

Attachment-1

Action Plan Sheet

I. General

| | |
|-----------|-----|
| Sheet No. | AP- |
|-----------|-----|

| | | | |
|--------------|---------------|---------------------|----------------|
| Program | | | |
| Sub-program | | | |
| Stakeholders | Level | Organization / Name | Contact Person |
| | National | | |
| | Dzongkhag | | |
| | Gewog | | |
| | Beneficiaries | | |

II. Program/Sub-program

| | |
|--|--|
| Target | |
| Activities | |
| Input | |
| Output | |
| Period | |
| Related Program / Sub-program (How) | |
| Project Justification | |

III. Implementing Organization

(a) Organization chart (organogram)

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| |
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(b) General Role and Responsibility of Stakeholders

| Stakeholder | | General Role and Responsibility |
|---------------|--|---------------------------------|
| National | | |
| Dzongkhag | | |
| Gewog | | |
| Beneficiaries | | |

IV. Action Plan (sequent)

| | Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|---|---------------------------|-------------------------------------|---------------------------------|
| 1 | | | |
| 2 | | | |

| Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|---------------------------|-------------------------------------|---------------------------------|
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
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| 8 | | |
| 9 | | |
| 10 | | |

V. Schedule

| Required Action (WHAT) | Period | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
|---------------------------|--------|----|----|----|----|----|----|----|----|----|----|----|
| | | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | |
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| 6 | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | |

| Required Action (WHAT) | Period | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
|---------------------------|--------|----|----|----|----|----|----|----|----|----|----|----|
| | | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| 10 | | | | | | | | | | | | |

VI. Implementation and Monitoring System of Action Plan

| Action | Plan | |
|---|-------|--|
| Progress Management of A/P | WHO | |
| | WHEN | |
| | WHERE | |
| | HOW | |
| Budget Management at Preparatory Stage | WHO | |
| | WHEN | |
| | WHERE | |
| | HOW | |
| Budget Management at Implementation Stage | WHO | |
| | WHEN | |
| | WHERE | |
| | HOW | |
| Budget Management at O&M Stage | WHO | |
| | WHEN | |
| | WHERE | |
| | HOW | |
| Problem Solving | WHO | |
| | WHEN | |
| | WHERE | |
| | HOW | |

Attachment-2

PREFACE

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

1.1.1 Somshing Scheme (Rehabilitation)

I. General

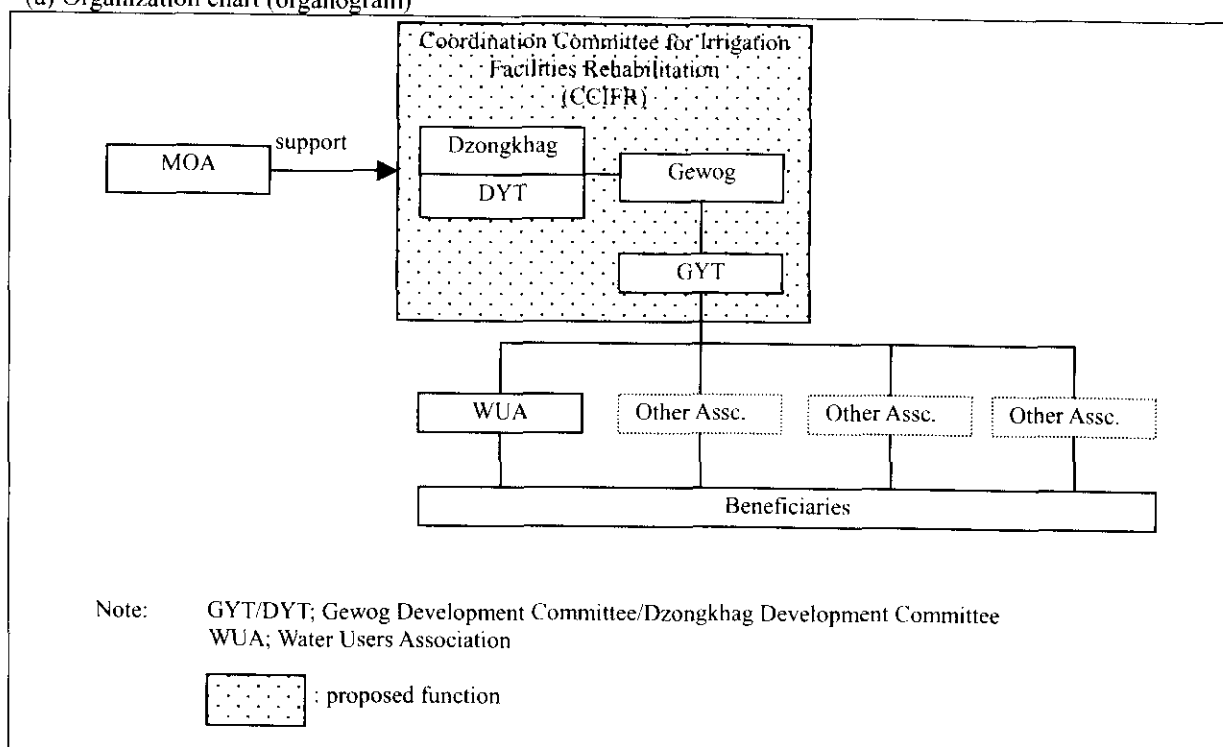
| | | | |
|---|---------------|---------------------|---|
| Program | | Sheet No. | AP-1 |
| Program for Food Crop Production Increase / Gangzur / Lhuntse | | | |
| Sub-program | | | |
| Irrigation Development Sub Program (Rehabilitation, Somshing) | | | |
| Stakeholders | Level | Organization / Name | Contact Person |
| | National | MOA | Mr. Kaylzan Tshering (SE. DRDS, 02-322228) |
| | Dzongkhag | Lhuntse | Mr. Om Nath Giri (DE, 04-545128) Mr. Deepak Rai (DAO, 04-545127) |
| | Gewog | GYT | Mr. (Gup) |
| | Beneficiaries | WUA (50HH) | Mr. (Chairman) |

II. Program/Sub-program

| | |
|-------------------------------------|---|
| Target | To increase food crop production, irrigated area=40.5ha |
| Activities | <ul style="list-style-type: none"> • Survey, Plan and Cost estimation • Rehabilitation of irrigation facilities • Maintenance by Water Users Association • Procurement of construction materials and tools • Financial arrangement |
| Input | <ul style="list-style-type: none"> • Surveyor (Dzongkhag) • Irrigation Engineer for Rehabilitation Plan (Dzongkhag) • Irrigation Engineer for Supervision (Dzongkhag) • Construction Materials (DRDS, MOA) • Skilled Labor (Mason, Carpenter etc.) • Unskilled Labor (WUA) • Project Cost Nu. 0.53 mil. • Maintenance by Water Users Association |
| Output | The existing irrigation facilities are rehabilitated to attain the food crop production increase. (canal length=4.0km, water management improvement) |
| Period (Tentative) | <ul style="list-style-type: none"> • Survey and Plan 2003.7~2004.6 • Rehabilitation 2004.7~2007.6 • Maintenance 2007.7~ |
| Related Program / Sub-program (How) | <ul style="list-style-type: none"> • Program for Food Crop Production Increase/Food Security SP, Paddy-rice Production SP, Post-harvest Technology Training SP(They will be executed together with Irrigation Development SP) • Extension Strengthening Program/Extension Strengthening for Food Crop SP(Extension will be executed to the beneficiaries of rehabilitated irrigation facilities) |
| Project Justification | <ul style="list-style-type: none"> • Environment: IEE was conducted in the Master Plan. As this is actually rehabilitation of irrigation facilities, it will be enough to assess by only the routine environmental checking by NEC to be executed before the commencement of rehabilitation and an authorization issuance of NEC will be applied by Dzongkhag. • Efficiency: Reasonable range of rehabilitation cost of canal per km is about 132,000 Nu estimated in 9th FYP in the maximum limitation. • Consistency with upper plan/program: This is based on the program of MOA. • Sustainability: The participation of beneficiaries, maintenance fund contribution and so on should be confirmed on the basis of the national irrigation policy procedural manual prepared by MOA. |

III. Implementing Organization

(a) Organization chart (organogram)



(b) General Role and Responsibility of Stakeholders

| Stakeholder | | General Role and Responsibility |
|---------------|---|---|
| National | DRDS, MOA | Responsible for the program comprehensively in terms of finance, technical backstopping and coordination with other stakeholders. |
| Dzongkhag | Engineering Office/ Agriculture Office | Actually supervises WUA from rehabilitation and maintenance by WUA including accounting of the program. |
| Gewog | GYT | Formulate the Gewog rehabilitation plan and evaluate the program in the plan, and based on this, made the official request letter and submit it to Dzongkhag. |
| Beneficiaries | WUA | Directly engages in the program and participate the rehabilitation and maintenance from at the inspection of facilities as unskilled labor free of charge. |

