders**



- | | | |
|---|--|-----------------------------------|
| ① Construction of irrigation facilities | ② Conservation of catchments area | ③ Water harvesting |
| ④ Subsidy | ⑤ Land reclamation | ⑥ Training of CAs |
| ⑦ Training of farmers | ⑧ Training of EAs | |
| ⑨ Farm road construction | ⑩ Forest conservation | |
| ⑪ Family planning | ⑫ Conservation from Tseri to permanent cropping land | |
| ⑬ Resettlement | ⑭ Farm mechanization | ⑮ Vocational training for farmers |

The Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan

Japan International Cooperation Agency (JICA)

Figure VIII-7 (5/5)

Selected Approaches with Objective Tree in Mongar Dzongkhag Summarized by Remote Gewog Leaders

ANNEX-IX

***TECHNICAL TRANSFER THROUGH
OJT***

ANNEX-IX

Technical Transfer through OJT

Contents

	<u>Page</u>
Chapter IX-1 FARM ROAD CONSTRUCTION SEMINAR	IX-1
IX-1.1 Change of Farm Road Construction Seminar	IX-1
IX-1.2 Location and Works of Trial Farm Mule Track Construction.....	IX-1
IX-1.3 Supplied Tools and Equipment and its Procurement	IX-1
IX-1.4 Results of Questionnaire for Evaluation of Farm Road Construction Seminar	IX-3
Chapter IX-2 HORTICULTURE PRODUCTION SUPPORT	IX-6
IX-2.1 Objectives	IX-6
IX-2.2 Roles by Stakeholder	IX-6
IX-2.3 Process and Set-up of OJT	IX-7
IX-2.4 Results.....	IX-8
Chapter IX-3 SMALL-SCALE IRRIGATION SUPPORT	IX-10
IX-3.1 Objectives and Abstract of Result.....	IX-10
IX-3.2 Details of Pump and Introduced Location	IX-10
IX-3.3 Procurement and Application of Pump Set.....	IX-11

List of Tables

	<u>Page</u>
Table IX-1 Nos. of Participant & Works for Trial Farm Mule Track Construction in Khoma	IX-T1
Table IX-2 List of Farmers Distributed Vegetables Seeds and Piglets.....	IX-T2

ANNEX-IX

TECHNICAL TRANSFER THROUGH OJT

Chapter IX-1 FARM ROAD CONSTRUCTION SEMINAR

IX-1.1 Change of Farm Road Construction Seminar

The leveling of formation, widening road width and improvement of drainage facilities for existing farm road in the Study Area were proposed in the proposal submitted to JICA at the beginning stage as the farm road construction seminar to evaluate the following issues through this seminar.

- Conditions that allow the beneficiaries participate to the development works
- Examination of beneficiaries' skills for civil works such as earthwork, masonry, etc.
- Capacity of Dzongkhag staff and organization
- Time required for the procurement of the machines and construction
- Other problems and constraints

However, at present there is no existing farm road in the Study Area and the projects of farm road construction that one is at Minjay Gewog of Lhuntse and the other is at Chaskhar Gewog of Mongar are still under construction. Accordingly the seminar was carried out through trial farm mule track construction at Khoma Gewog of Lhuntse in consideration of the effectiveness of construction and demonstration. Because the farm mule track construction at Khoma Gewog is planned in the 9th FYP and the site is nearby District Road connecting between Lhuntse and Mongar just crossing the suspended bridge over the Kuri Chuu and furthermore the suspended bridge is planned to replace to light-load bridge through Japan's Grant Assistance for Grassroots Project.

IX-1.2 Location and Works of Trial Farm Mule Track Construction

Proposed farm mule track at Khoma Gewog of Lhuntse was selected for experimental implementation in consideration of the 9th FYP, too. The total length proposed for the implementation was one kilometer out of 6.3 km of proposed length of the Master Plan in total. Actually the construction was started on 13th September, 2002 after the ceremony of trial construction using certain hand tools procured beforehand.

The construction was mainly implemented by the beneficiaries themselves based on the certain instruction by the staffs of Dzongkhag Engineering Office in accordance with the policy of RGOB and almost completed by 20th October as estimated schedule remaining some additional works to improve the formation and alignment of farm mule track. The numbers of the participants to be the data for evaluating above issues and the details of works are shown in the Attachment.

IX-1.3 Supplied Tools and Equipment and its Procurement

The supplied tools and equipment for the trial construction are as follows and they were finally handed over to Dzongkhag for the further plan.

(1) List of Tools and Equipment

1. Portable Rock Drill (Type YN27J)

Specification

- 1) Weight of main machine: 27 kg
- 2) Overall dimension: 746 x 315 x 229 mm
- 3) Type of engine: single cylinder, air cooled two strokes
- 4) Rotating speed of engine: $\geq 2,450$ r/min
- 5) Displacement engine piston: 185 cm^3
- 6) Drilling speed: ≥ 250 mm/min
- 7) Max. drilling depth: 6 m
- 8) Fuel consumption: ≤ 0.12 l/m
- 9) Tank capacity: ≥ 1.5 liter

2. Hand Tools

- 1) Pickax: 20 Nos.
- 2) Hammer: 20 Nos.
- 3) Shovel: 20 Nos.
- 4) Crowbar: 20 Nos.
- 5) Spade: 20 Nos.

(2) Procurement of Tools and Equipment

Farm mule track is basically and actually constructed by the beneficiaries themselves, it means that the beneficiaries are definitely farmers. Therefore aforementioned hand tools to be used for the construction are quite easy to use for them as they are almost like farming instruments and also it is easy to procure the hand tools through the existing official subsidy system established in RGOB.

On the other hand, as for the portable rock drill, it was rather difficult to procure. Because the portable rock drill was firstly sounded its availability in India and had to be delivered taking slightly much time to the site through Phuentsholing where it is located in the southwest of Bhutan.

Then for the trial construction, the portable rock drill with engine was practically used since it is difficult to bring an air compressor on the existing suspended bridge at Khoma to the site of the trial construction crossing over the Kuri Chuu. However if the approach is not difficult to bring an air compressor to the site, it is thought that a rock drill to be functioned by air is more convenient than that with engine at the rocky area. Because the rock drill to be functioned by air is more durable than that with engine and not much trouble in simple structure.

(3) Procurement of Blasting Material

Blasting rock cannot be avoided for the construction of farm mule track at the site of rocky area. Unfortunately the site of Khoma was quite tough rocky area even at the trial stretch of the farm mule track construction.

Two types of the blasting materials have been used in the trial construction, one is the silent type and the other is the conventional type to use explosive, detonator and fuse coil. The silent type is a type of using chemical material to utilize the effect of swelling material itself for breaking rock and was introduced in consideration of reducing environmental affection at

and around the site.

The approval of Ministry of Home Affairs has to be necessary for using blasting materials. Since Lhuntse Dzongkhag has had the approval for the on-going project of farm road construction at Minjay Gewog, some blasting materials were arranged to properly share for the trial construction in Dzongkhag. Thus, the arrangement to obtain the approval of Ministry of Home Affairs has to be executed for the further plan in advance.

IX-1.4 Results of Questionnaire for Evaluation of Farm Road Construction Seminar

As a conclusion of the trial farm mule track construction for the farm road construction seminar, the evaluation meeting was held at the beginning point of farm mule track in Khoma Gewog on November 22, 2002.

And at the same time, questionnaire from 30 beneficiaries selected as an informant out of all beneficiaries' attendant to the evaluation meeting was executed. The questionnaire is shown in the attachment and its results is as follows;

1. General Information on Participants (Informants)

- ① Informant: Male (30), Female (0)
- ② Age: Range from 19 to 43 years,
19 years (2), 20 to 29 years (16), 30 to 39 years (10), above 40 years (2)
- ③ Head of household: Yes (11), No (16), N.A (3)
- ④ Village name: They were coming from 9 villages in total,
Maximum Nos. of dispatch from village (6),
Minimum Nos. of dispatch from village (1)
- ⑤ Hour: Range from 1.0 to 6.0 hours,
1.0 hour (4), 1.5 hours (2), 2.0 hours (4), 2.5 hours (4), 3.0 hours (4),
4.0 hours (8), 5.0 hours (3), 6.0 hours (1)

-The participation of beneficiaries will be possible even it is a bit far away from the site for the participants.

2. Reason of participation to the works

Gup's instruction (30)

Others: to earn money, daily wage (This is included in above answers describing in the others)

-It was found that Gup has the power to control the directionality of Gewog's development plan.

3. What do you want when you participate to the construction works?

Money (28), food (1), nothing (1)

-The beneficiaries prefer to be paid, but they would be willing to work without payment if they have no chance to have farm road without labor contribution, it is thought considering the replies for the 10th Questionnaire.

4. How many persons were working from your family?

One person (30)

-Basically delivery quota might be one person from every household.

5. How many days did you work?

Day: Range from 5 to 38 days,

5 days (15), 10 days (12), 30 days (1), 33 days (1), 38 days (1)

6. Which month can't you work?

Impossible to work from July to August (8), Possible to work in winter season (2),

By village turn (18), Gup's instruction (1), N.A (1)

-The informants were confusing this question, however they could work excepting the period from July to August conforming a busy farming season in general.

7. What was the problems in participating to the works?

No problem (23), Dangerous to work at rocky area (without any prevention and safety device (6), N.A (1)

-It is properly indicated the physical condition at the site and beneficiaries' feelings in terms of the safety construction, actually the farm mule track construction is technically not so difficult except blasting work and masonry in the trial construction.

8. What will be the benefit for your family if the farm mule track reaches Khoma?

Easy to transport (27), No benefit (2), N.A (1)

-The informants replied "No benefit" might come far place from construction site.

9. How do you think of participation of women to the construction works?

No problem (0), It's to avoid (25), Light work only (8), Women should concentrate household works (12), N.A (2): 2 answers replied by the informant are included.

-As a feeling of Bhutanese, they have thought emotionally that females had better not work at the construction site usually. It is possible to find out above situation based on the replies.

10. Can you continue working for further construction works? Yes / No

Yes (29), No (0), N.A (1)

Questionnaire for the Participants to Farm Mule Track Construction Seminar

1. General Information on Participants
 - ① Male / Female
 - ② Age: _____
 - ③ Are you the head of your household? Yes / No
 - ④ Village Name _____
 - ⑤ How long does it take from your house to the construction site? ____ hours
2. Reason of participation to the works
Gup's instruction / as labor tax / own judgment /
Others _____
3. What do you want when you participate to the construction works?
Money / food / nothing /
Others _____
4. How many persons were working from your family?
_____ persons
5. How many days did you work?
_____ days
6. Which month can't you work?

7. What was the problems in participating to the works?

8. What will be the benefit for your family if the farm mule track reaches Khoma?

9. How do you think of participation of women to the construction works?
No problem/ It's to avoid / Light work only /
Women should concentrate household works /
Others _____
10. Can you continue working for further construction works? Yes / No

Thank you

Chapter IX-2 HORTICULTURE PRODUCTION SUPPORT

IX-2.1 Objectives

Horticulture development is a main component of the Master Plan for income increase of beneficiaries. Purpose of the OJT is to transfer technology on horticulture cultivation and backyard animal husbandry to counterpart and staff (especially extension agents) / beneficiaries concerned as well as to utilize the results and lessons obtained for formulation of the Action plan. The following issues were expected to be clarified through the OJT implementation:

- Problems that might arise in the formation process of the farmers' group,
- Problem that might arise in receiving and returning for the supporting services,
- Ability of farmers in farming practices / animal husbandry,
- Capacity and ability of EA's activities in the field
- Farm budget, production and yield,
- Confirmation of beneficiaries' attitude to cash crop cultivation and backyard animals, and
- Other problems on the horticulture crop cultivation.

IX-2.2 Roles by Stakeholder

Roles of the Study Team, Dzongkhag (DAO and DAHO), Extension Agent in Gewog and beneficiaries (participants) were as follows:

Study Team

- Procurement of vegetable seeds and piglets, and
- Technical advice to EA on crop management, animal husbandry and EA's activities to farmers group

Dzongkhag

- Selection of locations to be implemented,
- Technical support to EAs, and
- Transportation of piglet from PPBC to the distribution point along motor road

Extension Agents

- Explanation to farmers on the trial implementation,
- Collection of applicants and selection of participants,
- Formation of farmers group for extension activities,
- Technical guidance to participants through group and to individual farmers, and
- Submission of monitoring report to the Study Team through DAO/DAHO

Participants

- Provision of required labor force, land and facility for the crop cultivation and animal husbandry, and input such as fertilizer, animal feed, and
- Getting technical guidance and extension service by EA

IX-2.3 Process and Set-up of OJT

Ten kinds of vegetable seeds (shown below table) and 74 heads of piglet (3 month) were distributed to the farmers of target area at free of charge. The target areas for the OJT were selected by DAO and DAHO of Dzongkhags, conformed to the criteria prepared by the Study Team as follows:

- Potential area of vegetable production and backyard animal husbandry,
- Area in which farmers have high consciousness on potential of horticulture and small animals, and
- In good physical access for the team members,

Vegetable Seeds Distributed				
Name of vegetables	Variety	Weight of seed (g/pack)	Price (Nu./pack)	No. of packs
1 Cabbage	BSE-3	10	10	20
2 Cauliflower	Snow ball	10	15	20
3 Carrot	Kurada	10	15	20
4 Broccoli	Nobgang	10	15	20
5 Dwarf bean	Top crop	50	10	50
6 Turnip	Purple Top	10	10	20
7 Mustard green	Him beauty	10	10	30
8 Lettuce	Ice berg	5	10	20
9 Radish	Minoase	10	10	50
10 Green pea		50	10	50
Total				300

As the results of discussion with Gewogs, DAO and DAHO selected the areas and participants of 20 farmers and one farmers group (20 members) for vegetable cultivation, and 51 farmers and one farmers group for backyard animal husbandry (74 piglets) shown Table IX-2.3.1 and summarized as follow:

Participants of Horticulture Production Support		
	Vegetable seeds	Piglet
Lhuntse Dzongkhag	Farmers group (20 members)* for vegetable production in Jang Village	31 farmers and one vegetable farmers* group in 6 Gewogs; 37 heads in total.
Mongar Dzongkhag	12 farmers in Serimuhang Gewog, and 8 farmers in Tsakaling Gewog	20 heads to 12 farmers in Serimuhang Gewog, and 17 heads to 8 farmers in Tsakaling Gewog; 37 heads to 20 farmers in total
Total	20 farmers and one farmers group (20 members)	74 heads to 51 farmers and one farmers group (20 member)

Note: Same farmers group in Jang Village, Gangzur. It was established in 2001.

The support had planed by the Team at initial stage as follows:

- To distribute vegetable seeds, seedlings of fruits tree and backyard animals (pig and poultry) to farmers groups organized by EAs,
- To distribute required chemical fertilizer for vegetables cultivation and materials for animal pen/shed installation at free of charge,

Through the discussion with DAO and DAHO, the OJT was carried out in the following manner:

- Participant receive group guidance by EA in the village or Gewog except the existing registered farmers group in Gangzur (cooperative),
- Fertilizer and chemicals were prepared by the participants themselves, because FYM is generally applied to vegetable cultivation,
- Timing of distribution of fruit seedling was too late for planting, because watering to seedling in the dry season was difficult,
- Only piglet were distributed, because chicks were in short for distribution in PPBC due to plenty of orders in the season, and it would take more than three months from the time of order, and
- Animal sheds were prepared by the participants, because some farmers had pig shed constructed with local materials.