IV. Action Plan (sequent)

| Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|---|-------------------------------|---|
| 1 Consensus in GYT | GYT | The request of irrigation facilities rehabilitation from WUA will be discussed in GYT and with the consensus will be proceeded to Dzongkhag. |
| 2 Official request (IRRIFORM.01) for rehabilitation | GYT | The GYT member will prepare a request letter and the letter with the signature of Gup will be officially submitted to Dzongkhag with necessary information for evaluation (required works, contribution by Gewogs or beneficiaries, etc.) |
| 3 Inspection of facilities to be rehabilitated | Dzongkhag/ WUA | The inspection will be executed to find out whether the proposed request meets the basic requirements for government assistance. The rehabilitation identification report will be made for further procedure referring to Module 1. |
| 4 Consensus in DYT | Dzongkhag / DYT | The request will be discussed based on the rehabilitation identification report, and with the consensus and Dzongkhag's approval will be proceeded to MOA and MOF for further procedure for budget allocation. |
| 5 Budget allocation for | Dzongkhag | The budget for rehabilitation survey will be arranged in MOF after |

| Required Action (WHAT) | | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|------------------------|---|-------------------------------|--|
| | rehabilitation survey | | scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 6 | Survey and plan for rehabilitation | Dzongkhag | Rehabilitation survey will be executed to determine whether the proposed request is reasonable and necessary or not. The rehabilitation survey report with a detailed rehabilitation plan, countermeasures for the problems and estimation of the rehabilitation cost will be made referring to Module 2. |
| 7 | Budget allocation for rehabilitation | Dzongkhag | The budget for rehabilitation of irrigation facilities will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 8 | Procurement of materials and tools | Dzongkhag | Supplying materials and tools including technical backstopping from Dzongkhag for rehabilitation of irrigation facilities will be arranged based on the requisition of Dzongkhag in Implementation. |
| 9 | Overall management of rehabilitation | Dzongkhag | The rehabilitation of irrigation facilities will be carried out under the management of Dzongkhag in Implementation. |
| 10 | Arrangement of unskilled labor | WUA | WUA shall provide free unskilled labor in accordance with the arrangement of the site in-charge. |
| 11 | Reserving fund for maintenance works | WUA | For the following maintenance, the fund will be reserved in the system of WUA as same as the proposed irrigation scheme. |
| 12 | Routine maintenance | WUA | Routine maintenance like canal cleaning, weeding will be periodically and timely carried out under the guidance of the site in-charge after rehabilitation. |
| 13 | Periodical maintenance | WUA | Annual maintenance for natural calamity and unexpected disasters will be periodically carried out under the guidance of the site in-charge after rehabilitation. |
| 14 | Periodical repair works | MOA/ WUA | Major repair will be executed using construction machinery to be arranged by CMU/MOA and Dzongkhag every five year after rehabilitation, if necessary. |
| 15 | Establishment period inspection visit | Dzongkhag | Inspection and evaluation of the irrigation system will be executed each year during the establishment period (in five years after the rehabilitation) to monitor and evaluate the condition of the irrigation system, functioning WUA, crop productivity and assess the need for further Dzongkhag support in accordance with Module 8. |
| 16 | Dzongkhag water users' association conference | Dzongkhag | This provides a forum where representatives of different WUAs can present and discuss progress, programs and problems. each year during the establishment period(in five years after the rehabilitation) During the conference measures to overcome certain problems facing the WUAs can be framed jointly by the concerned WUA and the Dzongkhag irrigation sector according to Module 9. |

Note: FORM and Module are procedure regulated for irrigation facilities development by MOA, the irrigation facilities rehabilitation program will follow this procedure as well.

V. Schedule

| Required Action (WHAT) | | Time Limit (By WHEN) | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|----------------------|------|------|------|------|------|------|------|------|------|------|------|
| 1 | Consensus in GYT | 2003.4 | | | | | | | | | | | |
| 2 | Official request (IRRIFORM.01) for rehabilitation | 2003.4 | | | | | | | | | | | |

| Required Action (WHAT) | | Time Limit (By WHEN) | 20 02 | 20 03 | 20 04 | 20 05 | 20 06 | 20 07 | 20 08 | 20 09 | 20 10 | 20 11 | 20 12 |
|---------------------------|---|-------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 3 | Inspection of facilities to be rehabilitated | 2003.5 | | ☐ | | | | | | | | | |
| 4 | Consensus in DYT | 2003.5 | | ☐ | | | | | | | | | |
| 5 | Budget allocation for rehabilitation survey | 2003.6 | | ☐ | | | | | | | | | |
| 6 | Survey and plan estimation for rehabilitation | 2003.7 - 2004.3 | | ☐ | | | | | | | | | |
| 7 | Budget allocation for rehabilitation | 2004.3 | | | ☐ | | | | | | | | |
| 8 | Procurement of materials and tools | 2004.4 - 2004.6 | | | ☐ | | | | | | | | |
| 9 | Overall management of rehabilitation | 2004.7 - 2007.6 | | | | ☐ | | | | | | | |
| 10 | Arrangement of unskilled labor | 2004.7 - 2007.6 | | | | ☐ | | | | | | | |
| 11 | Reserving fund for maintenance works | 2007.1 - | | | | | | ☐ | | | | | |
| 12 | Routine maintenance | 2007.7 - | | | | | | ☐ | | | | | |
| 13 | Periodical maintenance | 2008.7 - | | | | | | | ☐ | ☐ | ☐ | ☐ | ☐ |
| 14 | Periodical repair works | 2012.6- | | | | | | | | | | | ☐ |
| 15 | Establishment period inspection visit | 2007.11 - 2011.11 | | | | | | | ☐ | ☐ | ☐ | ☐ | ☐ |
| 16 | Dzongkhag water users' association conference | 2008.1 - | | | | | | | ☐ | ☐ | ☐ | ☐ | ☐ |

VI. Implementation and Monitoring System

| Action | Plan | |
|---|-------|--|
| Progress Management of A/P | WHO | DE/DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Engineering/Agriculture Office |
| | HOW | Monthly Report prepared by Site Engineer of Dzongkhag |
| Budget Management at Preparatory Stage | WHO | Superintending Engineer, DRDS, MOA |
| | WHEN | Every Financial Year |
| | WHERE | MOA Office, Thimphu |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at Implementation Stage | WHO | DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Agriculture Office |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at O&M Stage | WHO | Chairperson, WUA |
| | WHEN | Monthly basis |
| | WHERE | Accountant, WUA |
| | HOW | Constitution/Bylaws enacted in WUA |
| 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/ Agriculture Office, Dzongkhag at implementation stage/ WUA Office 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 Office discusses with the beneficiaries. Accident, Participation, Dispute: WUA Office discusses among the beneficiaries and third party. Manpower: DRDS, MOA discusses with the organization concerned. |

1.1.2 Ney Scheme (Rehabilitation)

I. General

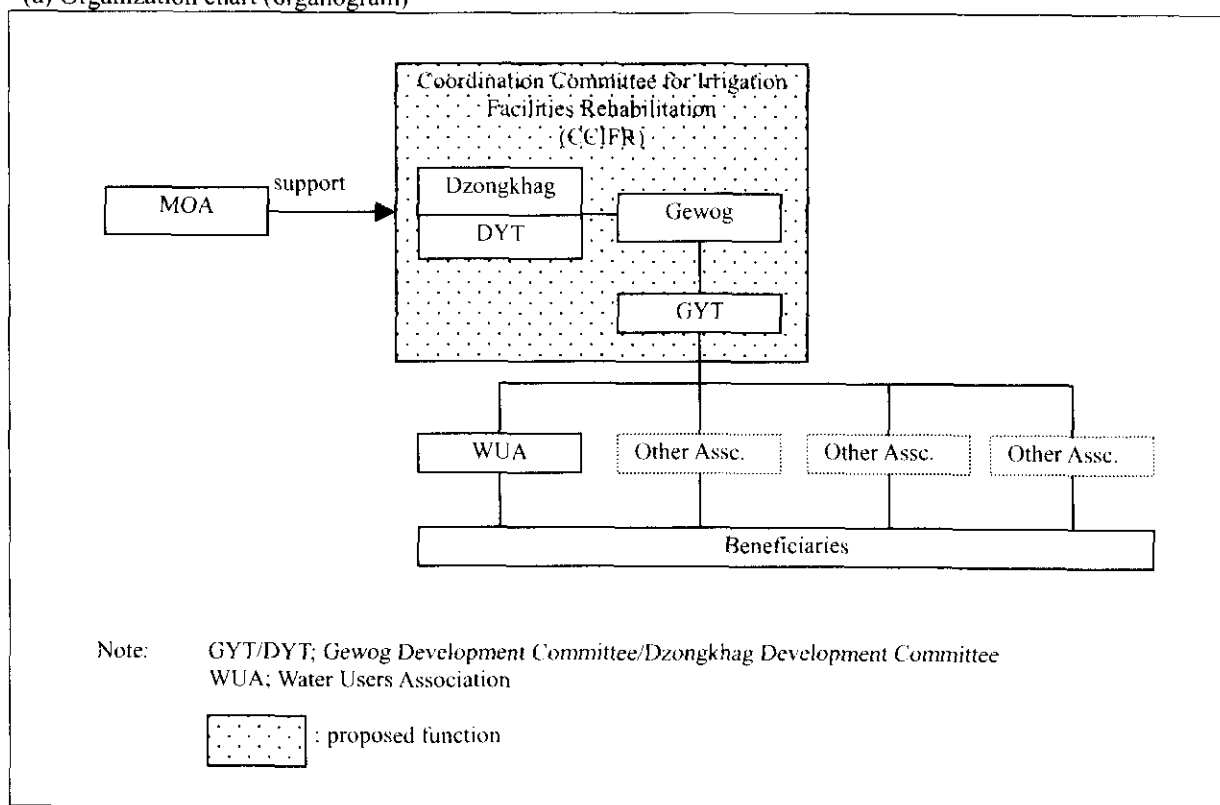
| | | | |
|--|--|---------------------|---|
| Program | Sheet No. | | AP-2 |
| Program for Food Crop Production Increase / Gangzur / Lhuntse | | | |
| Sub-program | Irrigation Development Sub Program (Rehabilitation, Ney) | | |
| Stakeholders | Level | Organization / Name | Contact Person |
| | National | MOA | Mr. Kaylzung Tshering (SE. DRDS, 02-322228) |
| | Dzongkhag | Lhuntse | Mr. Om Nath Giri (DE, 04-545128) Mr. Deepak Rai (DAO, 04-545127) |
| | Gewog | GYT | Mr. (Gup) |
| | Beneficiaries | WUA (60HH) | Mr. (Chairman) |