As a result, vegetable seeds and piglet were distributed to the participants through extension agents at the end of August 2002. Dzongkhags provided transportation of piglet from PPBC to the motor road near by the Gewog.

Study Team visited the target areas with EAs, and gave technical guidance to farmers and EAs. EAs held technical guidance at field for group farmers more than several times during the two months from distribution to end of November. Attendance of farmers to the guidance was reported 60 % to 85 %.

IX-2.4 Results

The following lessons and feedback were obtained through the experimental implementation.

- It was confirmed that farmers have high intension to promote vegetable production and backyard animal husbandry. According to EAs, many farmers requested for the distribution of vegetable seeds and piglet. Generally more than 50 % of farmers have experience of pig rearing. Most of them prefer fattening of pig to breeding because of the difficulty of mating under the condition of scattered houses and steep slopes. Breeder farmers have to rear more than two heads of pigs including a pair of pig. Small farmers cannot provide sufficient feed to the pigs due to lack of feed. It is proposed that group of small farmers should operate pig breeding,
- One farmers group participated in the OJT. The group with 20 members was established for vegetable production. Dzongkhag and EAs supported the group activity. The group activities were participated by all the members, and managed by the leaders such as the chairman, accountant and clerk. The farmers group was established in 2001 in Lhuntse Dzongkhag. The group sells the products to school dormitory and hospital staff. The profit for one year was only Nu. 1,700. The most serious problem is lack of market / consumers in the Gewog. The farmers group activities are well operated and managed,
- Cultivation technology of vegetable was still low, especially for unfamiliar crops to the farmers. Knowledge and technology on nursery management, planting density, and crop management have not been disseminated to the farmers. It is necessary to disseminate improved farming technology intensively.
- As for farm budget, production and yield could not be clarified because of short-term implementation and low temperature condition in the dry season. Farmers generally use FYM for vegetables, but do not use chemical fertilizer.

Backyard animal husbandry provides animal dung for preparation FYM mixing with leaf litter in the forest.

- EA provided technical guidance to the participants at the time of the distribution, nursery preparation, and as required. Extension agents submitted monitoring and activity reports to the Study Team through DAO and DAHO. According to the reports, the following problems and constraints were clarified.
 - Low germination rate of some vegetables, especially cabbage; it is supposed to be by low quality of the seeds.
 - Farmers tend to grow vegetables with higher density than that of instruction by EA, especially for transplanting.
 - Due to much rainfall in the planting / sowing season, germination and initial growing were not well,
 - Crop damage by wild animal and cattle occurred seriously. However, the crop protection against animal damage is costly and not affordable,
- Fattening farmers and breeding farmers participated in this OJT. Around 80 % of the participants were with experience of pig rearing. Some (4 farmers and a farmers group) of them were breeder farmers of piglets. Sheds for the distributed piglet were installed by the farmers using timber or used old pig shed. Piglet was distributed at three months old with 4 - 5 kg of weight. After two months they had grown to 7 – 10 kg. Feeding condition caused difference in growth. Main feeds for pig were maize, rice bran, low-grade cereals, leaves of crops and banana. It was reported that one piglet died in Serimuhang Gewog after one month of the distribution due to disease.

Chapter IX-3 SMALL-SCALE IRRIGATION SUPPORT

IX-3.1 Objectives and Abstract of Result

(1) Objectives

Considering topographic conditions and scattered distribution of small farm lands in the Study Area, gravity irrigation system with fixed intake facilities is not always the best irrigation method. The gravity irrigation system often requires long feeder or headrace canal which should be constructed along the steep slope.

On the other hand, pump irrigation with small engine pump and flexible hose is often useful for the steep and small farm plots distributed on the slope. Therefore in consideration of the Study Area's topographic conditions and problems derived from such conditions like irrigation canal blockage with debris by land slide as well, Small-scale Irrigation Support was executed to confirm the effectiveness of introduction of pump irrigation with small engine.

Concretely, the small-scale irrigation support is an approach to provide farmers' group with portable pump and flexible hose for irrigation their plots turn wise, the following issues were expected to be clarified though the OJT:

- Problems that arise in the formation of the farmers' group
- Problems that arise in receiving and returning for the supporting services
- Ability of farmers in using pumps
- Actual driving hours, required fuel, irrigated area
- Other problems on the pump irrigation

(2) Results

Since the Study was mostly carried out in the rainy season and farming season, the farmers and EAs related to the experimental implementation at the site could not spare enough time for this. In spite of such actual situation for the experimental implementation, the results were found as follows:

- Though the pump is priming type and fitted with a foot valve at the end of suction pipe, priming water to the pump was required.
- Suction heads must be kept as small as possible (less than 4.0 m) in consideration of irrigated area, theoretical reason (air pressure) and the capacity of total heads for pump as the total heads is independent by pump.
- Tentative pump water users association was composed at the site of JICA No.3 by the instruction of Dzongkhag to beneficiaries.
- Lifting water by pump is possible from any scale of water source keeping the certain depth from surface of the water of the source and the suction pipe point.
- Since some of the staff of Dzongkhag and EAs knew how to use engine and pump, introduction of pump for irrigation did not meet much trouble in particular.

IX-3.2 Details of Pump and Introduced Location

(1) Details of Pump

The pump is priming type, 2 inch each diameter of suction and distribution with engine and its weight is 12 kg. It is really a portable pump that is framed in steel pipe to carry. And

flexible suction pipe (7 m) and plastic distribution hose (100 m) were procured with the pump taking into account of theoretical suction head and the possibility of various water sources and irrigation coverage for the experimental implementation. The details of pump specification are as follows;

1. Portable Water Pump (Yamaha water pump with engine)

Specification

- 1) Weight of Pump: 12 kg
- 2) Diameter of suction: 2 inch
- 3) Diameter of delivery: 2 inch
- 4) Frame: With frame to carry

2. Fittings and others

- 1) Delivery hose (plastic): 328' (100 m)
- 2) Suction hose (flexible): 23' (7 m)
- 3) Non return valve: 1 No.
- 4) Bucket: 1 No.
- 5) Fuel container: 2 Nos. (for kerosene and petroleum)
- 6) Clamps: 4 Nos.
- 7) Pliers: 1 Nos.

Three Nos. of above pump with the following manufacturing No. were procured and distributed to the certain places shown in (2) Introduced Location.

JICA No.1: MH01-01067/ A67-687 (Engine/Pump)

JICA No.2: MH01-01074/ A67-682 (Engine/Pump)

JICA No.3: MH01-01036/ A67-551 (Engine/Pump)

(2) Introduced Location

Number of pump is three sets for Lhuentse and Mongar Dzongkhags and they were distributed in consideration of the water source and access for the experimental implementation as follows:

Location of Pump			
Pump	Village, Gewog, Dzongkhag	Water Source	Remarks
JICA No.1	Kafu, Serimuhang, Mongar	Seri Chhu (middle scale)	Feeder road is reached nearby the site.
JICA No.2	Autsho, Tsenkhar, Lhuentse	Kuri Chhu (large scale)	Access to the site is not so far from District Road.
JICA No.3	Phawan, Tsenkhar, Lhuentse	Stream (small scale)	The site is nearby RNR Center of Tsenkhar for mainly demonstration.

Finally JICANo.1 was introduced on 3rd October, and JICA No.2 and 3 were introduced on 8th November in consultation with each Dzongkhag's DAO and DEO and their arrangement and coordination with the beneficiaries.

IX-3.3 Procurement and Application of Pump Set

(1) Procurement

There is no hardware shop supplying directly a pump set even in Thimphu, capital of Bhutan, therefore a pump set should be procured from India through Phuentsholing located in the southwest of Bhutan in consideration of the availability of that. Thus procuring pump set will

be troublesome for the introduction of pump.

In this Study, the procured pump sets could not be investigated fully their specification beforehand checking it only by means of exchanging e-mail with a supplier of Phuentsholing. Consequently the pump sets having enough water head matching with the physical conditions of Bhutan that is mountainous and the source of water like river or stream is located at lower portion of farmland area could not be procured. Also the procured flexible delivery hose made in India for the pump set was not enough in quality comparing with that of Japanese made. It was deteriorated and having holes in some places.

Considering the repairing and maintenance of a pump set including its fittings, it would be better to procure them of Indian product from India for Bhutan. It is preferable that checking pump's specification and the quality of fittings and materials has to be required beforehand as it is explained in above.

(2) Application

Time was not enough to find out appropriate locations for installing pump set with engine in this Study. However, as DRDS of MOA is studying the introduction of pump to be connected with the flywheel of power-tiller to get the irrigation water from river or stream directly and effectively, there will be many candidate places not only in the Study Area but also entire Bhutan.

Tables

Table IX-1 Nos. of Participant & Works for Trial Farm Mule Track Construction in Khoma

Date	Male(Nos.)	Female(Nos.)	Details of Works
Sep. 9 (Mon.)			Meeting among stakeholders
Sep. 10(Tue.)			Arrangement of tools
Sep. 11(Wed.)			Arrangement of tools
Sep. 12(Thr.)			Procurement of tools
Sep. 13(Fri.)	18	3	Beginning of trial construction, Ceremony
Sep. 14(Sta.)	18	3	Excavation by manual using hand tools
Sep. 15(Sun.)	18	-	Excavation by manual using hand tools, Holes drilled for blasting by rock drill
Sep. 16(Mon.)	18	-	Excavation by manual using hand tools, Holes filled with materials were blasted
Sep. 17(Tue.)	-	-	No work
Sep. 18(Thr.)	-	-	No work
Sep. 19(Fri.)	-	-	No work
Sep. 20(Sta.)	-	-	No work
Sep. 21	-	-	No work
Sep. 22	-	-	National festival, no work
Sep. 23(Mon.)	25	-	Excavation by manual using hand tools, Holes drilled for blasting by rock drill and were blasted
Sep. 24(Tue.)	24	-	- Ditto -
Sep. 25(Wed.)	21	-	- Ditto -
Sep. 26(Thr.)	19	-	- Ditto -, Progress could not be much done due to rocky area
Sep. 27(Fri.)	18	-	Excavation by manual using hand tools, Holes drilled for blasting by rock drill and were blasted
Sep. 28(Sta.)	18	-	- Ditto -
Sep. 29	15	1	- Ditto -, Construction of dry masonry wall at the shoulder
Sep. 30(Mon.)	19	-	- Ditto -
Oct. 1(Tue.)	19	3	Excavation by manual using hand tools, Holes drilled for blasting by rock drill and were blasted
Oct. 2(Wed.)	12	-	- Ditto -
Oct. 3(Thr.)	19	2	- Ditto -
Oct. 4(Fri.)	18	2	- Ditto -
Oct. 5(Sta.)	20	3	- Ditto -, Progress could not be much done due to rocky area
Oct. 6(Sta.)	26	3	- Ditto -
Oct. 7(Mon.)	28	4	- Ditto -, Excavation also started from the other side
Oct. 8(Tue.)	18	3	- Ditto -
Oct. 9(Wed.)	18	3	- Ditto -, Meeting among stakeholders
Oct. 10(Thr.)	15	-	Excavation by manual using hand tools, Holes drilled for blasting by rock drill and were blasted
Oct. 11(Fri.)	12	-	- Ditto -
Oct. 12(Sta.)	12	-	- Ditto -
Oct. 13(Sta.)	12	-	- Ditto -
Oct. 14(Mon.)	6	-	Holes drilled for blasting by rock drill mainly and were blasted
Oct. 15(Tue.)	6	-	- Ditto -
Oct. 16(Wed.)	6	-	- Ditto -
Oct. 17(Thr.)	4	-	- Ditto -
Oct. 18(Fri.)	4	-	- Ditto -
Oct. 19(Sta.)	4	-	- Ditto -
Oct. 20(Sta.)	4	-	- Ditto -
Total	494	30	
Grand Total		524	

Note: Additional works were implemented to improve the formation and alignment after above period.

Table IX-2 List of Farmers Distributed Vegetable Seeds and Piglets

No.	Name of Farmers	Piglet			Remarks	Vegetable Seeds
		Gewog	Village Name	No. of piglets		
Lhuntse Dzongkhag						
1	Yeshi Norbu	Tshengkhar	Phawan	2	Breeding	
2	Pema Tenzen	Tshengkhar	Mantshang	2	Breeding	
3	Phurpala	Tshengkhar	Autsho	1	Fattening	
4	Ugyen	Tshengkhar	Chabe	1	Fattening	
5	Karma	Tshengkhar	Solodrang	1	Fattening	
6	Dechen Uden	Tshengkhar	Tangphugang	1	Fattening	
7	Sangay	Tshengkhar	Wambur	1	Fattening	
8	Sonam Galyphu	Minjay	Menjitse	1	Fattening	
9	Dechen	Minjay	Dalodowa	1	Fattening	
10	Tashi Norbu	Minjay	Pumogang	1	Fattening	
11	Pekimo	Minjay	Tongling	1	Fattening	
12	Gembu Tshering	Menbi	Phadidung	1	Fattening	
13	Gembo	Menbi	Phagidung	1	Fattening	
14	Wanngdi	Menbi	Brangmaybrangsa	1	Fattening	
15	Somtenla	Menbi	Brangmaybrangsa	1	Fattening	
17	Tshewang Penjor	Menbi	Brangmaybrangsa	1	Fattening	
18	Towmo	Menbi	Brangmaybrangsa	1	Fattening	
16	Wangala	Menbi	Tangmachu	1	Fattening	
19	Tenzen Dema	Menbi	Tangmachu	1	Fattening	
20	Karma Malma	Gangzur	Gangzoor	1	Fattening	
21	Tashi Wangmo	Gangzur	Gangzoor	1	Fattening	
22	Community Organization for Vegetable Growers in Jang Village (20 members)	Gangzur	Jang	3	Breeding (Farmer group)	○
23	Yangchen	Gangzur	Jang	1	Fattening	
24	Tshewang Norbu	Gangzur	Jang	1	Fattening	
25	Dorji Rinchen	Gangzur	Shawa	1	Fattening	
26	Karma Tshering	Gangzur	Khompang	1	Fattening	
27	Singay Phuntsho	Khoma	Khoma	1	Fattening	
28	Samphey	Khoma	Baptong	1	Fattening	
30	Dorjee	Khoma	Baptong	1	Fattening	
31	Pezang	Khoma	Baptong	1	Fattening	
29	Kunzangla	Khoma	Zangkhar	1	Fattening	
32	Ghallay	Kurtoe	Dungkhar	2	Fattening	
Sub-total				37		1 farmers group
Mongar Dzongkhag						
1	Kezang	Serimuhang	Gangmung	2		○
2	Jigme	Serimuhang	Gangmung	1		○
3	Sonam	Serimuhang	Gangmung	2		○
4	Pema	Serimuhang	Gangmung	1		○
5	Dupa	Serimuhang	Gangmung	1		○
6	Phety	Serimuhang	Gangmung	1		○
7	Phurpa	Serimuhang	Tshenchu	2		○
8	Ugyen	Serimuhang	Tshenchu	3	Breeding	○
9	Phuntsho	Serimuhang	Tshenchu	1		○
10	Kezang Dorji	Serimuhang	Golmung	2		○
11	Tandin Tshewang	Serimuhang	Golmung	2		○
12	Kinzang	Serimuhang	Malatng	2		○
Sub-total				20		12 farmers
1	Sonam Eden	Tsakaling	Nertshi	2		
2	Dirji Dema	Tsakaling	Nertshi	3	Breeding	○
3	Nampola	Tsakaling	Nertshi	2		○
4	Pema Dechen	Tsakaling	Nertshi	2		○
5	Kezang	Tsakaling	Nertshi	2		○
6	Ugyen Namgay	Tsakaling	Janglaghot	2		○
7	Kezang	Tsakaling	Janglaghot	2		○
8	Kezan Tshering	Tsakaling	Singmanaka	2		○
Sub-total				17		8 farmers
Total		63 farmers		74		20 farmers and 1 farmers group