II. Program/Sub-program

| | |
|--|--|
| Target | To increase food crop production, irrigated area=60.7ha |
| Activities | <ul style="list-style-type: none"> • Survey, Plan and Cost estimation • Rehabilitation of irrigation facilities • Maintenance by Water Users Association • Procurement of construction materials and tools • Financial arrangement |
| Input | <ul style="list-style-type: none"> • Surveyor (Dzongkhag) • Irrigation Engineer for Rehabilitation Plan (Dzongkhag) • Irrigation Engineer for Supervision (Dzongkhag) • Construction Materials (DRDS, MOA) • Skilled Labor (Mason, Carpenter etc.) • Unskilled Labor (WUA) • Project Cost Nu. 0.66 mil. • Maintenance by Water Users Association |
| Output | The existing irrigation facilities are rehabilitated to attain the food crop production increase. (canal length=4.0km, water management improvement) |
| Period (Tentative) | <ul style="list-style-type: none"> • Survey and Plan 2003.10~2003.12 • Rehabilitation 2004.1~2004.5 • Maintenance 2004.6~ |
| Related Program / Sub-program (How) | <ul style="list-style-type: none"> • Program for Food Crop Production Increase/Food Security SP, Paddy-rice Production SP, Post-harvest Technology Training SP(They will be executed together with Irrigation Development SP) • Extension Strengthening Program/Extension Strengthening for Food Crop SP(Extension will be executed to the beneficiaries of rehabilitated irrigation facilities) |
| Project Justification | <ul style="list-style-type: none"> • Environment: IEE was conducted in the Master Plan. As this is actually rehabilitation of irrigation facilities, it will be enough to assess by only the routine environmental checking by NEC to be executed before the commencement of rehabilitation and an authorization issuance of NEC will be applied by Dzongkhag. • Efficiency: Reasonable range of rehabilitation cost of canal per km is about 132,000 Nu estimated in 9th FYP in the maximum limitation. • Consistency with upper plan/program: This is based on the program of MOA. • Sustainability: The participation of beneficiaries, maintenance fund contribution and so on should be confirmed on the basis of the national irrigation policy procedural manual prepared by MOA |

III. Implementing Organization

(a) Organization chart (organogram)



(b) General Role and Responsibility of Stakeholders

| Stakeholder | | General Role and Responsibility |
|---------------|---|---|
| National | DRDS, MOA | Responsible for the program comprehensively in terms of finance, technical backstopping and coordination with other stakeholders. |
| Dzongkhag | Engineering Office/ Agriculture Office | Actually supervises WUA from rehabilitation and maintenance by WUA including accounting of the program. |
| Gewog | GYT | Formulate the Gewog rehabilitation plan and evaluate the program in the plan, and based on this, made the official request letter and submit it to Dzongkhag. |
| Beneficiaries | WUA | Directly engages in the program and participate the rehabilitation and maintenance from at the inspection of facilities as unskilled labor free of charge. |

IV. Action Plan (sequent)

| Required Action (WHAT) | | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|------------------------|---|-------------------------------|---|
| 1 | Consensus in GYT | GYT | The request of irrigation facilities rehabilitation from WUA will be discussed in GYT and with the consensus will be proceeded to Dzongkhag. |
| 2 | Official request (IRRIFORM.01) for rehabilitation | GYT | The GYT member will prepare a request letter and the letter with the signature of Gup will be officially submitted to Dzongkhag with necessary information for evaluation (required works, contribution by Gewogs or beneficiaries, etc.) |
| 3 | Inspection of facilities to be rehabilitated | Dzongkhag/ WUA | The inspection will be executed to find out whether the proposed request meets the basic requirements for government assistance. The rehabilitation identification report will be made for further procedure referring to Module 1. |
| 4 | Consensus in DYT | Dzongkhag / DYT | The request will be discussed based on the rehabilitation identification report, and with the consensus and Dzongda's approval will be proceeded to MOA and MOF for further procedure for budget allocation. |

| Required Action (WHAT) | | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|------------------------|---|-------------------------------|--|
| 5 | Budget allocation for rehabilitation survey | Dzongkhag | The budget for rehabilitation survey will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 6 | Survey and plan for rehabilitation | Dzongkhag | Rehabilitation survey will be executed to determine whether the proposed request is reasonable and necessary or not. The rehabilitation survey report with a detailed rehabilitation plan, countermeasures for the problems and estimation of the rehabilitation cost will be made referring to Module 2. |
| 7 | Budget allocation for rehabilitation | Dzongkhag | The budget for rehabilitation of irrigation facilities will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 8 | Procurement of materials and tools | Dzongkhag | Supplying materials and tools including technical backstopping from Dzongkhag for rehabilitation of irrigation facilities will be arranged based on the requisition of Dzongkhag in Implementation. |
| 9 | Overall management of rehabilitation | Dzongkhag | The rehabilitation of irrigation facilities will be carried out under the management of Dzongkhag in Implementation. |
| 10 | Arrangement of unskilled labor | WUA | WUA shall provide free unskilled labor in accordance with the arrangement of the site in-charge. |
| 11 | Reserving fund for maintenance works | WUA | For the following maintenance, the fund will be reserved in the system of WUA as same as the proposed irrigation scheme. |
| 12 | Routine maintenance | WUA | Routine maintenance like canal cleaning, weeding will be periodically and timely carried out under the guidance of the site in-charge after rehabilitation. |
| 13 | Periodical maintenance | WUA | Annual maintenance for natural calamity and unexpected disasters will be periodically carried out under the guidance of the site in-charge after rehabilitation. |
| 14 | Periodical repair works | MOA/ WUA | Major repair will be executed using construction machinery to be arranged by CMU/MOA and Dzongkhag every five year after rehabilitation, if necessary. |
| 15 | Establishment period inspection visit | Dzongkhag | Inspection and evaluation of the irrigation system will be executed each year during the establishment period (in five years after the rehabilitation) to monitor and evaluate the condition of the irrigation system, functioning WUA, crop productivity and assess the need for further Dzongkhag support in accordance with Module 8. |
| 16 | Dzongkhag water users' association conference | Dzongkhag | This provides a forum where representatives of different WUAs can present and discuss progress, programs and problems. each year during the establishment period(in five years after the rehabilitation) During the conference measures to overcome certain problems facing the WUAs can be framed jointly by the concerned WUA and the Dzongkhag irrigation sector in accordance with Module 9. |

Note: FORM and Module are procedure regulated for irrigation facilities development by MOA, the irrigation facilities rehabilitation program will follow this procedure as well.