ANNEX-X

***GUIDELINE FOR FORMULATION OF
ACTION PLAN***

ANNEX-X

Guideline for Formulation of Action Plan

Contents

	<u>Page</u>
Chapter X-1 INTRODUCTION	X-1
X-1.1 General	X-1
X-1.2 Objectives of the Guideline	X-2
X-1.3 Composition of the Guideline.....	X-2
X-1.4 Coverage of the Guideline	X-2
Chapter X-2 Approach of Formulation of Action Plan.....	X-3
X-2.1 Definition of Action Plan	X-3
X-2.2 Concept of Action Plan	X-3
X-2.3 Approach of Formulation of Action Plan.....	X-3
X-2.4 Action Plan Sheet.....	X-3
X-2.4.1 General Information.....	X-5
X-2.4.2 Confirmation on Programs / Sub-programs.....	X-6
X-2.4.3 Implementation Organization	X-8
X-2.4.4 Actions	X-9
X-2.4.5 Schedule.....	X-10
X-2.4.6 Implementation and Monitoring System	X-10
Chapter X-3 FORMULATION OF ACTION PLAN BY PROGRAM	X-14
X-3.1 General.....	X-14
X-3.2 Irrigation Development Sub-program.....	X-15
X-3.2.1 General	X-15
X-3.2.2 Formulation of Action Plan.....	X-15
X-3.3 Backyard Animal Husbandry Sub-program.....	X-19
X-3.3.1 General	X-19
X-3.3.2 Formulation of Action Plan.....	X-20
X-3.4 Market System Development Program.....	X-23
X-3.4.1 Components of Program	X-23
X-3.4.2 Formulation of Action Plan.....	X-24
X-3.5 Extension Strengthening Program	X-28
X-3.5.1 General	X-28
X-3.5.2 Formulation of Action Plan.....	X-31
X-3.6 Farm Road Construction Program	X-34

X-3.6.1	General.....	X-34
X-3.6.2	Formulation of Action Plan.....	X-34
X-3.7	Farm Mule Track Construction Program.....	X-38
X-3.7.1	General.....	X-38
X-3.7.2	Formulation of Action Plan.....	X-38
X-3.8	Light-load Bridge Construction Program.....	X-42
X-3.8.1	General.....	X-42
X-3.8.1	Formulation of Action Plan.....	X-42

List of Attachment

	<u>Page</u>
Attachment X-1 Action Plan Sheet.....	X-A1
Attachment X-2 Action Plans of Priority Gewogs	X-A5

ANNEX-X

GUIDELINE FOR FORMULATION OF THE ACTION PLAN

Chapter X-1 INTRODUCTION

X-1.1 General

This Guideline titled “Guideline for Formulation of Action Plans” (hereinafter referred to as “Guideline”) was prepared by the JICA Study Team in the course of the Study on Agriculture and Farm Road Development in the Lhuntse and Mongar Districts in the Kingdom of Bhutan, which was conducted in accordance with the Scope of Works (S/W) agreed upon between the Ministry of Agriculture (MOA), the Royal Government of Bhutan (RGOB), and the Japan International Cooperation Agency (JICA) on December 11, 2001.

The Study consisted of two stages in the field study period, i.e. master plan stage (April to August, 2002) and action plan stage (September to December, 2002). In the master plan stage, two main plans, namely, Regional Agriculture Development Plan (RADP) and Farm Road Development Plan (FRDP) were formulated aiming at; i) improvement of self-sufficiency of food grains, and ii) improvement of income and living standard, in the Study Area with a target year of 2012. Each plan is composed of four programs as follows:

Regional Agriculture Development Plan (RADP)

- ① Program for Food Crop Production Increase (PFCPI)
- ② Program for Cash Crop Production Strengthening (PCCPS)
- ③ Market System Development Program (MSDP)
- ④ Extension Strengthening Program (ESP)

Farm Road Development Plan (FRDP)

- ① Farm Road Construction Program (FRCP)
- ② Farm Mule Track Construction Program (FMTCP)
- ③ Light-load Bridge Construction Program (LBCP)
- ④ Construction Machinery Center Program (CMCP)

In order to ensure the implementation of these programs, the Study also formulated action plans for priority Gewogs which were selected according to certain criteria from each development stage to cover all the programs above.

Drepong Gewog of Mongar Dzongkhag was selected representing Stage-1 Gewogs which have food shortage problems and the main themes are “to increase food crop production within the area”.

Gangzur Gewog of Lhuntse Dzongkhag was selected representing Stage-2 Gewogs whose food security is mostly maintained and their main development themes are “to improve productivity and stabilize the food supply and to enhance cash income by introducing cash crops along with improvement of access (farm road).

Chaskhar Gewog of Mongar Dzongkhag was selected representing Stage-3 Gewogs which are the most advanced and the main theme of the development is “to improve value of crops through market system development and post-harvest processing”.

Since the above three Gewogs did not include FMTCP and LBCP, Khoma Gewog of Lhuntse Dzongkhag was also selected only for the two programs.

The Study Team worked with MOA, Dzongkhags and the above Gewogs for formulation of the action plans in a participatory planning manner during the action plan stage (September to December 2002). However, beside the three Gewogs, there are 21 Gewogs in the Study Area and they have to formulate their action plans by themselves. Thus, a guideline for formulation of the action plan was prepared for the remaining Gewogs.

X-1.2 Objectives of the Guideline

Taking into the above consideration, objectives of the Guideline are;

- To clarify necessity and role of the action plan, and
- To support each stakeholder (MOA, Dzongkhag, Gewog, beneficiaries) of the proposed programs related to Gewog and beneficiaries in formulation of the action plans, particularly for the 21 Gewogs that were not selected as priority Gewogs.

In order to disseminate the formulation procedure and concept of the Guideline, workshop and seminar were carried out in Lhuntse and Mongar, respectively. The workshop was held with Dzongkhag and priority Gewogs to finalize the action plans, while the seminar was conducted inviting all the Gewogs for dissemination of the Guideline.

X-1.3 Composition of the Guideline

The guideline consists of three parts, namely;

- Chapter X-1: Introduction
- Chapter X-2: Concept of the Action Plan
- Chapter X-3: Action Plan by Program
- Attachment: Action Plans of Priority Gewogs

“Concept of the Action Plan” introduces; i) definition of action plan, ii) component of action plan, iii) concept and approach in formulating of the action plan, and iv) programs for the action plan and related stakeholders.

“Action Plan by Program” introduces usage of “Action Plan Sheet”, which is a form to formulate the action plan. The Action Plan Sheet should be prepared by program or sub-program. “How to fill up and keep it as an authorized action plan” is mentioned here.

“Sample Action Plan” includes the action plans of the priority Gewogs, which were formulated in the action plan stage.

X-1.4 Coverage of the Guideline

In accordance with the objectives, this Guideline contains the procedure of formulation the action plans for programs and sub-programs that are directly related to Gewogs. Since the Program for Cash Crop Production Strengthening (PCCPS) will be handled by MOA itself at RCR RC of Wengkhaz, it is not included in this guideline. The Construction Machinery Center Program (CMCP) which will be undertaken by CMU of MOA is not included, either, because little responsibility or role is confirmed for Gewog or beneficiaries.

Chapter X-2 APPROACH OF FORMULATION OF ACTION PLAN

X-2.1 Definition of Action Plan

Action plan is a detailed plan consisting of: i) identification of stakeholders who should play certain roles in the implementation of proposed projects, ii) clarification of responsibility and role by stakeholder, iii) identification of actions to be taken by stakeholder, iv) setting of time schedule for each action, and v) monitoring and coordination of each action.

Once the action plan is formulated, authorized and kept by all the stakeholders, progress, status and necessary arrangement of the project could be known by all the stakeholders.

X-2.2 Concept of Action Plan

At the end of the development study, certain master plan is formulated. Accordingly, action plans are prepared for each program and sub-program to realize their smooth implementation. Since the various stakeholders are related to those programs, the action plan should be kept by all the stakeholders by program. Therefore, an action plan should include all the necessary information on the program.

For example, the action plan for the “Farm Road Construction Program” of Drepong Gewog of Mongar, should be maintained only for the farm road construction in Drepong Gewog, and be kept by MOA (responsible for construction machinery), Mongar Dzongkhag (responsible for implementation), Drepong Gewog (responsible for labor arrangement), and beneficiaries (Farm Road Users’ Cooperative). These stakeholders can monitor the actions to be taken one another to keep on the program.

X-2.3 Approach of Formulation of Action Plan

(1) Participatory Approach

Since the Action Plan determines responsibility and role of stakeholders, formulation of the Action Plan should be undertaken by getting participation of all the stakeholders. Meeting and discussion should be held in the course of the formulation process in order to share common understanding on the action plan.

(2) Transparency of Formulation Process

Procedures and approaches to formulate the Action Plan should be transparent so that each stakeholder could know clearly the formulation process. For this, certain format and procedure of formulation are required to make modification of the Plan comprehensively. “Action Plan Sheet” was prepared as the format and the procedure to use this sheet is explained in the following section.

X-2.4 Action Plan Sheet

The Action Plan Sheet was prepared in accordance with a flow of formulation of the action plan as shown in the following page.

Participation of all the stakeholders

1 Identification of stakeholders

- 1-1 Specify name of organization related to the program by level of administration (national, Dzongkhag, Gewog, beneficiaries)
- 1-2 Specify name of contact person by stakeholder

2 Confirmation of Programs

- 2-1 Target
- 2-2 Activities
- 2-3 Input
- 2-4 Output
- 2-5 Period
- 2-6 Related programs / sub-programs
- 2-7 Project justification

3 Implementation Setup

- 3-1 Organization chart (organogram) with all the stakeholders
- 3-2 General role and activities of stakeholders

4 Identification of Actions

- 4-1 Identification of actions to be taken for implementation of the projects (time sequent)
- 4-2 Confirmation of detailed activities in the identified action
- 4-3 Confirmation of responsibility of stakeholders by action

5 Scheduling of Actions

- 5-1 Setting of time limit by action
- 5-2 Determination of time frame by action (bar chart)

6 Monitoring System

- 6-1 Progress management (before/after implementation)
- 6-2 Budget management
- 6-3 Meeting
- 6-4 Problem solving
- 6-5 Reporting

7 Confirmation of the Action Plan

- 7-1 Discussion with stakeholders (workshop)
- 7-2 Distribution the action plan sheet to the stakeholders

Flow of Action Plan Formulation

The Action Plan Sheet consists of six major sections as follows:

- General information (title of program / sub-program, stakeholders)
- Program /Sub-programs (target, activities, input, output, period, related program /sub-program, justification),
- Implementation organization (organogram, general roles and responsibility of stakeholders),
- Actions (required actions, responsible stakeholder, detailed activities)
- Schedule of above actions (time limit, bar chart), and
- Implementation and monitoring system (progress management, budget management, meeting, problem solving)

The Action Plan Sheet is given in Attachment-1 of this Guideline. Each item is described in the following sub-section.

X-2.4.1 General Information

(1) Program / sub-program

Title of the program should be written here. Title of the program / sub-program will be chosen from the following:

Program for Food Crop Production Increase

- Food Security Sub-program
- Paddy Rice Production Sub-program
- Irrigation Development Sub-program
- Backyard Animal Husbandry Sub-program
- Post-harvest Technology Training Sub-program

Market System Development Program

- Collection Depot Construction Sub-program
- Group Assembling Sub-program
- Group Assembling and Marketing Sub-program
- Marketing Support Sub-program by FCB

Extension Strengthening Program

- Extension Strengthening for Food Crop Sub-program
- Extension Strengthening for Cash Crop Sub-program

Farm Road Construction Program

Farm Mule Track Construction Program

Light-load Bridge Construction Program

Construction Machinery Center Program

(2) Stakeholder

“Stakeholder” is someone who will be affected by the program, especially someone who contributes the program. As for the proposed programs, government officials at each administrative level (central government, Dzongkhag, Gewog) and beneficiaries should

basically be the stakeholders. On the other hand, someone who is affected by negative impact should also be identified here. Thus the definition of the stakeholder is summarized as follows:

- Someone who will contribute the program directly,
- Someone who will be benefited by the program directly, and
- Someone who will be affected by negative impact of the program directly

Assumed stakeholders of the above programs/sub-programs are as follows:

National level:

- MOA(HQ) / DOR(HQ) / NEC / FCB / Related donors / RNR RC

Dzongkhag level:

- Lhuntse Dzongkhag / Mongar Dzongkhag / DYT / Extension agent / Commission agent

Gewog level:

- Gewog (Gup) / GYT

Beneficiaries level:

- Farmers group / farm road users cooperative / water users association

Contact person of each stakeholder should be specified with contact phone number, if any.

X-2.4.2 Confirmation on Programs / Sub-programs

(1) Target

Target of the program / sub-programs should be mentioned here. The target should be mentioned as concretely as possible with definite figure such as target yield, production, etc.