V. Schedule

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|--------|------|------|------|------|------|------|------|------|------|------|------|
| 1 | Consensus in GYT | 2006.4 | | | | | □ | | | | | | |
| 2 | Official request (IRRIFORM.01) for rehabilitation | 2006.4 | | | | | □ | | | | | | |
| 3 | Inspection of facilities to be rehabilitated | 2006.5 | | | | | □ | | | | | | |

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|-------------------|------|------|------|------|------|------|------|------|------|------|------|
| 4 | Consensus in DYT | 2006.5 | | | | | □ | | | | | | |
| 5 | Budget allocation for rehabilitation survey | 2006.6 | | | | | □ | | | | | | |
| 6 | Survey and plan estimation for rehabilitation | 2006.7 - 2007.3 | | | | | □ | | | | | | |
| 7 | Budget allocation for rehabilitation | 2007.3 | | | | | □ | | | | | | |
| 8 | Procurement of materials and tools | 2007.4 - 2007.6 | | | | | □ | | | | | | |
| 9 | Overall management of rehabilitation | 2007.7 - 2010.6 | | | | | | □ | | | | | |
| 10 | Arrangement of unskilled labor | 2007.7 - 2010.6 | | | | | | □ | | | | | |
| 11 | Reserving fund for maintenance works | 2010.1 - | | | | | | | | □ | | | |
| 12 | Routine maintenance | 2010.7 - | | | | | | | | □ | | | |
| 13 | Periodical maintenance | 2011.7 - | | | | | | | | | □ | □ | |
| 14 | Periodical repair works | 2015.6 - | | | | | | | | | | | |
| 15 | Establishment period inspection visit | 2010.11 - 2011.11 | | | | | | | | | □ | □ | □ |
| 16 | Dzongkhag water users' association conference | 2011.1 - | | | | | | | | | □ | □ | |

VI. Implementation and Monitoring System

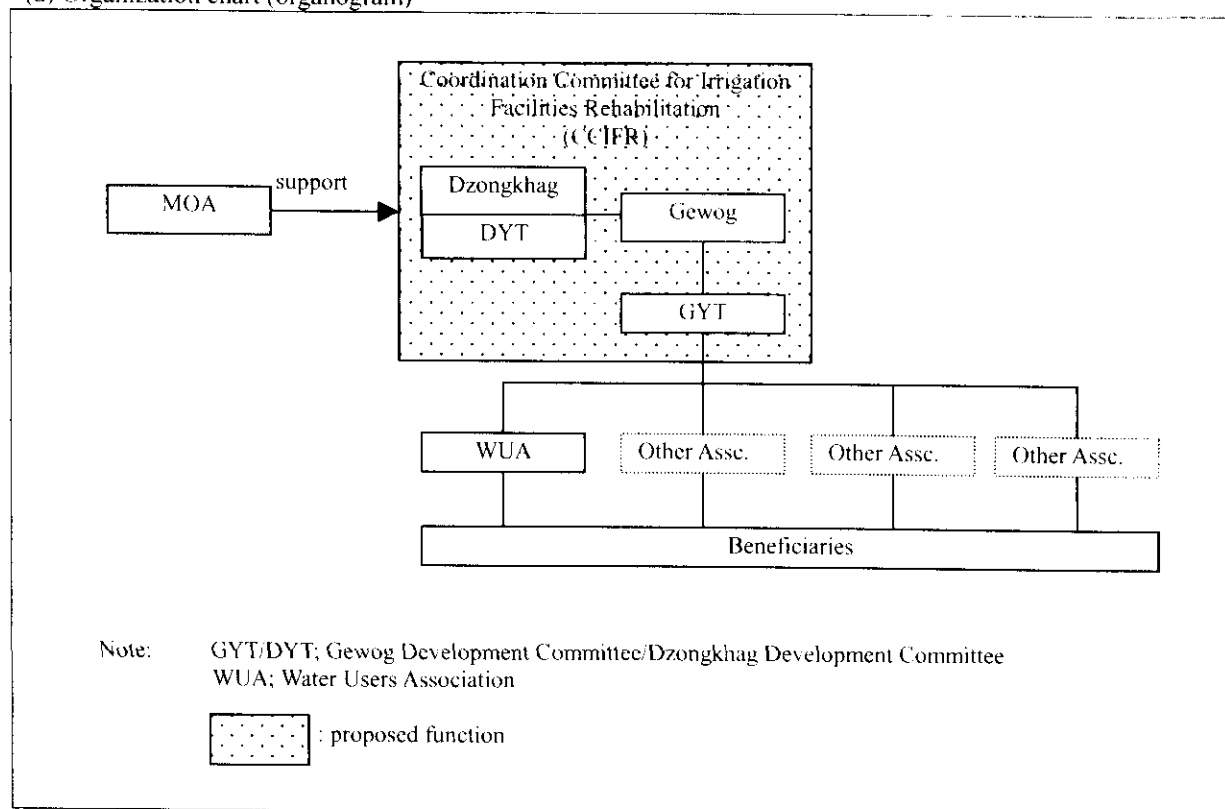
| Action | Plan | |
|---|-------|--|
| Progress Management of A/P | WHO | DE/DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Engineering/Agriculture Office |
| | HOW | Monthly Report prepared by Site Engineer of Dzongkhag |
| Budget Management at Preparatory Stage | WHO | Superintending Engineer, DRDS, MOA |
| | WHEN | Every Financial Year |
| | WHERE | MOA Office, Thimphu |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at Implementation Stage | WHO | DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Agriculture Office |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at O&M Stage | WHO | Chairperson, WUA |
| | WHEN | Monthly basis |
| | WHERE | Accountant, WUA |
| | HOW | Constitution/Bylaws enacted in WUA |
| 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/ Agriculture Office, Dzongkhag at implementation stage/ WUA Office 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 Office discusses with the beneficiaries. Accident, Participation, Dispute: WUA Office discusses among the beneficiaries and third party. Manpower: DRDS, MOA discusses with the organization concerned. |
| | | |
| | | |

1.1.3 Tsholing Scheme (Rehabilitation)

| I. General | | Sheet No. | AP-3 |
|-------------------------------------|---|---------------------|---|
| Program | Program for Food Crop Production Increase / Gangzur / Lhuntse | | |
| Sub-program | Irrigation Development Sub Program (Rehabilitation, Tsholing) | | |
| Stakeholders | Level | Organization / Name | Contact Person |
| | National | MOA | Mr. Kaylzang Tshering (SE, DRDS, 02-322228) |
| | Dzongkhag | Lhuntse | Mr. Om Nath Giri (DE, 04-545128) Mr. Deepak Rai (DAO, 04-545127) |
| | Gewog | GYT | Mr. (Gup) |
| | Beneficiaries | WUA (14HH) | Mr. (Chairman) |
| II. Program/Sub-program | | | |
| Target | To increase food crop production, irrigated area=12.1ha | | |
| Activities | <ul style="list-style-type: none"> • Survey, Plan and Cost estimation • Rehabilitation of irrigation facilities • Maintenance by Water Users Association • Procurement of construction materials and tools • Financial arrangement | | |
| Input | <ul style="list-style-type: none"> • Surveyor (Dzongkhag) • Irrigation Engineer for Rehabilitation Plan (Dzongkhag) • Irrigation Engineer for Supervision (Dzongkhag) • Construction Materials (DRDS, MOA) • Skilled Labor (Mason, Carpenter etc.) • Unskilled Labor (WUA) • Project Cost Nu. 6.6 mil. • Maintenance by Water Users Association | | |
| Output | The existing irrigation facilities are rehabilitated to attain the food crop production increase. (canal length=5.0km, water management improvement) | | |
| Period (Tentative) | <ul style="list-style-type: none"> • Survey and Plan 2003.10~2003.12 • Rehabilitation 2004.1~2004.5 • Maintenance 2004.6~ | | |
| Related Program / Sub-program (How) | <ul style="list-style-type: none"> • Program for Food Crop Production Increase/Food Security SP, Paddy-rice Production SP, Post-harvest Technology Training SP(They will be executed together with Irrigation Development SP) • Extension Strengthening Program/Extension Strengthening for Food Crop SP(Extension will be executed to the beneficiaries of rehabilitated irrigation facilities) | | |
| Project Justification | <ul style="list-style-type: none"> • Environment: IEE was conducted in the Master Plan. As this is actually rehabilitation of irrigation facilities, it will be enough to assess by only the routine environmental checking by NEC to be executed before the commencement of rehabilitation and an authorization issuance of NEC will be applied by Dzongkhag. • Efficiency: Reasonable range of rehabilitation cost of canal per km is about 132,000 Nu estimated in 9th FYP in the maximum limitation. • Consistency with upper plan/program: This is based on the program of MOA. • Sustainability: The participation of beneficiaries, maintenance fund contribution and so on should be confirmed on the basis of the national irrigation policy procedural manual prepared by MOA. | | |

III. Implementing Organization

(a) Organization chart (organogram)



(b) General Role and Responsibility of Stakeholders

| Stakeholder | | General Role and Responsibility |
|---------------|---|--|
| National | DRDS, MOA | Responsible for the program comprehensively in terms of finance, technical backstopping and coordination with other stakeholders. |
| Dzyongkhag | Engineering Office/ Agriculture Office | Actually supervises WUA from rehabilitation and maintenance by WUA including accounting of the program. |
| Gewog | GYT | Formulate the Gewog rehabilitation plan and evaluate the program in the plan, and based on this, made the official request letter and submit it to Dzyongkhag. |
| Beneficiaries | WUA | Directly engages in the program and participate the rehabilitation and maintenance from at the inspection of facilities as unskilled labor free of charge. |

IV. Action Plan (sequent)

| Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|---|-------------------------------|--|
| 1 Consensus in GYT | GYT | The request of irrigation facilities rehabilitation from WUA will be discussed in GYT and with the consensus will be proceeded to Dzyongkhag. |
| 2 Official request (IRRIFORM.01) for rehabilitation | GYT | The GYT member will prepare a request letter and the letter with the signature of Gup will be officially submitted to Dzyongkhag with necessary information for evaluation (required works, contribution by Gewogs or beneficiaries, etc.) |
| 3 Inspection of facilities to be rehabilitated | Dzyongkhag/ WUA | The inspection will be executed to find out whether the proposed request meets the basic requirements for government assistance. The rehabilitation identification report will be made for further procedure referring to Module 1. |
| 4 Consensus in DYT | Dzyongkhag / DYT | The request will be discussed based on the rehabilitation identification report, and with the consensus and Dzyongda's approval will be proceeded to MOA and MOF for further procedure for budget allocation. |
| 5 Budget allocation for | Dzyongkhag | The budget for rehabilitation survey will be arranged in MOF after |

| | Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|----|---|-------------------------------|--|
| | rehabilitation survey | | scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 6 | Survey and plan for rehabilitation | Dzongkhag | Rehabilitation survey will be executed to determine whether the proposed request is reasonable and necessary or not. The rehabilitation survey report with a detailed rehabilitation plan, countermeasures for the problems and estimation of the rehabilitation cost will be made referring to Module 2. |
| 7 | Budget allocation for rehabilitation | Dzongkhag | The budget for rehabilitation of irrigation facilities will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 8 | Procurement of materials and tools | Dzongkhag | Supplying materials and tools including technical backstopping from Dzongkhag for rehabilitation of irrigation facilities will be arranged based on the requisition of Dzongkhag in Implementation. |
| 9 | Overall management of rehabilitation | Dzongkhag | The rehabilitation of irrigation facilities will be carried out under the management of Dzongkhag in Implementation. |
| 10 | Arrangement of unskilled labor | WUA | WUA shall provide free unskilled labor in accordance with the arrangement of the site in-charge. |
| 11 | Reserving fund for maintenance works | WUA | For the following maintenance, the fund will be reserved in the system of WUA as same as the proposed irrigation scheme. |
| 12 | Routine maintenance | WUA | Routine maintenance like canal cleaning, weeding will be periodically and timely carried out under the guidance of the site in-charge after rehabilitation. |
| 13 | Periodical maintenance | WUA | Annual maintenance for natural calamity and unexpected disasters will be periodically carried out under the guidance of the site in-charge after rehabilitation. |
| 14 | Periodical repair works | MOA/ WUA | Major repair will be executed using construction machinery to be arranged by CMU/MOA and Dzongkhag every five year after rehabilitation, if necessary. |
| 15 | Establishment period inspection visit | Dzongkhag | Inspection and evaluation of the irrigation system will be executed each year during the establishment period (in five years after the rehabilitation) to monitor and evaluate the condition of the irrigation system, functioning WUA, crop productivity and assess the need for further Dzongkhag support in accordance with Module 8. |
| 16 | Dzongkhag water users' association conference | Dzongkhag | This provides a forum where representatives of different WUAs can present and discuss progress, programs and problems. each year during the establishment period(in five years after the rehabilitation) During the conference measures to overcome certain problems facing the WUAs can be framed jointly by the concerned WUA and the Dzongkhag irrigation sector according to Module 9. |

Note: FORM and Module are procedure regulated for irrigation facilities development by MOA, the irrigation facilities rehabilitation program will follow this procedure as well.

V. Schedule

| Required Action (WHAT) | | Period | 20 02 | 20 03 | 20 04 | 20 05 | 20 06 | 20 07 | 20 08 | 20 09 | 20 10 | 20 11 | 20 12 |
|---------------------------|---|----------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1 | Consensus in GYT | 2006.4 | | | | | □ | | | | | | |
| 2 | Official request (IRRIFORM.01) for rehabilitation | 2006.4 | | | | | □ | | | | | | |
| 3 | Inspection of facilities to be rehabilitated | 2006.5 | | | | | □ | | | | | | |
| 4 | Consensus in DYT | 2006.5 | | | | | □ | | | | | | |
| 5 | Budget allocation for rehabilitation survey | 2006.6 | | | | | □ | | | | | | |
| 6 | Survey and plan estimation for rehabilitation | 2006.7 - 2007.3 | | | | | □ | | | | | | |
| 7 | Budget allocation for rehabilitation | 2007.3 | | | | | | □ | | | | | |
| 8 | Procurement of materials and tools | 2007.4 - 2007.6 | | | | | | □ | | | | | |
| 9 | Overall management of rehabilitation | 2007.7 - 20010.6 | | | | | | | □ | | | | |
| 10 | Arrangement of unskilled labor | 2007.7 - 2010.6 | | | | | | | □ | | | | |
| 11 | Reserving fund for maintenance works | 2010.1 - | | | | | | | | | □ | | |
| 12 | Routine maintenance | 2010.7 - | | | | | | | | | □ | | |
| 13 | Periodical maintenance | 2011.7 - | | | | | | | | | | □ | □ |
| 14 | Periodical repair works | 2015.6 - | | | | | | | | | | | |
| 15 | Establishment period inspection visit | 2010.11 - 2011.11 | | | | | | | | | | □ | □ |
| 16 | Dzongkhag water users' association conference | 2011.1 - | | | | | | | | | | □ | □ |

VI. Implementation and Monitoring System

| Action | Plan | |
|---|-------|--|
| Progress Management of A/P | WHO | DE/DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Engineering/Agriculture Office |
| | HOW | Monthly Report prepared by Site Engineer of Dzongkhag |
| Budget Management at Preparatory Stage | WHO | Superintending Engineer, DRDS, MOA |
| | WHEN | Every Financial Year |
| | WHERE | MOA Office, Thimphu |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at Implementation Stage | WHO | DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Agriculture Office |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at O&M Stage | WHO | Chairperson, WUA |
| | WHEN | Monthly basis |
| | WHERE | Accountant, WUA |
| | HOW | Constitution/Bylaws enacted in WUA |
| 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/ Agriculture Office, Dzongkhag at implementation stage/ WUA Office 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 Office discusses with the beneficiaries. Accident, Participation, Dispute: WUA Office discusses among the beneficiaries and third party. Manpower: DRDS, MOA discusses with the organization concerned. |

1.1.4 Shawa (Chuthigang) Scheme (Rehabilitation)

I. General

Sheet No.

AP-4

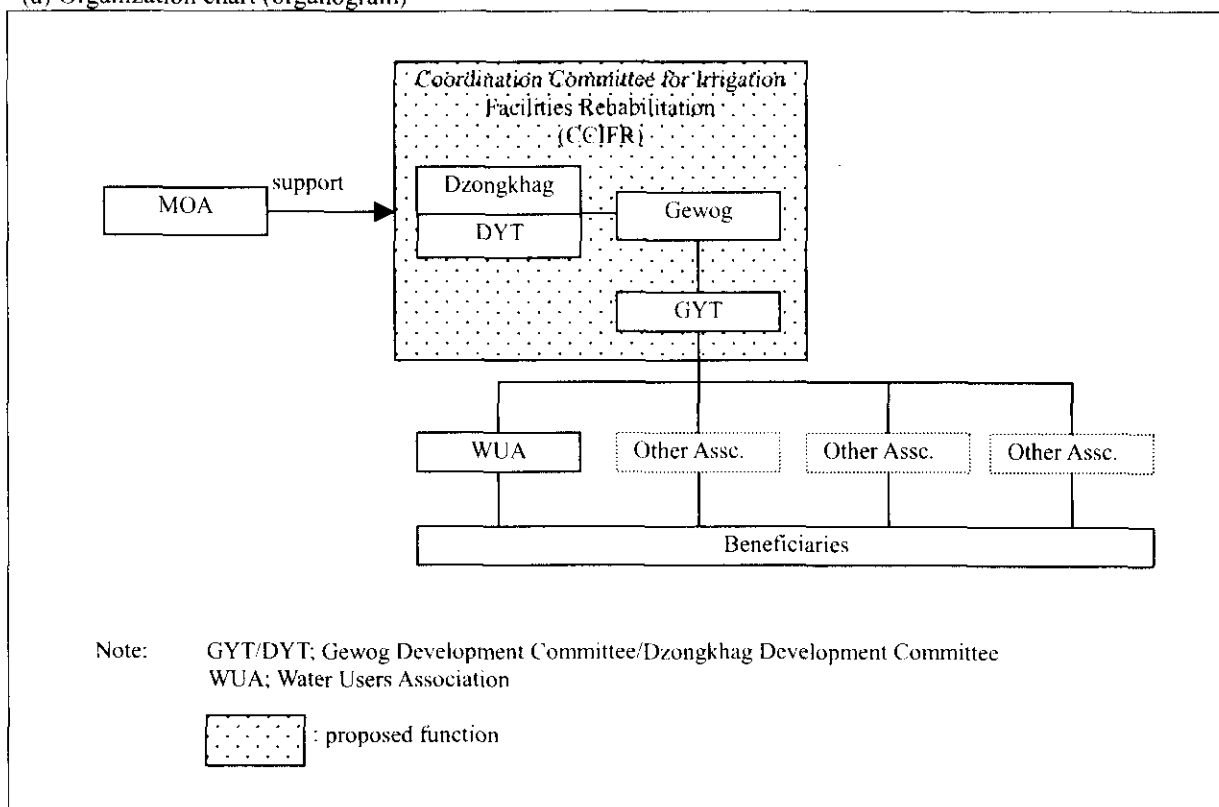
| | | | |
|--------------|--|---------------------|---|
| Program | Program for Food Crop Production Increase / Gangzur / Lhuntse | | |
| Sub-program | Irrigation Development Sub Program (Rehabilitation, Shawa(Chuthigang)) | | |
| Stakeholders | Level | Organization / Name | Contact Person |
| | National | MOA | Mr.Kaylzag Tshering (SE. DRDS, 02-322228) |
| | Dzongkhag | Lhuntse | Mr.Om Nath Giri (DE, 04-545128) Mr.Deepak Rai (DAO, 04-545127) |
| | Gewog | GYT | Mr. (Gup) |
| | Beneficiaries | WUA(30HH) | Mr. (Chairman) |