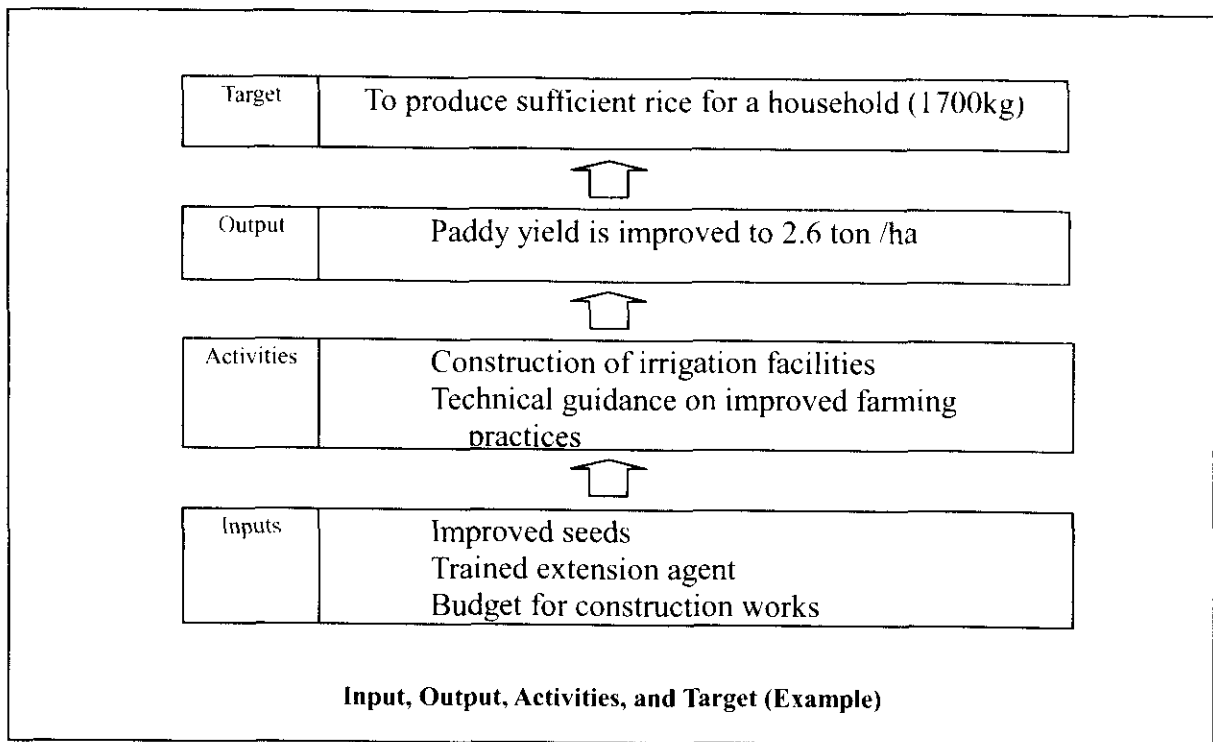
(2) Activities

Actual activities which will be conducted by each stakeholders in the course of the preparation, implementation, operation and maintenance should be specified here. Assumed activities are as follows:

- Engineering services (survey, design, etc.),
- Capacity building (inter-ministerial exchange of staff, training course, workshop, seminar, study tour, etc.),
- Procurement of equipment,
- Construction of facilities,
- Research,
- Extension (farming technology, input supply, etc.),
- Financial arrangement (request for assistance, allocation of budget, etc.),
- Environmental study, and
- Establishment of institutions and organization

(3) Input

“Input” is requirements for performing above mentioned activities. The input generally consists of budget, materials, equipment, machine, land, services and manpower.



(4) Output

“Output” is outcome or product of the above mentioned activities. Only after achievement of the output, the target of the program will be attained. The activities are also considered “how to use the inputs to make for the output”. An example of relationship between the target, output, input, and activities is given in the above figure.

(5) Period

Period should be identified by activity. (ex. survey and design, construction, operation and maintenance). Certain year and month should be mentioned here.

(6) Related Program

Even as an independent program or sub-program, there should be certain interaction between programs or sub-programs. For instance, Construction Machinery Center Program will affect the progress or implementation itself of Farm Road Construction Program. Programs or sub-programs which might be affected, or those which might affect, should be specified here.

(7) Project Justification

Each program or sub-program should be justified in terms of;

(a) Environment

According to the initial environmental examination conducted in the course of the Master Plan Study, it was confirmed that the following issues are to be examined further at preparatory stage of implementation:

Social environment

- Relocation of houses and land expropriation

- Cultural issues (Lhakhang, Chorten, Mani, Khorlo, etc)

Natural environment

- Degradation of flora and fauna
- Soil and land resources (farm road and farm mule track construction)
- Air pollution by construction machinery

It should be mentioned that the activities of the program / sub-program do not affect the environment, or if any, it is within permissible range. Authorization by NEC should be shown in any form here.

(b) Efficiency

Efficiency of a project can be judged with benefit by cost. Particularly for investment for infrastructure, construction cost should be maintained within a reasonable range. Indicative figures per unit of construction (ex. number of beneficiaries per unit, acreage of farm field per unit, etc.) would be given in Chapter 3 for the following programs.

- Light-load Bridge Construction Program
- Farm Mule Track Construction Program
- Farm Road Construction Program
- Market System Development Program

(c) Consistency with Upper Plan/Program

The programs or sub-programs should follow the concept of the upper plan or programs and should support to attain the upper goal. Here it should be judged and mentioned whether the target of the program or sub-program accelerates the performance of the upper plan / program and follow concept of the upper plan / program.

(d) Sustainability

For attaining sustainability of a project, it is important to involve beneficiaries. Involvement of the beneficiaries will be realized with certain incentive and motivation with a sense of ownership among them. Sustainability of a project would indirectly be evaluated by confirming existence of the following activities:

- Participation of beneficiaries,
- Incentive for beneficiaries,
- Capacity building,
- Use of local resources, and
- Reasonable cost or contribution for operation and maintenance

X-2.4.3 Implementation Organization

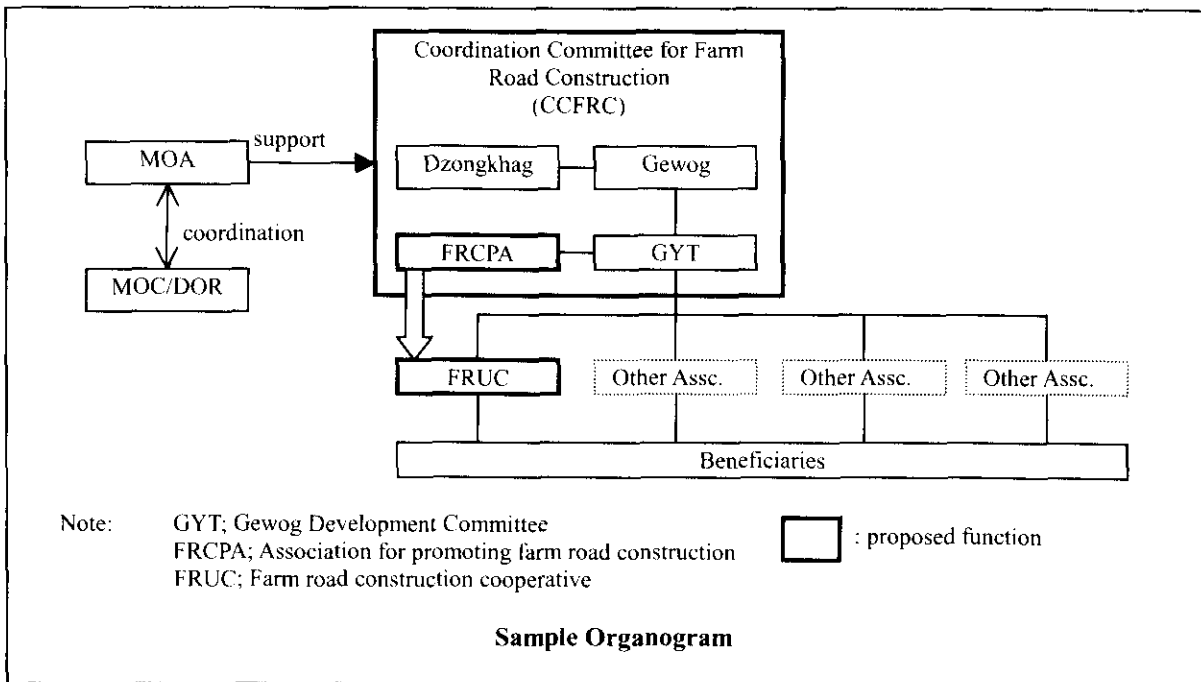
(1) Organogram

Relation ship and roles of all the stakeholders that are identified in the “General Information” should be illustrated in an organogram or conceptual diagram. The organogram should indicate position and inter-relation of each stakeholder as a whole. Existing function and proposed (new) function should be shown clearly. A sample organogram is given in the following page.

(2) General Role and Responsibility

General roles and responsibility of each stakeholder should be described here to explain the

above organogram.



X-2.4.4 Actions

(1) Required Action

All the necessary actions to be taken for realizing implementation and sustainability would be identified here. Actions in general are supposed as follows:

- Establishment of beneficiaries' group,
- Financial arrangement for engineering services such as survey, design, etc.
- Financial arrangement for construction,
- Survey and design,
- Preparatory arrangement for implementation (institutional setup, group formation, orientation, guidance, etc.)
- Implementation (construction, procurement, training, research, extension, etc.),
- Operation and maintenance, and
- Coordination between stakeholders (participation of beneficiaries, inter-ministerial collaboration, etc.)

The actions should be identified in time-sequence. Among these actions, pre-implementation actions should particularly be focused on because such preparatory process will influence the realization of the implementation significantly, in particular, financial arrangement and participation of beneficiaries.

(2) Responsible Stakeholder

In accordance with the required actions, single stakeholder should take the responsibility to perform certain action. Even all the stakeholder should be involved in that action, the responsible stakeholder should coordinate relevant activities by each stakeholder to set the action forward. Basically, one stakeholder should be mentioned here.

(3) Detailed Activities

Concrete measures for achieving of the responsibility should be mentioned here. Abstract expression should not be used as follows:

Abstract and Concrete Expressions	
Abstract expression (×)	Concrete expression (○)
MOA should take necessary action for budget allocation.	→ MOA should request external resources for financing through MOF.
Gewog should make arrangement for implementation.	→ Gewog should arrange labor for the construction work getting guidance from Dzongkhag.
Dzongkhag should support Gewog on design.	→ Dzongkhag should request MOA for design in coordination with DOR.
MOA should allocate an expert.	→ MOA should recruit an environmental specialist from local consultants.
MOA should allocate an expert.	→ 1. MOA should determine TOR of the expert and type of resources (foreign, local) 2. MOA should recruit the expert determined above

Concrete activity should be mentioned with “HOW”, i.e. procedure to carry out the action, because “how to perform the action” is the most important and necessary description to be written here. If the several alternatives are considered for the action, specify the alternatives or add one process (action) before that to select the alternative.

X-2.4.5 Schedule

(1) Required Action

The required action here should coincide with those of “IV Actions”.

(2) Period

Period during which the above actions would be performed should be written.

(3) Schedule

The above period should be shown as “bar chart” on the sheet.

X-2.4.6 Implementation and Monitoring System

Implementation and monitoring system is indispensable to realize implementation and output of the program. Implementation of the authorized action plan and monitoring of the progress and process of the implementation should be conducted systematically and comprehensively so that each stakeholder could take his responsible action at right time. For this, five components, namely; i) progress management, ii) budget management, iii) meeting, iv) problem solving, and v) reporting are to be confirmed.

(1) Progress Management

“Progress management” is not only for implementation but for the action plan itself. After completion and authorization of the action plan, the progress management should be started.

1) WHO

Responsible stakeholder of the progress management should be basically

“implementation body” of program or sub-program or the highest administration among the stakeholders, because overall management and coordination can be undertaken only from the top management.

2) WHEN

The progress management should be undertaken through monitoring of the progress by the responsible stakeholder (WHO). Frequency or timing of the monitoring should be mentioned. The monitoring should be started immediately after the authorization of the action plan in accordance with the timing mentioned here.

3) WHERE

Location of progress management should be mentioned here. Not only name of Dzongkhag, Gewog or village but also venue should be specified.

4) HOW

Activities to confirm the progress should be mentioned. Certain meeting, discussion, reporting, site visit, hearing, etc. should be the activities to monitor the progress. Even without establishing of a new monitoring setup, existing meeting could be utilized for the purpose. (ex. as an agenda of DYT meeting).

(2) Budget Management

“Budget management” would consist of the following activities:

- Arrangement of budget for realization of implementation of the program,
- Budget management at implementation stage, and
- Budget management at operation and maintenance stage.

(a) Budget Management at Preparation Stage

1) WHO

Responsible organization to arrange budget which is necessary for implementation of the program.

2) WHEN

Timing to confirm or check if the budget allocation is done or not. In general, the confirmation can be done after certain period of appraisal of the request. The timing should be confirmed when the budget is requested.

3) WHERE

Organization to be inquired on the budget allocation of the program. The organization and person in charge that received the request would be specified.

4) HOW

How to inquire on the arrangement of the budget. It is preferable to inquire on written format in order to explain to the stakeholders.

(b) Budget Management at Implementation Stage

1) WHO

Implementation organization should be regarded as the responsible stakeholder. Account, treasurer, chief of the implementation body or position title should be specified.

2) WHEN

Timing of budgetary arrangement, interval of account checking, timing of modification of budget and request, etc.

3) WHERE

Place of the budget to be kept. Where meeting on the budget management is held. Where the person in charge will station.

4) HOW

System of budget management. How to disburse the budget and how to check the expenditure.

(b) Budget Management at O&M Stage

1) WHO

O&M organization should be the responsible on management of budget.

2) WHEN

Closing and checking date or frequency of O&M budget. When should the budget for O&M collected or allocated.

3) WHERE

From where should O&M budget be collected or allocated.

4) HOW

How should budget for O&M be collected or allocated. Procedure of collecting or allocation from the person or organization specified at "WHERE".

(3) Problem Solving

In the course of implementation of the action plan, various problems might happen, which will hamper smooth implementation. In particular, actions at initial stage such as budget allocation, agreement between implementation body and beneficiaries, group formation should be carefully monitored. Problems assumed at each stage of the action plan are as follows:

- Budget arrangement (no budget to be allocated, shortage of budget, etc.),
- Technical problems (design, construction, O&M),
- Accident (injury, death at construction stage),

- Participation (less contribution, failure in formation of group, poor group activity),
- Manpower (lack of manpower, transfer or change of personnel, capacity)
- Dispute (among beneficiaries, between beneficiaries and non-beneficiaries)

1) WHO

Responsible stakeholder is to take initiative in problem solving. At any stage, implementation body of the project should be the responsible stakeholder. However, taking communication with the ministries into account, MOA or Dzongkhag should be responsible for the problems on budget allocation.

2) WHEN

In case the responsible organization in problem solving identify problems either by itself or by any other stakeholder, it should take action immediately. The responsible stakeholder can call for all the stakeholders to discuss and solve the problem.

3) WHERE

Procedure of the problem solving should be discussed in the meeting. Venue should be determined according to the stakeholders related to the problems. The third party should attend the meeting.

4) HOW

Problems should be solved through due discussion with the related stakeholders. Necessary actions to solve the problem should be discussed first, then, roles of each stakeholder to take the actions should be decided. As for dispute, existing problem solving procedure should be adopted. The third party of the problem should attend the problem solving meeting as an arbitrator and minutes of meeting with signature of persons concerned and the arbitrator should be kept.

Chapter X-3 FORMULATION OF ACTION PLAN BY PROGRAM

X-3.1 General

In accordance with the general procedure to formulate the Action Plan or to fill up the Action Plan Sheet with necessary information, each program or sub-program directly related to Gewog is considered in this Chapter. Out of eight programs and 15 sub-programs of the Master Plan, the following programs and sub-programs directly related to Gewog were selected for detailed explanation.

List of Program and Sub-program Related to Gewog

Plan / Program / Sub-program		Responsibility of Stakeholders				Guide-line
		MOA	Dzong-khag		Farmer Individual	
REGIONAL AGRICULTURE DEVELOPMENT PLAN (RADP)						
P1: Program for Food Crop Production Increase						
P1-SP1	Food Security SP		⊙			×
P1-SP2	Paddy-rice Production SP		⊙			×
P1-SP3	Irrigation Development SP		△	●	○	●(3.2)
P1-SP4	Backyard Animal Husbandry SP		⊙	●	○	●(3.3)
P1-SP5	Post-harvest Technology Training SP		⊙			×
P2: Program for Cash Crop Production Strengthening						
P2-SP1	Market Research SP	⊙	○			×
P2-SP2	Technical Research and Development SP	⊙	○			×
P2-SP3	Training of Extension Agent SP	⊙	○			×
P2-SP4	Agro-processing Technology Training SP	⊙			○	×
P3: Market System Development Program						
P3-SP1	Collection Depot Construction SP		○	●	○	●(3.4)
P3-SP2	Group Assembling SP		△	●	○	●(3.4)
P3-SP3	Group Assembling and Marketing SP		△	●	○	●(3.4)
P3-SP4	Marketing Support SP by FCB	⊙	△			×
P4: Extension Strengthening Program						
P4-SP1	Extension Strengthening for Food Crop SP	△	○	●	○	●(3.5)
P4-SP2	Extension Strengthening for Cash Crop SP	△	○	●	○	●(3.5)
FARM ROAD DEVELOPMENT PLAN (FRDP)						
P1: Farm Road Construction Program		○	⊙	●	○	●(3.6)
P2: Farm Mule Track Construction Program			⊙	●	○	●(3.7)
P3: Light-load Bridge Construction Program			⊙	●	○	●(3.8)
P4: Construction Machinery Center Program		⊙				×

Note: ⊙: Mainly responsible, ○: Responsible, △: Support, ●(?.?): Included (Section No.), ×: Not included

X-3.2 Irrigation Development Sub-program

X-3.2.1 General

The action plan is divided into two programs as follows;

(1) Rehabilitation Program

This is a rehabilitation program for the existing irrigation facilities requested by the existing WUA.

(2) Proposed Program

A WUA is officially established and irrigation facilities are newly constructed by the established WUA.

Both programs will be basically implemented in accordance with the National Irrigation Policy Procedural Manual (Module 1 to Module 9) formulated by MOA. Therefore the details to be described in the Action Plan Sheet will be cited referring to the contents and forms instructed in the Manual.

X-3.2.2 Formulation of Action Plan

(1) Program/ sub-program

Refer to Sub-section *X-2.4.1 General Information (1)*.

(2) Stakeholders

Refer to Sub-section *X-2.4.1 General Information (2)* and *Organization/Name and Contact Person* will be described in the Action Plan Sheet by *Level* referring to the following information.

(a) National Level

MOA is the object and the most influential department in MOA to the program will be selected, then *Contact Person* will be the head of its department. In this program, DRDS and its head is the object.

(b) Dzongkhag Level

Dzongkhag Engineering Office and Agricultural Office to be the target Gewog of the program is the object. DE/ DAO will be generally selected as a *Contact Person* since DE/DAO is mainly concerned in the arrangement on national irrigation policy procedure at any stages.

(c) Gewog Level

GYT is the object as it has a right of decision for the Gewog development plan. Gup will be generally selected as a *Contact Person* since Gup is the responsible person in GYT.

(d) Beneficiaries Level

In *Proposed Program*, as WUA is not established at the initial stage, tentative WUA will be

composed by someone who will be benefited by the program. Therefore tentative WUA is the object and it is preferable that *Contact Person* will be selected from GYT members since WUA is not established yet at the initial stage as well. In Rehabilitation Program, automatically the existing WUA is selected and *Contact Person* is also the Chairman of the WUA.

(3) Target

Irrigated area will be described in the Action Plan Sheet as the *Target*.

(4) Activities

The items to be described as the *Activities* in the Action Plan Sheet will be basically cited referring to the *Activities* described in Sub-section X-2.4.2 *Confirmation on Programs/Sub-programs (2)*. The following items are considered in this program.

- Survey, Plan (Rehabilitation), Design (Proposed) and Cost Estimation
- Capacity building (basically for Proposed one)
- Rehabilitation of irrigation facilities (Rehabilitation)
- Construction of irrigation facilities (Proposed)
- Maintenance by WUA
- Procurement of construction materials and tools
- Financial arrangement
- Establishment of organization (Proposed)

(5) Input

Though this is also described in the Action Plan Sheet on the basis of the instruction of the *Input* described in Sub-section X-2.4.2 *Confirmation on Programs/Sub-programs (3)*, the following items are considered in this program.

- Surveyor
- Irrigation Engineer for Rehabilitation Plan (Rehabilitation)
- Irrigation Engineer for Design (Proposed)
- Irrigation Engineer for Supervision
- Construction Materials and Tools
- Skilled Labor
- Unskilled Labor
- Maintenance by WUA
- Project Cost

(6) Output

Canal length to be rehabilitated or newly constructed will be described, additionally the other facilities to be rehabilitated or newly constructed other than the canal will be concretely described as much as possible. Also water management improvement will be an *Output* as the irrigation system will be improved with its rehabilitation or construction.

(7) Period

In consideration of the necessary time of each identified activity, the *Period* will be described in the Action Plan Sheet at least regarding survey and design (Proposed) or plan (Rehabilitation), construction, rehabilitation and maintenance. The maintenance period will be described in the mark (~, from when).

(8) Related Program

Though this is also described in the Action Plan Sheet on the basis of the instruction of *Related Program* described in Sub-section X-2.4.2 *Confirmation on Programs/ Sub-programs (6)* and Sub-section X-2.4.1 *General Information (1)*, the following programs are considered in this program.

- Program for Food Crop Production Increase/ Food Security SP, Paddy Rice Production SP, Post-harvest Technology Training SP
- Extension Strengthening Program/ Extension Strengthening for Food Crop SP

(9) Project Justification

Project justification will be described in the Action Plan Sheet by environment, efficiency, consistency and sustainability, the following items are considered and described its situation or evaluation in this program.

(a) Environment

Situation of IEE, necessity of further environmental assessment and authorization issuance of NEC.

(b) Efficiency

Reasonable range of construction unit cost or rehabilitation unit cost for canal per km estimated based on the budget in 9th FYP is as follows;

- Rehabilitation: Nu 132,000/km, Proposed: Nu. 300,000/km

(c) Consistency

In consideration of the upper plans and programs, this is described that this program is linked with Program for Food Crop Production Increase

(d) Sustainability

In accordance with the instructions described in the Procedural Manual, it will be confirmed and described in the Action Plan Sheet regarding the participation and maintenance contribution fund and so on.

(10) Organization Chart

This is illustrated in consideration of not only the existing organizations from national level to beneficiaries' level but also proposed organizations (new) with their functions on the basis of the Gewog development plan discussed in GYT. Therefore MOA, Dzongkhag, DYT, Gewog, GYT, WUA, Beneficiaries and proposed organizations will be illustrated in the Organization Chart.

(11) General Role and Responsibility

This is described in the Action Plan Sheet by each stakeholder level (National, Dzongkhag, Gewog and Beneficiaries). In this program, DRDS, MOA at National level, Dzongkhag Engineering/Agriculture Office at Dzongkhag level, GYT at Gewog level and WUA at Beneficiaries level are described in the Action Plan Sheet.

(12) Action Plan

(a) Required Action

As aforementioned above, the program will be basically implemented in accordance with the National Irrigation Policy Procedural Manual (Module 1 to Module 9) formulated by MOA. Though required actions in general are indicated in Sub-section X-2.4.4 *Actions (1)*, actual required actions for the program will be officially formulated based on the Procedural Manual taking account of required actions in general and specific required action, if any. In particular, financial arrangement and participation of beneficiaries to be deemed as the required actions shall be itemized and described in the Action Plan Sheet.

(b) Responsible Stakeholder

Responsible stakeholder will be basically described to select from the certain organizations illustrated in the organization chart by itemized required actions taking account of each required action. Additionally it is preferable that the function of MOF will be described in the detailed activities of the Action Plan Sheet in the required action relating to the function of financial arrangement.

(c) Detailed Activities

Detailed activities being instructed in the Procedural Manual will be briefly described to modify its content in the Action Plan Sheet, then the FORM number of the form used in the Action Plan should be written for reference. It is preferable that the relation between the stakeholder and the required activity are clearly and concretely described in the Action Plan Sheet.

(13) Schedule

(a) Required Action

This is automatically converted from the required actions itemized in (12) *Action Plan*.

(b) Period and Schedule

Period will be described in year and month of Christian Year in consideration of the necessary time for each required action in consultation with Dzongkhag especially with Engineering Office, then its fixed period will be shown in bar chart as it is described in Sub-section X-2.4.5 *Schedule (3)*.

(c) Implementation and Monitoring System

In this program, the following plan will be considered taking account of the existing system and the Procedural Manual for the time being, however the plan will be modified on the basis of the current situation and system.

(d) Progress Management

<u>Who:</u>	DE/DAO, Dzongkhag of planned Gewog
<u>When:</u>	Every three months
<u>Where:</u>	Dzongkhag Engineering/Agriculture Office of planned Gewog
<u>How:</u>	Quarterly report prepared by Dzongkhag engineer (DE)

(e) Budget Management

1) At Preparatory Stage

Who: Superintending Engineer, DRDS, MOA
When: Every Financial Year
Where: MOA Office, Thimphu
How: As per Financial Manual of RGOB

2) At Implementation Stage

Who: DAO, Dzongkhag of planned Gewog
When: Monthly basis
Where: Dzongkhag Agriculture Office of planned Gewog
How: As per Financial Manual of RGOB

3) At O & M Stage

Who: Chairperson, WUA
When: Monthly basis
Where: Accountant, WUA
How: Constitution/Bylaws enacted in WUA

4) Problem Solving:

Who

- Budget arrangement: Superintending Engineer, DRDS, MOA at preparatory stage/ DAO, Dzongkhag at implementation stage/ Chairperson, WUA at O&M stage,
- Technical problems: DE, Dzongkhag,
- Accident • Participation • Dispute: Chairperson, WUA,
- Manpower: Superintending Engineer, DRDS, MOA,

When: As the problems happened

Where

- Budget arrangement: DRDS, MOA at preparatory stage and implementation stage/ WUA at O&M stage,
- Technical problems: Dzongkhag Engineering Office
- Accident • Participation • Dispute: WUA Office
- Manpower: DRDS, MOA

How

- Budget arrangement: DRDS, MOA discusses with MOF at preparatory stage and implementation stage/ WUA discusses among the beneficiaries at O&M stage,
- Technical problems: Dzongkhag Engineering explains the countermeasures to the beneficiaries,
- Accident • Participation • Dispute: WUA discusses among the beneficiaries and third party, and
- Manpower: DRDS, MOA discusses with the organization concerned

X-3.3 Backyard Animal Husbandry Sub-program

X-3.3.1 General

This sub-program aims at income increase and nutritious improvement of rural people through backyard animal husbandry (pig and poultry) using surplus cereals and by-products

of home processing (oil cake, liquor lees, bran, etc.). Major activities of the sub-program consist of:

- ① Training of livestock-EA by Dzongkhag,
- ② Breeding of pig and chicken by PPBC (Piggery and Poultry Breeding Center) located in Lingmithang,
- ③ Preparation of livestock development plan,
- ④ Distribution of piglet and chick to farmers,
- ⑤ Strengthening of extension activities for animal husbandry through Farmers Field School (FFS), Demonstration Farm and Farmers Study Tour (FST), and
- ⑥ Encouragement of pig breeder farmers in Gewog.

Out of the above activities, the last four activities (③ - ⑥) will be carried out by EA in cooperation with proposed Livestock Working Group under Gup. Livestock Working Group consisting of several members (2 – 3) should be established in association with GYT for strengthening of an administrative function of Gewog, farmers participation to community activities, and assistance / coordination of EA's activities.

This guideline describes on Gewog activities excluding those of Dzongkhag and PPBC.

X-3.3.2 Formulation of Action Plan

(1) Stakeholders

Stakeholders should be clarified through examination of role, responsibility and relations with the sub-program. Responsible stakeholders should be Gup at Gewog level, and DAHO at Dzongkhag level. EAs stationed in Gewog should support the activities of Gup and Livestock Working Group. *Implementation Organization (III)* of the Action Plan Sheet should be referred.

(2) Target of Sub-program

Target should be described in total numbers of animals, percentage of rearing households and average numbers of animals per household. Numbers of animals at the target year should be examined carefully based on the present condition, ratio of rearing households, rearing numbers per household, availability of breeding, availability of animal feed, and demand / market in and around the Gewog. The procedures of target setting and development plan are shown in the following table:

A Sample of Plan on Backyard Animal Husbandry					
	Nos. of animals	% of rearing hh	Average nos./hh	Nos. of hh ^{*2}	Remarks
Pig					
Present ^{*1}	330	52%	0.8	401	
Target (2012)	620	60%	1.2	510	
Chicken					
Present ^{*1}	1290	75%	3.2	401	
Target (2012)	3050	85%	6.0	510	

Note ^{*1}: Figures of present condition of Gewog are available in RNR center and RNR Statistic 2000.

^{*2}: Nos. of households in target year (2012) is estimated at 128% of present (annual increase rate of population: 2.5%).

Sample of Income Increase per Household by Backyard Animal Husbandry

	Average nos. of animals per hh	Production value (Nu./animal/year)	Production value (Nu./hh)	Remarks
Pig				
Present	0.8	4500 *1	3600	Live pig for meat and piglet
Target (2012)	1.2	6400 *1	7680	
Chicken				
Present	3.2	200 *2	640	Egg and live chicken for meat
Target (2012)	6.0	250 *2	1500	

Note *1: Present: Live pig for meat = 120 kg /3 years x Nu.50/kg = Nu.2,000/year/head
Piglet = 5 head/year x Nu.1000 / 50% male = Nu.2,500, Total : Nu.4,500/year
Proposed: Live pig = 120 kg/2.5 years x Nu.50/kg = Nu.2,400/year/head
Piglet = 8 head/year x Nu.1000 / 50% male = Nu.4,000, Total : Nu.6,400/year
*2: Present: Live chicken for meat = 2.0 kg x Nu.50/kg/2 years = Nu.50/year/head
Egg: 60 egg/year x Nu.2.5 = Nu 150, Total: Nu.200/year
Proposed Live chicken for meat = 2.0 kg x Nu.50/kg/2 years = Nu.50/head
Egg: 80 egg/year x Nu.2.5 = Nu 200/head, Total Nu.250/year

(3) Activities

Specify required activities referring to the following contents. This sub-program includes activities of Dzongkhag and Gewog. *Activities* of the sub-program are shown below:

- EA training on backyard animal husbandry promotion,
- Establishment of Livestock Working Group in Gewog,
- Preparation of backyard animal promotion plan including extension service and input distribution,
- Request of budget allocation for the activities if necessary,
- Distribution of piglets and chicks,
- Carrying out Farmers Field School (FFS) and operation of Demonstration Farm.

(4) Input

Required quantity of subsidized piglet and chick for distribution to farmers should be written here based on the backyard animal promotion plan. Trainers (DAHO and extension officials of MOA or RNR Centers) could be the required manpower. Assumed budget allocation for the activities should be specified (Dzongkhag budget, MOA budget).