II. Program/Sub-program

| | |
|-------------------------------------|---|
| Target | To increase food crop production, irrigated area=18.2ha |
| Activities | <ul style="list-style-type: none"> • Survey, Plan and Cost estimation • Rehabilitation of irrigation facilities • Maintenance by Water Users Association • Procurement of construction materials and tools • Financial arrangement |
| Input | <ul style="list-style-type: none"> • Surveyor (Dzongkhag) • Irrigation Engineer for Rehabilitation Plan (Dzongkhag) • Irrigation Engineer for Supervision (Dzongkhag) • Construction Materials (DRDS, MOA) • Skilled Labor (Mason, Carpenter etc.) • Unskilled Labor (WUA) • Project Cost Nu. 0.264 mil. • Maintenance by Water Users Association |
| Output | The existing irrigation facilities are rehabilitated to attain the food crop production increase. (canal length=2.0km, water management improvement) |
| Period (Tentative) | <ul style="list-style-type: none"> • Survey and Plan 2003.10~2003.12 • Rehabilitation 2004.1~2004.5 • Maintenance 2004.6~ |
| Related Program / Sub-program (How) | <ul style="list-style-type: none"> • Program for Food Crop Production Increase/Food Security SP, Paddy-rice Production SP, Post-harvest Technology Training SP(They will be executed together with Irrigation Development SP) • Extension Strengthening Program/Extension Strengthening for Food Crop SP(Extension will be executed to the beneficiaries of rehabilitated irrigation facilities) |
| Project Justification | <ul style="list-style-type: none"> • Environment: IEE was conducted in the Master Plan. As this is actually rehabilitation of irrigation facilities, it will be enough to assess by only the routine environmental checking by NEC to be executed before the commencement of rehabilitation and an authorization issuance of NEC will be applied by Dzongkhag. • Efficiency: Reasonable range of rehabilitation cost of canal per km is about 132,000 Nu estimated in 9th FYP in the maximum limitation. • Consistency with upper plan/program: This is based on the program of MOA. • Sustainability: The participation of beneficiaries, maintenance fund contribution and so on should be confirmed on the basis of the national irrigation policy procedural manual prepared by MOA. |

III. Implementing Organization

(a) Organization chart (organogram)



(b) General Role and Responsibility of Stakeholders

| Stakeholder | | General Role and Responsibility |
|---------------|---|---|
| National | DRDS, MOA | Responsible for the program comprehensively in terms of finance, technical backstopping and coordination with other stakeholders. |
| Dzungkhag | Engineering Office/ Agriculture Office | Actually supervises WUA from rehabilitation and maintenance by WUA including accounting of the program. |
| Gewog | GYT | Formulate the Gewog rehabilitation plan and evaluate the program in the plan, and based on this, made the official request letter and submit it to Dzungkhag. |
| Beneficiaries | WUA | Directly engages in the program and participate the rehabilitation and maintenance from at the inspection of facilities as unskilled labor free of charge. |

IV. Action Plan (sequent)

| Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|---|-------------------------------|---|
| 1 Consensus in GYT | GYT | The request of irrigation facilities rehabilitation from WUA will be discussed in GYT and with the consensus will be proceeded to Dzungkhag. |
| 2 Official request (IRRIFORM.01) for rehabilitation | GYT | The GYT member will prepare a request letter and the letter with the signature of Gup will be officially submitted to Dzungkhag with necessary information for evaluation (required works, contribution by Gewogs or beneficiaries, etc.) |
| 3 Inspection of facilities to be rehabilitated | Dzungkhag/ WUA | The inspection will be executed to find out whether the proposed request meets the basic requirements for government assistance. The rehabilitation identification report will be made for further procedure referring to Module 1. |
| 4 Consensus in DYT | Dzungkhag / DYT | The request will be discussed based on the rehabilitation identification report, and with the consensus and Dzungda's approval will be proceeded to MOA and MOF for further procedure for budget allocation. |
| 5 Budget allocation for | Dzungkhag | The budget for rehabilitation survey will be arranged in MOF after |

| Required Action (WHAT) | | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|------------------------|---|-------------------------------|--|
| | rehabilitation survey | | scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 6 | Survey and plan for rehabilitation | Dzongkhag | Rehabilitation survey will be executed to determine whether the proposed request is reasonable and necessary or not. The rehabilitation survey report with a detailed rehabilitation plan, countermeasures for the problems and estimation of the rehabilitation cost will be made referring to Module 2. |
| 7 | Budget allocation for rehabilitation | Dzongkhag | The budget for rehabilitation of irrigation facilities will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 8 | Procurement of materials and tools | Dzongkhag | Supplying materials and tools including technical backstopping from Dzongkhag for rehabilitation of irrigation facilities will be arranged based on the requisition of Dzongkhag in Implementation. |
| 9 | Overall management of rehabilitation | Dzongkhag | The rehabilitation of irrigation facilities will be carried out under the management of Dzongkhag in Implementation. |
| 10 | Arrangement of unskilled labor | WUA | WUA shall provide free unskilled labor in accordance with the arrangement of the site in-charge. |
| 11 | Reserving fund for maintenance works | WUA | For the following maintenance, the fund will be reserved in the system of WUA as same as the proposed irrigation scheme. |
| 12 | Routine maintenance | WUA | Routine maintenance like canal cleaning, weeding will be periodically and timely carried out under the guidance of the site in-charge after rehabilitation. |
| 13 | Periodical maintenance | WUA | Annual maintenance for natural calamity and unexpected disasters will be periodically carried out under the guidance of the site in-charge after rehabilitation. |
| 14 | Periodical repair works | MOA/ WUA | Major repair will be executed using construction machinery to be arranged by CMU/MOA and Dzongkhag every five year after rehabilitation, if necessary. |
| 15 | Establishment period inspection visit | Dzongkhag | Inspection and evaluation of the irrigation system will be executed each year during the establishment period (in five years after the rehabilitation) to monitor and evaluate the condition of the irrigation system, functioning WUA, crop productivity and assess the need for further Dzongkhag support in accordance with Module 8. |
| 16 | Dzongkhag water users' association conference | Dzongkhag | This provides a forum where representatives of different WUAs can present and discuss progress, programs and problems. each year during the establishment period(in five years after the rehabilitation) During the conference measures to overcome certain problems facing the WUAs can be framed jointly by the concerned WUA and the Dzongkhag irrigation sector in accordance with Module 9. |

Note: FORM and Module are procedure regulated for irrigation facilities development by MOA, the irrigation facilities rehabilitation program will follow this procedure as well.

V. Schedule

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|--------|------|------|------|------|------|------|------|------|------|------|------|
| 1 | Consensus in GYT | 2004.4 | | | □ | | | | | | | | |
| 2 | Official request (IRRIFORM.01) for rehabilitation | 2004.4 | | | □ | | | | | | | | |
| 3 | Inspection of facilities to be rehabilitated | 2004.5 | | | □ | | | | | | | | |

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|-------------------|------|------|------|------|------|------|------|------|------|------|------|
| 4 | Consensus in DYT | 2004.5 | | | □ | | | | | | | | |
| 5 | Budget allocation for rehabilitation survey | 2004.6 | | | □ | | | | | | | | |
| 6 | Survey and plan estimation for rehabilitation | 2004.7 - 2005.3 | | | □ | | | | | | | | |
| 7 | Budget allocation for rehabilitation | 2005.3 | | | | □ | | | | | | | |
| 8 | Procurement of materials and tools | 2005.4 - 2005.6 | | | | □ | | | | | | | |
| 9 | Overall management of rehabilitation | 2005.7 - 2007.6 | | | | | □ | | | | | | |
| 10 | Arrangement of unskilled labor | 2004.7 - 2007.6 | | | | | □ | | | | | | |
| 11 | Reserving fund for maintenance works | 2007.1 - | | | | | | □ | | | | | |
| 12 | Routine maintenance | 2007.7 - | | | | | | □ | | | | | |
| 13 | Periodical maintenance | 2008.7 - | | | | | | | □ | □ | □ | □ | □ |
| 14 | Periodical repair works | 2012.6 - | | | | | | | | | | | □ |
| 15 | Establishment period inspection visit | 2007.11 - 2011.11 | | | | | | □ | □ | □ | □ | □ | |
| 16 | Dzongkhag water users' association conference | 2008.1 - | | | | | | □ | □ | □ | □ | □ | |