(5) Output

The anticipated outputs would be as follows:

- Backyard animal husbandry is activated in Gewog
- Income increase of farm households (Prospective income per household should be written here referring below table)
- Rural people are improved in notorious condition,
- Good FYM is provided using animal dung,
- Surplus maize is used value-adding production through animal husbandry,
- Livestock productivity and animal health are improved through improvement of feeding and animal shed, and
- Livestock Working Group is encouraged through joint working with EA, and farmers are involved in extension activities.

(6) Period

The promotion plan should be prepared by the end of 2003 for the budget arrangement. Distribution of animals, extension activities of FFS and Demonstration Farm will be implemented from July in 2004.

(7) Related Program

Food Security Sub-program may be related with Food Security Sub-program in relation with availability of surplus cereals and by-products of home processing.

(8) Project Justification

Results of following justification should be written here:

(a) Environment

Little environmental impact may occur by the activities of this sub-program.

(b) Efficiency

Input is mostly procured by use of existing resources such as Dzongkhag officials, bi-products, surplus. In this sense, efficiency is quite high.

(c) Consistency with Upper Plan

Farmers will get more income through backyard animal husbandry.

(d) Sustainability

The sub-program includes capacity building of EA and Livestock Working Group, and farmers through the extension activities.

(9) Implementation Organization

The sub-program in Gewog should be carried out by Gup and Livestock Working Group in cooperation with EAs. DAHO should coordinate and support through EAs. EAs are the responsible person for livestock extension activities in Gewog.

(10) Actions

Actions of this sub-program which should be undertaken at Gewog level are as follows:

- Organizing of Livestock Working Group (Gup / GYT),
- Request for budget allocation for animal distribution (Gup),
- Distribution of subsidized piglet and chick (Gup, Livestock Working Group),
- Implementation of demonstration livestock farm (EA and Livestock Working Group)
- Implementation of FFS (EA and Livestock Working Group)

(11) Schedule

Schedule should be written in the same sequence as the above with *Required Actions* and *Periods* (calendar date and illustrated period) in the Action Plan Sheet.

(12) Implementation and Monitoring System

Responsible person of implementation and monitoring at Gewog level activity should be Gup. Gup should submit the progress / monitoring report and budget plan to DAHO. DAHO take responsible in Dzongkhag level.

X-3.4 Market System Development Program

X-3.4.1 Components of Program

Market System Development Program consists of four sub-programs, namely, Collection Depot Construction Sub-program, Group Assembling Sub-program, Group Assembling and Marketing Sub-program and Sub-program for Marketing Support by FCB. Since Marketing Support Sub-program will be carried out by FCB, remaining three sub-programs that will be implemented by farmers in Gewog level are the subjects for this Guideline.

The aim of three sub-programs is mutually to expand marketing capacity of farmers and ensure the income increase. Their expected activities are closely related to each other showing the table below:

Sub-programs and Related Activities		
Code	Sub-program	Relation of Activity
SP1	Collection Depot Construction	Provision of collection depot where farmers group activities promoted by SP2 and 3 will be realized.
SP2	Group Assembling	Provision of group assembling and sales activity among farmers using collection depot constructed by SP1.
SP3	Group Assembling and Marketing	Provision of more sophisticated and profitable activity based on activity by SP2.

Therefore it is practical that the action plan for these sub-programs shall be considered together and prepared in one Action Plan Sheet.

On the other hand, these sub-programs aim at the shipment by truck and cannot be applied to Gewogs without any motorable road. And existing shed markets in some Gewogs will be used for collection depots without construction of new depots. Such application condition to each Gewog is different and clarified in the following table.

Related Program by Gewog				
Gewogs	SP1	SP2	SP3	
Gangzur , Drametse, Mongar, Ngatshang, Saleng	-	○	○	
Menbi, Minjay, Tsenkhar, Balam, Chali, Chaskhar , Serimuhang, Tsakaling	○	○	○	
Kurtoe, Metsho, Drepong , Thangrong	○	○	-	
Jaray, Khoma, Gongdue, Jurme, Kengkhar, Silambi, Tsamang	-	-	-	

The Action Plan Sheets prepared for three priority Gewogs are shown in Attachment for reference. As for the priority Gewogs indicated by bold letters in the above table, they are fortunately placed each in the three classified groups. Therefore, each Action Plan Sheet will be very practical sample for formulating the Action Plan Sheets for other Gewogs in the same group.

Additionally, the remote seven Gewogs are not applicable to the Programs for the sake of convenience because of no expectation of motorable road construction during the project period. However, it is recommendable that Gewog will also promote farmers group formation to let them transport their products to the nearest shed market or depot in the neighboring

Gewog, after agreement of their participation from farmers group and Gewog concerned. The farm mule track that will be constructed in the Farm Mule Track Construction Program will be effective for this activity. For example, the farmers group in Khoma may join to the group assembling activity in Gangzur or Menbi.

To formulate the Action Plan Sheet, the issues which require due attention and consideration for Market System Development Program in addition to the general guidance in Section X-2.4 are mentioned in the following Sub-section.

X-3.4.2 Formulation of Action Plan

The formulation work will be carried out by the following guidance and referring to the Action Plan Sheet of the priority Gewogs in the same group of the applicable condition.

(1) Stakeholders

Stakeholders shall be clarified and decided together with the general role and responsibility in *III (b)* while detailed actions should be specified in *IV*. Listed names of organization shown in the attached Action Plan Sheets in Attachment would be valid selection.

(2) Target

Target and output of the program shall be illustrated. As explained in Sub-section 2.4.2, the target can only be derived from output as the outcome of the planned activity. Therefore, the target derived from the output expectation (Refer to (4)) shall be shown with the quantity of the annual handling products and the expected sales amount calculated roughly by Nu./kg of a current average price per kg of fruits and vegetables at the auction

(3) Activities and inputs

The contents of activities and inputs formulated and shown in the Action Plan Sheets in Attachment will be reviewed and improved if necessary.

The activities being necessary for any application condition are as follows:

- Organizing farmers group
- Forming leaders
- Bringing the products to the depot/market by each member farmer
- Promotion of the better condition for selling products by the leader
- Carrying out the transaction between buyers and farmers in a depot/market.

In addition to above, the activities required for SP1 and SP3 are as follows.

For SP1:

- Construction of a depot beside the farm road.

For SP3:

- Strengthening ability of the leaders.
- Collection and analysis of market information
- Transporting and selling at local markets or at the auction market in Samdrup Jongkhar
- Storing some products once and shipping later watching market condition

Regarding the input, same condition is expected.

The general inputs are as follows:

- Provision of trainers of group activity, fostering leaders, business management, and quality control

For SP1:

- Provision of construction materials for a depot

For SP3:

- Provision of market information
- Provision of trainers of management and marketing, and information collection and analysis

(4) Output

The suitable indices for showing the output of the program together with the achievement milestone for monitoring the program implementation are introduced as follows.

Output of Program		
Index	Contents	Indicator
Participation number of household	Expected possible participation number of farm household to the group activities provided by the program.	Number of farm households
Handling Quantity	Expected handling quantity of products by the group activity among planned total marketable cash crop production given by the Program for Cash Crop Production Strengthening. It will be closely related to the above number of households.	Tons

These indices for target and output shall be discussed and considered well among all people concerned such as Gup, EAs, members of proposed marketing working group of GYT and representatives of farmers after full understanding of all activities to be implemented by the program. Actually, the participation rate (%) of farm household among all households in the Gewog shall be expected, estimated and decided to identify the target number of households, because it will be automatically estimated from the rate and all numbers of households. Additionally, following the participation rate the target handling quantity shall be estimated from the marketable production in 2012 planned and estimated by the “Program for Cash Crop Production Strengthening”. The handling rate among all marketable production shall be same to or just less than the participation rate. The planned marketable production figures in each Gewog are shown in the following table.

Marketable Production Plan in Each Gewog (2012)

				(ton)			
Lhuntse	Vegetable	Fruits	Total	Mongar	Vegetable	Fruits	Total
Gangzur	689	424	1,113	Balam	163	115	278
Jaray	65	1	65	Chali	550	284	834
Khoma	291	98	388	Chaskhar	842	382	1,224
Kurtoe	180	102	282	Drametse	1,442	588	2,030
Menbi	729	263	992	Drepong	260	179	440
Metsho	220	132	352	Gongdue	100	294	394
Minjay	239	289	528	Jurme	78	221	299
Tsenkhar	363	253	616	Kengkhar	115	124	239
				Mongar	968	332	1,300
				Ngatshang	563	266	829
				Saleng	440	359	799
				Serimuhung	404	213	616
				Silambi	93	61	154
				Thangrong	411	139	550
				Tsakaling	697	288	985
				Tsamang	279	264	543

Anyhow the expected possible figures shall be decided by the mutual consensus incubated among participants above. Therefore, the figures of target and output will differ between Gewogs. Actually, the figures that the Study Team confirmed with the people concerned in three priority Gewogs were different to each other.

(5) Period

Implementation period shall be indicated after preparation of schedule of each action in V. The starting period will differ from the farm road construction schedule and other local condition. Therefore, indication of the year for a depot construction and/or for starting activities will be enough.

(6) Project justification

(a) Environment

There is no major impact to environment by implementation of these Sub-programs.

(b) Efficiency

The contents of project justification prepared and shown in the Action Plan Sheet in Attachment will be reviewed, improved and added the concluded target figures by due consideration with the matters described below.

For the project justification in view of publicity and economy, it is desirable that target figure will be over the minimum requirement as follows:

- Expected participation households: 70 numbers (that can provide about 140 tons of marketable products annually, minimum justifiable quantity handled in a depot).

The action plan that cannot cover the minimum requirement figure above will be reconsidered for improvement of activities efficiency.

(c) Consistency with Upper Plan/Program

These sub-programs are indispensable to ensure income increase of farmers as the upper goal.

(d) Sustainability

It is important to create the market-oriented mindset among farmers especially leaders through training, and activities in the programs are important for sustainability of marketing activities carried out by them.

(7) Organization chart

The organization chart in the Action Plan Sheet in Attachment that was prepared after discussion and confirmation in the workshop and individual meetings with Gup, EAs and peoples concerned in Gewogs is generally applied to any Gewog. It may be improved more practically, especially if special local condition will exists.

(8) General role and responsibility of stakeholders

As same as (1) *Stakeholders*, it shall be considered and prepared based on the sequential detailed action plan.

(9) Action plan (sequent)

The action plan shown in the Action Plan Sheet in Attachment covers all required actions. Reviewing the contents of actions and supposing the actual implementation condition in the future, the required actions shall be discussed, confirmed and clarified among more people concerned as possible in Gewog. As a result, required actions may be improved and added, responsible stakeholder may be changed and/or description of activities may be improved to be more practical and detailed.

The actions being necessary for any application condition are as follows:

- Training to EAs and Gewog staffs
- Promotion of organizing farmers
- Fostering leaders
- Training of leaders (1)
- Sales promotion
- Group shipment
- Training leaders (2)
- Grading activity

In addition to above, the activities required for SP1 and SP3 are as follows.

For SP1:

- Request of depot construction materials
- Budget allocation
- Decision of construction place of a depot
- Provision of construction materials
- Construction of a depot

For SP3:

- Provision of market information
- Direct sale activity

(10) Schedule

The schedule chart in the Action Plan Sheet in Attachment is prepared by specific condition for the certain Gewog. Since all Gewogs will not start on the same year as some Gewogs will start the implementation after farm road construction, the practical implementation schedule shall be considered and drawn in the calendar table based on sequential actions expected.

(11) Implementation and monitoring system

Based on the general content in the Action Plan Sheet in Attachment, the table shall be filled up according to the general guidance in Sub-section X-2.4.6.

X-3.5 Extension Strengthening Program

X-3.5.1 General

(1) EAs and Working Groups in Gewog

Action plan of this program shows extension activities and preparation of crop production plan in Gewog level involving Gewog people. The program consists of two sub-programs, namely, food crop and cash crop. The activities are implemented by EA in charge of agriculture in cooperation with Working Groups for Food Crop and Cash Crop in Gewog. EAs will be trained on crop management, survey and analysis of present situation / development potential, preparation of production plan, and improvement of extension system by the following sub-programs:

- “Food Security Sub-program” of Program for Food Crop Production Increase (P1-SP1), and
- “Training of Extension Agent Sub-program” of Program for Cash Crop Production Strengthening (P2-SP3).

The Working Groups consisting of several members (2 - 4) will be established in association with GYT for strengthening of an administrative function of Gewog, and assistance / coordination of EA's activities.

(2) Preparation of Production Plan and Target Setting

(a) Land use plan

Land use plan should be prepared based on the present condition and development plan of land. A sample of the plan is shown below:

A Sample on Land Use Plan of Farmland

(Unit: ha)

Land Use	Present *1	Proposed (2012)	Remarks
Wet land	234	243	From dry land: +12 To school construction: -3 Difference: +9
Dry land	567	587	From Tseri: +34 To wet land: -12 To road construction: -2 Difference: +20
Tseri	321	179	To dry land: -34 To orchard: -18 To: pasture: -56 To: forest: -34 Difference: -142
Kitchen Garden	12	12	Difference: 0
Total	1134	1021	Difference: -113

Note *1: Farmland area at present is estimated based on the planted area and Land Cover Map.

Farmland area at present conditions is available in; i) Land Registration Record of Gewog, ii) RNR Statistics 2000, and iii) Land Cover Map prepared by PPD, MOA. Land Registration and RNR Statistics might be much smaller than actual land area. Because the area will be basic information for taxation on land owned and people normally declare it smaller. Due to the less estimated area mentioned above, average unit yields are considerably higher than the actual yields. The actual land area can be estimated by; i) sample survey of farmland area, or ii) estimation by the Land Cover Map and planted areas by crops.

(b) Cereal production plan

Cereal production plan will be prepared based on the present production and potential of the increase. Present planted area shown in the following table was estimated from production of each crop in RNR Statistics 2000 and yields were estimated at 2.2 ton/ha for paddy, 2.0 ton/ha for maize, and 1.0 ton/ha for other cereal crops. Prospective production should be examined carefully according to the potential survey of land, available labor force for farming, anticipated yield level by dissemination of improved crop management, expansion of HYVs, improvement of irrigation facility, and double cropping after harvest of summer crops.

Table A Sample of Production Plan on Food Crop

	Present			Proposed (2012)			Remarks
	Area *1 (ha)	Yield *2 (ton/ha)	Production *3 (ton)	Area (ha)	Yield (ton/ha)	Production (ton)	
Paddy	211	2.2	464	240	2.6	628	Rehabilitation of irrigation facilities
Maize	432	2.0	864	500	2.2	1100	
Wheat	18	1.0	18	22	1.2	26	Mainly double cropping after maize
Barley	8	1.0	8	13	1.1	14	
Millet	2	1.0	2	2	1.1	2	
Buckwheat	6	1.0	6	6	1.1	7	
Total	777		1362	905		1777	

Note *1: Planted areas are estimated from productions and average unit yields

*2: Average unit yields are estimated by the Study Team

*3: Productions of cereal by Gewogs are available in RNR Statistics 2000.

(c) Estimation of food sufficiency level

Target of the sub-program is to improve / maintain food sufficiency, and to improve production efficiency of food crop. Food sufficiency level was estimated at 200 - 230 kg per capita of milled grain through examination of present situation based on "RNR Statistics 2000" and present population. The weight of milled grain includes seed reserve, animal feed, home-processed cereals and post-harvest losses as well as cereals for food. The target should be set up based on the potential survey on food production and forecasted population at the target year. The following table shows a sample on estimation for per capita milled grain production.

Table A Sample of Examination on Food Sufficiency

	Present			Proposed (2012)			Remarks
	Production (ton)	Milled *1 (ton)	Per capita (kg)	Production (ton)	Milled *1 (ton)	Per capita (kg)	
Paddy	464	278	62	628	377	66	Milling rate: 60 %
Maize	864	691	155	1100	880	154	Milling rate: 80 %
Others	34	27	6	49	39	7	Milling rate: 80 %
Total	1362	996	223	1777	1296	227	
Population *2		4456			5710		28 % increase

Note *1: Milling rate of rough grain to milled grain assumed to 60 % for paddy and 60 % for other cereals.

*2: Population will increase to 128 % during 10 years at present by annual growth rate of 2.5 %.

(d) Selection of potential cash crops in Gewog

Priority cash crops to be promoted in the Gewog should be examined based on the results of survey on suitability for agro-ecological conditions, prices of local and export market, production quantity and quality at present, farmers familiarity with crop, marketability, transportation cost, magnitude of storage, etc. DAO and RNR-RC will give technical support the selection.

(e) Cash crop production plan

Production plan of priority crops are shown in the table below.

Table A Sample of Vegetable (Potato) Production Plan

	Planted area (ha)	Yield (ton/ha)	Production (ton)	Marketable * (ton)
Present	12	12.5	150	30
Target (2012)	64	15	960	842

Note*: Marketable vegetable is estimated assuming that producer consumes 300kg per household of the products.

Table A Sample of Fruit (Orange) Production Plan

	Nos. of trees	Bearing trees	Yield (kg/tree)	Production (ton)	Marketable (ton)
Present	2490	840	50	42	2
Target (2012)	8520	5280	80	422	382

Note*: Marketable fruit is estimated assuming that producer consumes 100kg per household of the products.

(f) Examination of income increase by cash crops

Based on the above table income per household could be estimated as shown in the following table.

A Sample of Examination on Income Increase per Household by Cash Crop

	Production (kg/hh)	Marketable ^{*1} (kg/hh)	Price ^{*2} (Nu./kg)	Production value (Nu.)	Value sold (Nu.)
Vegetable (potato)					
Present	374	75	3.5	1309	263
Target (2012)	1875	1575	3.5	6563	5513
Fruit (orange)					
Present	104	4	3.5	364	14
Target (2012)	820	720	3.5	2870	2520

Note *1: Self consumption of the product: 300 kg/year/hh for vegetable, 100 kg/year/hh for fruits

*2: Average selling price at collection depot (auction prices at Samdrop Jongkhar of both crops: Nu.5/kg, transportation cost collection from depot to Samdrop Jongkhar: Nu.1.5/kg for Mongar)

X-3.5.2 Formulation of Action Plan

(1) Stakeholders

Stakeholders should be clarified through examination of role, responsibility and relations with the sub-program. The responsible stakeholders are EA under DAO and the Working Groups under Gup. DAO should support and coordinate EA activities in Gewog. RNR-RC will support technically EAs through DAO or directly. DSC should distribute required inputs according to the distribution plan in coordination with DAO. BDFC should provide credit service for group purchase of inputs. Beneficiaries must be farmers in the Gewog. *Implementation Organization (III)* of the Action Plan Sheet should be referred.

(2) Target of Program

Overall target of the program is to disseminate improved farming system of food crop and cash crop in order to maintain food sufficiency and increase cash income of farm households. Target of the program should be described on production of cereals (*Table: A Sample of Production Plan on Food Crop* in page X-29) and per capita milled grain (*Table: A Sample of Examination on Food Sufficiency* in page X-30) for food crops, and production of horticulture crops such as fruits, vegetables beans and others (*Table: A Sample of Vegetable (Potato) Production Plan* and *Table: A Sample of Fruit (Orange) Production Plan in the target year (2012)* in page X-30) as shown in Action Plan Sheets of Priority Gewogs.

(3) Activities

The contents of activities to be written in the Action Plan Sheet are shown below:

- ① Establishment of Working Groups for Food Crop and Cash Crop: Both Working Groups should be established in each several members (2- 4 staff) including at least one leader of GYT members. The groups in cooperation with EA should carry out potential survey, preparation of development plan, involving farmers to extension activity, and coordination / support of extension service of EA under Gup's responsibility.
- ② Survey of present situation and production potential on crop production (food and cash crops) including:
 - Agro-ecological condition (altitude) and suitability of crops and varieties,
 - Present condition and potential on farmland area, planting area, yield level, double cropping; irrigation; planting ratio of HYVs,
 - Potential and availability on dissemination of improved crop management/ post-harvest, reduction of labor requirement during peak busy season, mechanization of farming and transportation,

- Identification / selection of potential cash crop (short-term and long term) including medicinal and aromatic plant, non-timber forest products, through examination of marketing potential (market price, distance to Samdrup Jongkhar, transportation cost by vehicle, distance to assembling depot, required quality of products), farmers
 - Reduction of post-harvest loss of cereals (drying, storage)
- ③ Examination and selection of priority cash crops of Gewog
 - ④ Preparation of crop production plan including support services of extension and input distribution plan based on the results above survey,
 - ⑤ Request of budget arrangement for distribution of promotion seeds / seedling, Farmers Study Tour and Demonstration plot.
 - ⑥ Distribution of seeds / seedlings,
 - ⑦ Implementation of Farmers Field School (FFS), Demonstration Plot, and Farmers Study Tour (FST),
 - ⑧ Multiplication of seeds and seedlings in Gewog, if necessary.

(4) Input

Required quantity of subsidized improved seeds / seedlings for distribution to farmers should be written here. Total cost of required activities for demonstration plot should be described here, which will be provided inputs free of charge.

(5) Output

Anticipated outputs would be as follows

- Attainment / improvement of food sufficiency
- Preparation of crop production plan
- Capacity building of the Working Group through the survey and planning supported by EA

(6) Period

As the survey and planning on food crop must be carried out connecting with EA training on the procedures, it should be done by the end of December in 2003. Implementation of food crop development plan of Gewog will be started from July in 2004 covering whole Gewogs. Implementation of cash crop development plan will be scheduled according to the plan of farm road development considering marketing.

FFS, FST and group purchase of inputs in both sub-programs shall be implemented simultaneously.

(7) Related Program

This program is closely related with Food Security Sub-program, and Training of Extension Agent Sub-program of Program for Cash Crop Production Strengthening. The former sub-program includes EA training of food crop production, and the later program aims for train EAs on cash crop production.

(8) Project Justification

Results of following justification should be written here.

(a) Environment

Little serious impact to environment may occur by this program,

(b) Efficiency

Input is mostly procured by use of existing resources such as Dzongkhag officials, bi-products, surplus. In this sense, efficiency is quite high.

(c) Consistency with Upper Plan

- Food sufficiency level mentioned above should be written in per capita milled grain in target year for food crop sub-program,
- Prospective income increase per household mentioned above should be written here,

(d) Sustainability

Capacity building of Working Groups through joint working with EA will help attainment of the sustainability.

(9) Implementation Organization

The Program will be carried out in Gewog by EA in cooperation with Working Groups for Food Crop and Cash Crop under Gup. DAO should coordinate and support the activities through EA.

(10) Actions

Actions in the Action Plan Sheet should be described in time-sequence by referring to the sample action plans of priority Gewogs in Attachment. Each action should be discussed and examined with the Gewog people.

(11) Schedule

Schedule should be written in the same sequence of actions mentioned in (10) *Actions*. *Required Action* and *Period* (calendar date and schedule chart) in the form should be specified relevantly.

(12) Implementation and Monitoring System

Action Plan Sheet should be filled referring to the Action Plan Sheets of Priority Gewogs in Attachment. Responsible person of implementation and monitoring activity is Gup. Gup prepares quarterly progress report (every three months) and submit to DAO through the approval of GYT. DAO should take responsibility at Dzongkhag level.

As for budget arrangement, Gup should request the budget plan by December 2003 based on the action plan for distribution of subsidized seed and seedling. Implementation of extension activities for cash crops in remote Gewogs will start according to the schedule of farm road construction for the marketing.

X-3.6 Farm Road Construction Program

X-3.6.1 General

This program will be basically implemented in accordance with the Farm Roads Construction Procedural Manual (Module 1 to Module 4) formulated by MOA. Therefore the details to be described in the Action Plan Sheet will be cited referring to the contents and forms instructed in the Manual.

X-3.6.2 Formulation of Action Plan

(1) Program/ sub-program

Refer to Sub-section *X-2.4.1 General Information (1)*

(2) Stakeholders

Refer to Sub-section *X-2.4.1 General Information (2)* and *Organization/Name* and *Contact Person* will be described in the Action Plan Sheet by *Level* referring to the following information.

- National Level: Same as Section X-3.2 Irrigation Development Sub-program
- Dzongkhag Level: Same as X-3.2 Irrigation Development Sub-program since DE/DAO is mainly concerned in the arrangement on farm roads construction procedure at any stages.
- Gewog Level: Same as Section X-3.2 Irrigation Development Sub-program
- Beneficiaries Level: As FRUC is not established at the initial stage, tentative FRUC will be composed of someone who will be benefited by the program. Therefore tentative FRUC¹ is the object and it is preferable that *Contact Person* will be selected from GYT members since FRUC is not established yet at the initial stage as well.

(3) Target

Number of households whose access to motor road is improved by this program will be described as the *Target*.

(4) Activities

The items to be described as the *Activities* in the Action Plan Sheet will be basically cited referring to the *Activities* described in Sub-section *X-2.4.2 Confirmation on Programs/ Sub-programs (2)*. The following items are considered in this program.

- Survey, Design and Cost Estimation
- Construction of farm road
- Maintenance by FRUC
- Training of beneficiaries on construction skills through OJT
- Training of Road Engineer
- Procurement of construction materials and tools
- Procurement of construction machinery
- Environmental study

¹ In the Action Plan of the priority Gewogs, "Farm Road Construction Promoting Association (FRCPA)" is proposed.

- Financial arrangement
- Establishment of organization

(5) Input

Though this is also described in the Action Plan Sheet on the basis of the instruction of the *Input* described in Sub-section *X-2.4.2 Confirmation on Programs/ Sub-programs (3)*, the following items are considered in this program.

- Surveyor
- Civil Engineer for Design
- Civil Engineer for Supervision
- Construction Machinery with Operator
- Construction Materials and Tools
- Skilled Labor
- Unskilled Labor
- Maintenance by FRUC
- Project Cost

(6) Output

Operation and maintenance becomes possible by increasing numbers of skilled worker in this program. Then the farm road length to be newly constructed will be described as the *Output* and the other facilities to be newly constructed other than the farm road will be concretely described as much as possible. As for the length of farm road, it will be properly measured on the basis of the 1/50,000 scale map with contour line in consideration of the engineering parameters especially its gradient.

(7) Period

In consideration of the necessary time of each identified activity, the *Period* will be described in the Action Plan Sheet at least regarding survey and design, construction and maintenance. The maintenance period will be described in the mark (~, from when).

(8) Related Program

Though this is also described in the Action Plan Sheet on the basis of the instruction of the Related Program described in *X-2.4.2 Confirmation on Programs/ Sub-programs (6)* and Sub-section *X-2.4.1 General Information (1)*, the following programs are considered in this program.

- Construction Machinery Center Program
- Market System Development Program

(9) Project Justification

Project justification will be described in the Action Plan Sheet by environment, efficiency, consistency and sustainability, the following items are considered and described its situation or evaluation in this program.

(a) Environment

Situation of IEE, necessity of further environmental assessment and authorization issuance of NEC, in this program EIA will be required.

(b) Efficiency

Reasonable range of construction unit cost for farm road per km estimated in consultation with Dzongkhag Engineering Office. The regulations stipulated in the Guidelines for Farm Roads Development of MOA should be described in the Action Plan Sheet. For example, a minimum of ten households of 70 people per km and total cultivated area per season should not be less than 30 acres per km.

(c) Consistency

In consideration of the upper plans and programs, this program is executed based on the program of MOA that is Farm Roads Development Program and its Procedural Manual.

(d) Sustainability

In accordance with the instructions described in the Procedural Manual, it will be confirmed and described in the Action Plan Sheet regarding the participation and maintenance contribution fund and so on.

(10) Organization Chart

This is illustrated in consideration of not only the existing organizations from national level to beneficiaries' level but also proposed organizations (new) with their functions on the basis of the Gewog development plan discussed in GYT. Therefore MOA, Dzongkhag, DYT, Gewog, GYT, FRUC, Beneficiaries and proposed organizations will be illustrated in the Organization Chart.

(11) General Role and Responsibility

This is described in the Action Plan Sheet by each stakeholder level (National, Dzongkhag, Gewog and Beneficiaries). In this program, DRDS, MOA at National level, Dzongkhag Engineering/Agriculture Office at Dzongkhag level, GYT at Gewog level and FRUC at Beneficiaries level are described in the Action Plan Sheet.

(12) Action Plan

(a) Required Action

As aforementioned above, the program will be basically implemented in accordance with the Farm Road Construction Procedural Manual (Module 1 to Module 4) formulated by MOA. Though required actions in general are indicated in Sub-section X-2.4.4 *Actions (1)*, actual required actions for the program will be officially formulated based on the Procedural Manual taking account of required actions in general and specific required action, if any. In particular, financial arrangement and participation of beneficiaries to be deemed as the required actions shall be itemized and described in the Action Plan Sheet.

(b) Responsible Stakeholder

Same as Section X-3.2 Irrigation Development Sub-program

(c) Detailed Activities

Same as Section X-3.2 Irrigation Development Sub-program

(13) Schedule

(a) Required Action

This is automatically converted from the required actions itemized in (12) *Action Plan*.

(b) Period and Schedule

Same as Section X-3.2 Irrigation Development Sub-program

(14) Implementation and Monitoring System

In this program, the following plan will be considered taking account of the existing system and the Procedural Manual for the time being, however the plan will be modified on the basis of the current situation and system.

(a) Progress Management

Who: DE/DAPO, Dzongkhag of planned Gewog
When: Every three months
Where: Dzongkhag Engineering/Agriculture Office of planned Gewog
How: Quarterly report prepared by DE

(b) Budget Management

1) At Preparatory Stage

Who: Superintending Engineer, DRDS, MOA
When: Every Financial Year
Where: MOA Office, Thimphu
How: As per Financial Manual of RGOB

2) At Implementation Stage

Who: DAO, Dzongkhag of planned Gewog
When: Monthly basis
Where: Dzongkhag Agriculture Office of planned Gewog
How: As per Financial Manual of RGOB

3) At O & M Stage

Who: Chairperson, FRUC
When: Monthly basis
Where: Accountant, FRUC
How: Constitution/Bylaws enacted in FRUC

(c) Problem Solving:

Who:

- Budget arrangement: Superintending Engineer, DRDS, MOA at preparatory stage/ DAO, Dzongkhag at implementation stage/ Chairperson, FRUC at O&M stage,
- Technical problems: DE, Dzongkhag,
- Accident • Participation • Dispute: Chairperson, FRUC,
- Manpower: Superintending Engineer, DRDS, MOA

When: As the problems happened
Where:

- Budget arrangement: DRDS, MOA at preparatory stage and implementation stage/ FRUC at O&M stage,
- Technical problems: Dzongkhag Engineering Office
- Accident • Participation • Dispute: FRUC Office
- Manpower: DRDS, MOA

How:

- Budget arrangement: DRDS, MOA discusses with MOF at preparatory stage and implementation stage/ FRUC discusses among the beneficiaries at O&M stage,
- Technical problems: Dzongkhag Engineering explains the countermeasures to the beneficiaries,
- Accident • Participation • Dispute: FRUC discusses among the beneficiaries and third party,
- Manpower: DRDS, MOA discusses with the organization concerned

X-3.7 Farm Mule Track Construction Program

X-3.7.1 General

The Farm Roads Construction Procedural Manual (Module 1 to Module 4) has been prepared by MOA. This program will be basically implemented in accordance with this Procedural Manual. Therefore the details to be described in the Action Plan Sheet will be cited referring to the contents and forms instructed in the Manual.