VI. Implementation and Monitoring System

| Action | Plan | |
|---|-------|--|
| Progress Management of A/P | WHO | DE/DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Engineering/Agriculture Office |
| | HOW | Monthly Report prepared by Site Engineer of Dzongkhag |
| Budget Management at Preparatory Stage | WHO | Superintending Engineer, DRDS, MOA |
| | WHEN | Every Financial Year |
| | WHERE | MOA Office, Thimphu |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at Implementation Stage | WHO | DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Agriculture Office |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at O&M Stage | WHO | Chairperson, WUA |
| | WHEN | Monthly basis |
| | WHERE | Accountant, WUA |
| | HOW | Constitution/Bylaws enacted in WUA |
| 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/ Agriculture Office, Dzongkhag at implementation stage/ WUA Office 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 Office discusses with the beneficiaries. Accident, Participation, Dispute: WUA Office discusses among the beneficiaries and third party. Manpower: DRDS, MOA discusses with the organization concerned. |

1.1.5 Jang Scheme (Rehabilitation)

I. General

Sheet No. AP-5

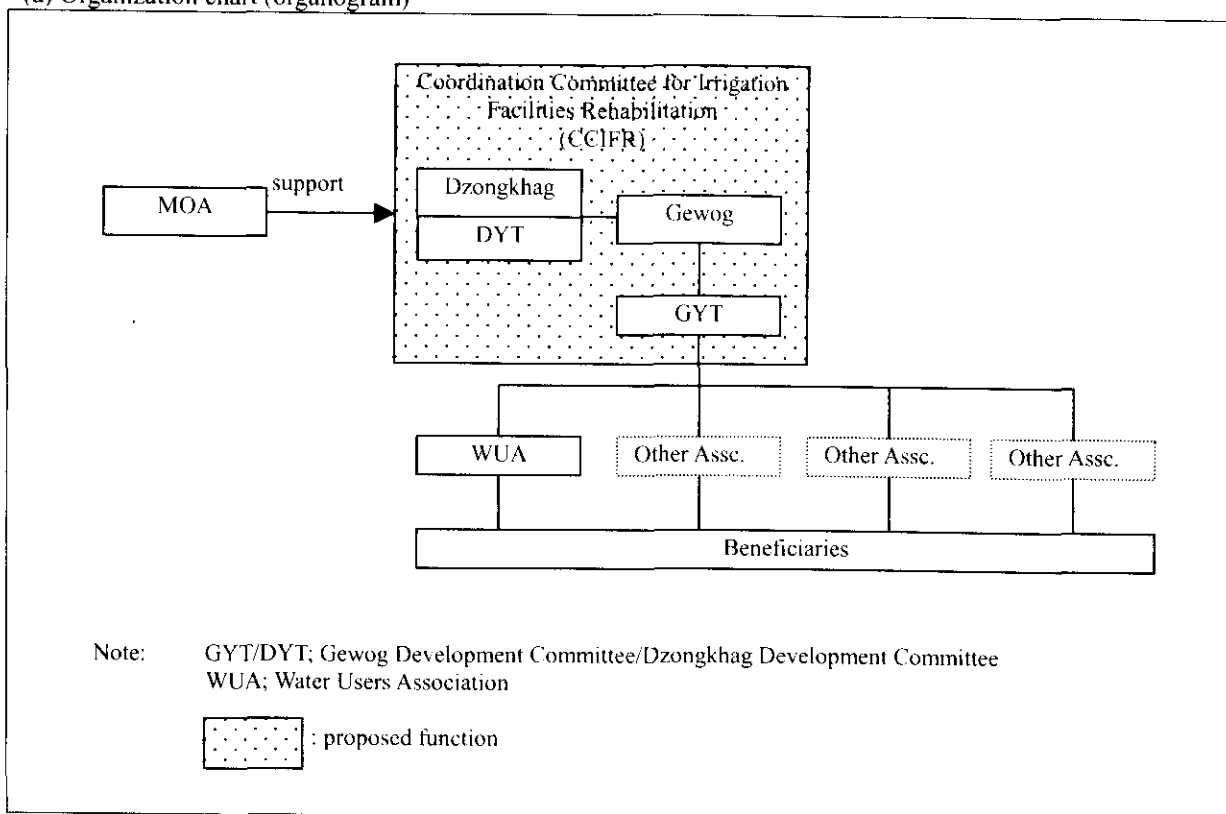
| | | | |
|--------------|--|---------------------|---|
| Program | Program for Food Crop Production Increase / Gangzur / Lhuntse | | |
| Sub-program | Irrigation Development Sub Program (Rehabilitation, Jang) | | |
| Stakeholders | Level | Organization / Name | Contact Person |
| | National | MOA | Mr.Kaylzang Tshering (SE. DRDS, 02-322228) |
| | Dzongkhag | Lhuntse | Mr.Om Nath Giri (DE, 04-545128) Mr.Deepak Rai (DAO, 04-545127) |
| | Gewog | GYT | Mr. canal length=4.0km, water management improvement (Gup) |
| | Beneficiaries | WUA (45HH) | Mr. (Chairman) |

II. Program/Sub-program

| | |
|-------------------------------------|---|
| Target | To increase food crop production, irrigated area = 20.2 ha |
| Activities | <ul style="list-style-type: none"> • Survey, Plan and Cost estimation • Rehabilitation of irrigation facilities • Maintenance by Water Users Association • Procurement of construction materials and tools • Financial arrangement |
| Input | <ul style="list-style-type: none"> • Surveyor (Dzongkhag) • Irrigation Engineer for Rehabilitation Plan (Dzongkhag) • Irrigation Engineer for Supervision (Dzongkhag) • Construction Materials (DRDS, MOA) • Skilled Labor (Mason, Carpenter etc.) • Unskilled Labor (WUA) • Project Cost Nu. 0.396 mil. • Maintenance by Water Users Association |
| Output | The existing irrigation facilities are rehabilitated to attain the food crop production increase. (canal length=3.0km, water management improvement) |
| Period (Tentative) | <ul style="list-style-type: none"> • Survey and Plan 2003.10~2003.12 • Rehabilitation 2004.1~2004.5 • Maintenance 2004.6~ |
| Related Program / Sub-program (How) | <ul style="list-style-type: none"> • Program for Food Crop Production Increase/Food Security SP, Paddy-rice Production SP, Post-harvest Technology Training SP(They will be executed together with Irrigation Development SP) • Extension Strengthening Program/Extension Strengthening for Food Crop SP(Extension will be executed to the beneficiaries of rehabilitated irrigation facilities) |
| Project Justification | <ul style="list-style-type: none"> • Environment: IEE was conducted in the Master Plan. As this is actually rehabilitation of irrigation facilities, it will be enough to assess by only the routine environmental checking by NEC to be executed before the commencement of rehabilitation and an authorization issuance of NEC will be applied by Dzongkhag. • Efficiency: Reasonable range of rehabilitation cost of canal per km is about 132,000 Nu estimated in 9th FYP in the maximum limitation. • Consistency with upper plan/program: This is based on the program of MOA. • Sustainability: The participation of beneficiaries, maintenance fund contribution and so on should be confirmed on the basis of the national irrigation policy procedural manual prepared by MOA. |

III. Implementing Organization

(a) Organization chart (organogram)



(b) General Role and Responsibility of Stakeholders

| Stakeholder | | General Role and Responsibility |
|---------------|---|---|
| National | DRDS, MOA | Responsible for the program comprehensively in terms of finance, technical backstopping and coordination with other stakeholders. |
| Dzungkhag | Engineering Office/ Agriculture Office | Actually supervises WUA from rehabilitation and maintenance by WUA including accounting of the program. |
| Gewog | GYT | Formulate the Gewog rehabilitation plan and evaluate the program in the plan, and based on this, made the official request letter and submit it to Dzungkhag. |
| Beneficiaries | WUA | Directly engages in the program and participate the rehabilitation and maintenance from at the inspection of facilities as unskilled labor free of charge. |