X-3.7.2 Formulation of Action Plan

(1) Program/ sub-program

Refer to Sub-section *X-2.4.1 General Information (1)*

(2) Stakeholders

Refer to Sub-section *X-2.4.1 General Information (2)* and *Organization/Name* and *Contact Person* will be described in the Action Plan Sheet by *Level* referring to the following information.

- National Level: Same as Section X-3.2 Irrigation Development Sub-program
- Dzongkhag Level: Same as Section X-3.2 Irrigation Development Sub-program since DE/DAO is mainly concerned in the arrangement on farm mule track construction procedure at any stages.
- Gewog Level: Same as Section X-3.2 Irrigation Development Sub-program
- Beneficiaries Level: As FMTUC is not established at the initial stage, tentative FMTUC will be conformed by someone who will be benefited by the program. Therefore tentative FMTUC is the object and it is preferable that *Contact Person* will be selected from GYT members since FMTUC is not established yet at the initial stage as well.

(3) Target

No. of household that access to motor road is improved in this program will be described as the *Target*.

(4) Activities

The items to be described as the *Activities* in the Action Plan Sheet will be basically cited referring to the *Activities* described in Section X-2.4.2 *Confirmation on Programs/ Sub-programs (2)*. The following items are considered in this program.

- Survey, Design and Cost Estimation
- Construction of farm mule track
- Maintenance by FMTUC
- Training of beneficiaries on construction skills through OJT
- Training of Road Engineer
- Procurement of construction materials and tools
- Financial arrangement
- Establishment of organization

(5) Input

Though this is also described in the Action Plan Sheet on the basis of the instruction of the *Input* described in Sub-section X-2.4.2 *Confirmation on Programs/ Sub-programs (3)*, the following items are considered in this program.

- Surveyor
- Civil Engineer for Design
- Civil Engineer for Supervision
- Construction Materials and Tools
- Skilled Labor
- Unskilled Labor
- Maintenance by FMTUC
- Project Cost

(6) Output

Operation and maintenance becomes possible by increasing numbers of skilled worker in this program. Then the farm mule track length to be newly constructed will be described as the *Output* and the other facilities to be newly constructed other than the farm mule track will be concretely described as much as possible. As for the length of farm mule track, it will be properly measured on the basis of the 1/50,000 scale map with contour line in consideration of the engineering parameters especially its gradient, as the farm mule track will be upgraded in future.

(7) Period

In consideration of the necessary time of each identified activity, the *Period* will be described in the Action Plan Sheet at least regarding survey and design, construction and maintenance. The maintenance period will be described in the mark (~, from when).

(8) Related Program

Though this is also described in the Action Plan Sheet on the basis of the instruction of Related Program described in Sub-section X-2.4.2 *Confirmation on Programs/ Sub-programs (6)* and Sub-section X-2.4.1 *General Information (1)*, the following programs are considered in this program.

- Market System Development Program

(9) Project Justification

Project justification will be described in the Action Plan Sheet by environment, efficiency, consistency and sustainability, the following items are considered and described its situation or evaluation in this program.

(a) Environment

Situation of IEE, necessity of further environmental assessment and authorization issuance of NEC, the necessity of EIA will be studied whether it is necessary or not.

(b) Efficiency

Reasonable range of construction unit cost for farm mule track per km estimated in consultation with Dzongkhag Engineering Office. The regulations stipulated in the Guidelines for Farm Roads Development of MOA should be described in the Action Plan Sheet. For example, a minimum of ten households of 70 people per km and total cultivated area per season should not be less than 30 acres per km. Because farm mule track will be upgraded to the farm road in the future.

(c) Consistency

In consideration of the upper plans and programs, this program is executed and followed based on the program of MOA that is Farm Roads Development Program and its Procedural Manual.

(d) Sustainability

In accordance with the instructions described in the Procedural Manual, it will be confirmed and described in the Action Plan Sheet regarding the participation and maintenance contribution fund and so on.

(10) Organization Chart

This is illustrated in consideration of not only the existing organizations from national level to beneficiaries' level but also proposed organizations (new) with their functions on the basis of the Gewog development plan discussed in GYT. Therefore MOA, Dzongkhag, DYT, Gewog, GYT, FMTUC, Beneficiaries and proposed organizations will be illustrated in the Organization Chart.

(11) General Role and Responsibility

This is described in the Action Plan Sheet by each stakeholder level (National, Dzongkhag, Gewog and Beneficiaries). In this program, DRDS, MOA at National level, Dzongkhag Engineering/Agriculture Office at Dzongkhag level, GYT at Gewog level and FMTUC at Beneficiaries level are described in the Action Plan Sheet.

(12) Action Plan

(a) Required Action

Same as Section 3.6 Farm Road Construction Program.

(b) Responsible Stakeholder

Same as Section X-3.6 Farm Road Construction Program.

(c) Detailed Activities

Same as Section X-3.6 Farm Road Construction Program.

(13) Schedule

(a) Required Action

This is automatically converted from the required actions itemized in (12) *Action Plan*.

(b) Period and Schedule

Same as Section X-3.6 Farm Road Construction Program.

(14) Implementation and Monitoring System

In this program, the following plan will be considered taking account of the existing system and the Procedural Manual for the time being, however the plan will be modified on the basis of the current situation and system.

(a) Progress Management:

Who: DE/DAO, Dzongkhag of planned Gewog

When: Every three months

Where: Dzongkhag Engineering/Agriculture Office of planned Gewog

How: Quarterly report prepared by DE

(b) Budget Management:

1) At Preparatory Stage

Who: Superintending Engineer, DRDS, MOA

When: Every Financial Year

Where: MOA Office, Thimphu

How: As per Financial Manual of RGOB

2) At Implementation Stage

Who: DAO, Dzongkhag of planned Gewog

When: Monthly basis

Where: Dzongkhag Agriculture Office of planned Gewog

How: As per Financial Manual of RGOB

3) At O & M Stage

Who: Chairperson, FMTUC

When: Monthly basis

Where: Accountant, FMTUC

How: Constitution/Bylaws enacted in FMTUC

(c) Problem Solving:

Who:

- Budget arrangement: Superintending Engineer, DRDS, MOA at preparatory stage/ DAO, Dzongkhag at implementation stage/ Chairperson FMTUC at O&M stage,
- Technical problems: DE, Dzongkhag,
- Accident • Participation • Dispute: Chairperson, FMTUC,
- Manpower: Superintending Engineer, DRDS, MOA,

When: As the problems happened

Where:

- Budget arrangement: DRDS, MOA at preparatory stage and implementation stage/ FMTUC at O&M stage,
- Technical problems: Dzongkhag Engineering Office
- Accident • Participation • Dispute: FMTUC Office
- Manpower: DRDS, MOA,

How:

- Budget arrangement: DRDS, MOA discusses with MOF at preparatory stage and implementation stage/ FMTUC discusses among the beneficiaries at O&M stage,
- Technical problems: Dzongkhag Engineering explains the countermeasures to the beneficiaries,
- Accident • Participation • Dispute: FMTUC discusses among the beneficiaries and third party,
- Manpower: DRDS, MOA discusses with the organization concerned

X-3.8 Light-load Bridge Construction Program

X-3.8.1 General

The Farm Roads Construction Procedural Manual (Module 1 to Module 4) has been prepared by MOA and also the Guidelines for Light-load Bridge Construction will be finally prepared by MOA. This program will be basically implemented in accordance with those Procedural Manual and Guidelines attached to Annex XI tentatively. Therefore the details to be described in the Action Plan Sheet will be cited referring to the contents and forms instructed in the Manual and Guidelines.

X-3.8.2 Formulation of Action Plan

(1) Program/ sub-program

Refer to Sub-section *X-2.4.1 General Information (1)*

(2) Stakeholders

Refer to Sub-section *X-2.4.1 General Information (2)* and *Organization/Name* and *Contact Person* will be described in the Action Plan Sheet by *Level* referring to the following information.

- National Level: Same as Section 3.2 Irrigation Development Sub-program
- Dzongkhag Level: Same as Section 3.2 Irrigation Development Sub-program since DE/DAO is mainly concerned in the arrangement on light-load bridge construction procedure at any stages.
- Gewog Level: Same as Section 3.2 Irrigation Development Sub-program
- Beneficiaries Level: LBUC is not established at the initial stage, then all Gewog people might be benefited by the program. Therefore all Gewog is the object and it is preferable that *Contact Person* will be selected from GYT members since LBUC

is not established yet at the initial stage as well.

(3) Target

No. of household that is benefited in this program will be described as the *Target*.

(4) Activities

The items to be described as the *Activities* in the Action Plan Sheet will be basically cited referring to the *Activities* described in Sub-section X-2.4.2 *Confirmation on Programs/ Sub-programs (2)*. The following items are considered in this program.

- Survey, Design and Cost Estimation (referring to Guidelines)
- Construction of light-load bridge
- Maintenance by LBUC
- Training for Dzongkhag engineer
- Training for LBUC
- Procurement of construction materials and tools
- Financial arrangement
- Establishment of organization

(5) Input

Though this is also described in the Action Plan Sheet on the basis of the instruction of the *Input* described in Sub-section X-2.4.2 *Confirmation on Programs/ Sub-programs (3)*, the following items are considered in this program.

- Surveyor
- Civil Engineer for Design
- Civil Engineer for Supervision
- Construction Materials and Tools
- Skilled Labor
- Unskilled Labor
- Maintenance by LBUC
- Project Cost

(6) Output

Operation and maintenance becomes possible by increasing numbers of skilled worker in this program. Then the light-load bridge span to be newly constructed or of replacement will be described as the *Output* and the other facilities to be newly constructed or of replacement other than the light-load bridge will be concretely described as much as possible.

(7) Period

In consideration of the necessary time of each identified activity, the *Period* will be described in the Action Plan Sheet at least regarding survey and design, construction and maintenance. The maintenance period will be described in the mark (~, from when).

(8) Related Program

Though this is also described in the Action Plan Sheet on the basis of the instruction of the *Related Program* described in Sub-section 2.4.2 *Confirmation on Programs/ Sub-programs (6)* and Sub-section 2.4.1 *General Information (1)*, the following programs are considered in this program.

- Construction Machinery Center Program
- Market System Development Program

(9) Project Justification

Project justification will be described in the Action Plan Sheet by environment, efficiency, consistency and sustainability, the following items are considered and described its situation or evaluation in this program.

(a) Environment

Situation of IEE, necessity of further environmental assessment and authorization issuance of NEC, in this program the necessity of EIA will be studied whether it is necessary or not.

(b) Efficiency

Reasonable range of construction cost per light-load bridge estimated in consultation with Dzongkhag Engineering Office, and the cost of construction must be less than that of the detour to cross a river or stream in consideration of the physical condition and existing road system.

(c) Consistency

In consideration of the upper plans and programs, this program is executed and followed based on the program of MOA that is Farm Roads Development Program and its Procedural Manual.

(d) Sustainability

In accordance with the instructions described in the Procedural Manual, it will be confirmed and described in the Action Plan Sheet regarding the participation and maintenance contribution fund and so on.

(10) Organization Chart

This is illustrated in consideration of not only the existing organizations from national level to beneficiaries' level but also proposed organizations (new) with their functions on the basis of the Gewog development plan discussed in GYT. Therefore MOA, Dzongkhag, DYT, Gewog, GYT, LBUC, Beneficiaries and proposed organizations will be illustrated in the Organization Chart.

(11) General Role and Responsibility

This is described in the Action Plan Sheet by each stakeholder level (National, Dzongkhag, Gewog and Beneficiaries). In this program, DRDS, MOA at National level, Dzongkhag Engineering/Agriculture Office at Dzongkhag level, GYT at Gewog level and FRUC at Beneficiaries level are described in the Action Plan Sheet.

(12) Action Plan

(a) Required Action

Same as Section 3.6 Farm Road Construction Program.

(b) Responsible Stakeholder

Same as Section 3.6 Farm Road Construction Program.

(c) Detailed Activities

Same as Section 3.6 Farm Road Construction Program.

(13) Schedule

(a) Required Action

This is automatically converted from the required actions itemized in (12) *Action Plan*.

(b) Period and Schedule

Same as Section 3.6 Farm Road Construction Program.

(14) Implementation and Monitoring System

In this program, the following plan will be considered taking account of the existing system and the Procedural Manual for the time being, however the plan will be modified on the basis of the current situation and system.

(a) Progress Management

Who: DE/DAO, Dzongkhag of planned Gewog

When: Every three months

Where: Dzongkhag Engineering/Agriculture Office of planned Gewog

How: Quarterly report prepared by Dzongkhag Engineer (DE)

(b) Budget Management

1) At Preparatory Stage

Who: Superintending Engineer, DRDS, MOA

When: Every Financial Year

Where: MOA Office, Thimphu

How: As per Financial Manual of RGOB

2) At Implementation Stage

Who: DAO, Dzongkhag of planned Gewog

When: Monthly basis

Where: Dzongkhag Engineering Office of planned Gewog

How: As per Financial Manual of RGOB

3) At O & M Stage

Who: Chairperson, LBUC

When: Monthly basis

Where: Accountant, LBUC

How: Constitution/Bylaws enacted in LBUC

(c) Problem Solving

Who:

- Budget arrangement: Superintending Engineer, DRDS, MOA at preparatory stage/ DAO, Dzongkhag at implementation stage/ Chairperson, LBUC at O&M stage,
- Technical problems: DE, Dzongkhag,
- Accident • Participation • Dispute: Chairperson, LBUC,
- Manpower: Superintending Engineer, DRDS, MOA,

When: As the problems happened

Where:

- Budget arrangement: DRDS, MOA at preparatory stage and implementation stage/ LBUA at O&M stage,
- Technical problems: Dzongkhag Engineering Office
- Accident • Participation • Dispute: LBUC Office
- Manpower: DRDS, MOA,

How:

- Budget arrangement: DRDS, MOA discusses with MOF at preparatory stage and implementation stage/ LBUC discusses among the beneficiaries at O&M stage,
- Technical problems: Dzongkhag Engineering explains the countermeasures to the beneficiaries,
- Accident • Participation • Dispute: LBUC discusses among the beneficiaries and third party,
- Manpower: DRDS, MOA discusses with the organization concerned