IV. Action Plan (sequent)

| Required Action (WHAT) | | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|------------------------|---|-------------------------------|---|
| 1 | Consensus in GYT | GYT | The request of irrigation facilities rehabilitation from WUA will be discussed in GYT and with the consensus will be proceeded to Dzungkhag. |
| 2 | Official request (IRRIFORM.01) for rehabilitation | GYT | The GYT member will prepare a request letter and the letter with the signature of Gup will be officially submitted to Dzungkhag with necessary information for evaluation (required works, contribution by Gewogs or beneficiaries, etc.) |
| 3 | Inspection of facilities to be rehabilitated | Dzungkhag/ WUA | The inspection will be executed to find out whether the proposed request meets the basic requirements for government assistance. The rehabilitation identification report will be made for further procedure referring to Module 1. |
| 4 | Consensus in DYT | Dzungkhag / DYT | The request will be discussed based on the rehabilitation identification report, and with the consensus and Dzungda's approval will be proceeded to MOA and MOF for further procedure for budget allocation. |
| 5 | Budget allocation for | Dzungkhag | The budget for rehabilitation survey will be arranged in MOF after |

| Required Action (WHAT) | | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|------------------------|---|-------------------------------|--|
| | rehabilitation survey | | scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 6 | Survey and plan for rehabilitation | Dzongkhag | Rehabilitation survey will be executed to determine whether the proposed request is reasonable and necessary or not. The rehabilitation survey report with a detailed rehabilitation plan, countermeasures for the problems and estimation of the rehabilitation cost will be made referring to Module 2. |
| 7 | Budget allocation for rehabilitation | Dzongkhag | The budget for rehabilitation of irrigation facilities will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 8 | Procurement of materials and tools | Dzongkhag | Supplying materials and tools including technical backstopping from Dzongkhag for rehabilitation of irrigation facilities will be arranged based on the requisition of Dzongkhag in Implementation. |
| 9 | Overall management of rehabilitation | Dzongkhag | The rehabilitation of irrigation facilities will be carried out under the management of Dzongkhag in Implementation. |
| 10 | Arrangement of unskilled labor | WUA | WUA shall provide free unskilled labor in accordance with the arrangement of the site in-charge. |
| 11 | Reserving fund for maintenance works | WUA | For the following maintenance, the fund will be reserved in the system of WUA as same as the proposed irrigation scheme. |
| 12 | Routine maintenance | WUA | Routine maintenance like canal cleaning, weeding will be periodically and timely carried out under the guidance of the site in-charge after rehabilitation. |
| 13 | Periodical maintenance | WUA | Annual maintenance for natural calamity and unexpected disasters will be periodically carried out under the guidance of the site in-charge after rehabilitation. |
| 14 | Periodical repair works | MOA/ WUA | Major repair will be executed using construction machinery to be arranged by CMU/MOA and Dzongkhag every five year after rehabilitation, if necessary. |
| 15 | Establishment period inspection visit | Dzongkhag | Inspection and evaluation of the irrigation system will be executed each year during the establishment period (in five years after the rehabilitation) to monitor and evaluate the condition of the irrigation system, functioning WUA, crop productivity and assess the need for further Dzongkhag support in accordance with Module 8. |
| 16 | Dzongkhag water users' association conference | Dzongkhag | This provides a forum where representatives of different WUAs can present and discuss progress, programs and problems. each year during the establishment period(in five years after the rehabilitation) During the conference measures to overcome certain problems facing the WUAs can be framed jointly by the concerned WUA and the Dzongkhag irrigation sector in accordance with Module 9. |

Note: FORM and Module are procedure regulated for irrigation facilities development by MOA, the irrigation facilities rehabilitation program will follow this procedure as well.

V. Schedule

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|--------|------|------|------|------|------|------|------|------|------|------|------|
| 1 | Consensus in GYT | 2003.4 | | | | | | | | | | | |
| 2 | Official request (IRRIFORM.01) for rehabilitation | 2003.4 | | | | | | | | | | | |
| 3 | Inspection of facilities to be rehabilitated | 2003.5 | | | | | | | | | | | |

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|-------------------|------|------|------|------|------|------|------|------|------|------|------|
| 4 | Consensus in DYT | 2003.5 | | □ | | | | | | | | | |
| 5 | Budget allocation for rehabilitation survey | 2003.6 | | □ | | | | | | | | | |
| 6 | Survey and plan estimation for rehabilitation | 2003.7 - 2004.3 | | □ | | | | | | | | | |
| 7 | Budget allocation for rehabilitation | 2004.3 | | □ | | | | | | | | | |
| 8 | Procurement of materials and tools | 2004.4 - 2004.6 | | □ | | | | | | | | | |
| 9 | Overall management of rehabilitation | 2004.7 - 2006.6 | | | □ | | | | | | | | |
| 10 | Arrangement of unskilled labor | 2004.7 - 2006.6 | | | □ | | | | | | | | |
| 11 | Reserving fund for maintenance works | 2006.1 - | | | | | □ | □ | □ | □ | □ | □ | □ |
| 12 | Routine maintenance | 2006.7 - | | | | | □ | □ | □ | □ | □ | □ | □ |
| 13 | Periodical maintenance | 2007.7 - | | | | | | | | | | | |
| 14 | Periodical repair works | 2011.6 - | | | | | | | | | | □ | |
| 15 | Establishment period inspection visit | 2006.11 - 2010.11 | | | | | □ | □ | □ | □ | □ | | |
| 16 | Dzongkhag water users' association conference | 2007.1 - | | | | | □ | □ | □ | □ | □ | □ | □ |

VI. Implementation and Monitoring System

| Action | Plan | |
|---|-------|--|
| Progress Management of A/P | WHO | DE/DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Engineering/Agriculture Office |
| | HOW | Monthly Report prepared by Site Engineer of Dzongkhag |
| Budget Management at Preparatory Stage | WHO | Superintending Engineer, DRDS, MOA |
| | WHEN | Every Financial Year |
| | WHERE | MOA Office, Thimphu |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at Implementation Stage | WHO | DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Agriculture Office |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at O&M Stage | WHO | Chairperson, WUA |
| | WHEN | Monthly basis |
| | WHERE | Accountant, WUA |
| | HOW | Constitution/Bylaws enacted in WUA |
| 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/ Agriculture Office, Dzongkhag at implementation stage/ WUA Office 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 Office discusses with the beneficiaries. Accident, Participation, Dispute: WUA Office discusses among the beneficiaries and third party. Manpower: DRDS, MOA discusses with the organization concerned. |

1.1.6 Nimshong Scheme (Rehabilitation)

I. General

Sheet No.

AP-6

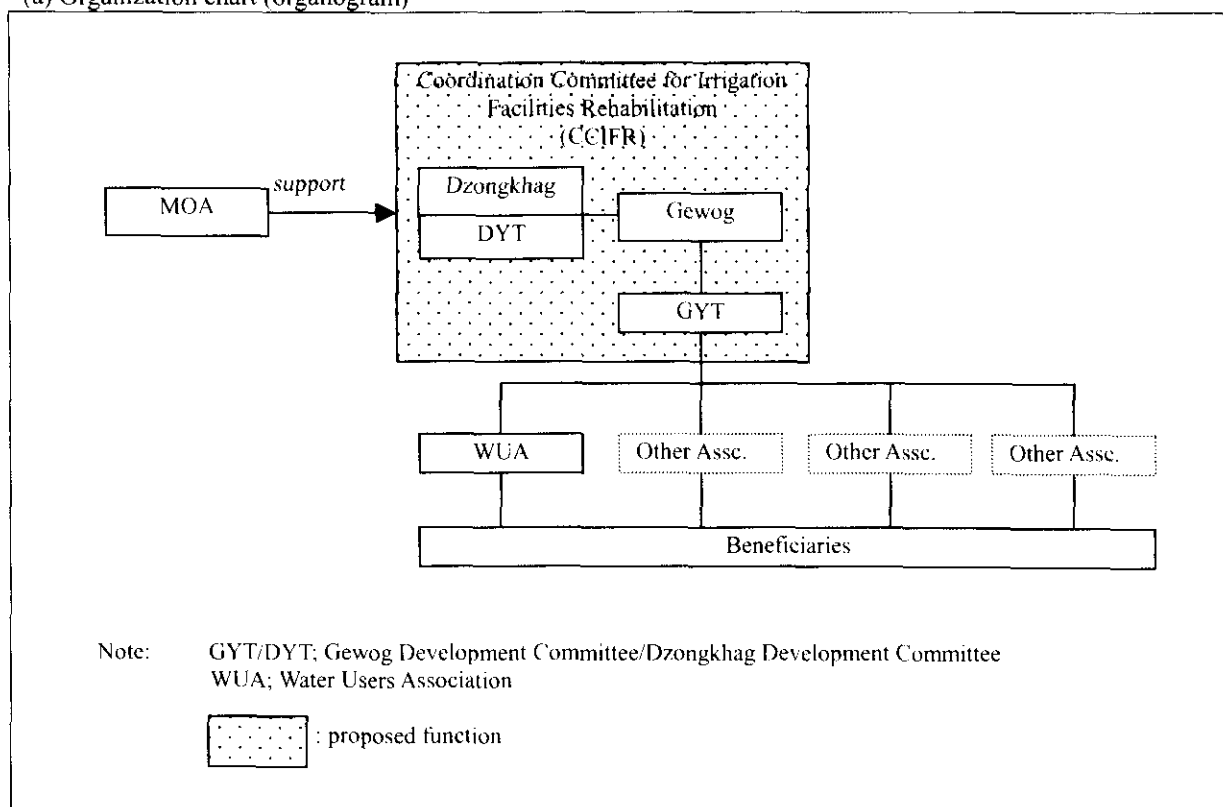
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|--------------|---|---------------------|---|
| Program | Program for Food Crop Production Increase / Gangzur / Lhuntse | | |
| Sub-program | Irrigation Development Sub Program (Rehabilitation on-going, Nimshong) | | |
| Stakeholders | Level | Organization / Name | Contact Person |
| | National | MOA | Mr.Kaylzang Tshering (SE. DRDS, 02-322228) |
| | Dzongkhag | Lhuntse | Mr.Om Nath Giri (DE, 04-545128) Mr.Deepak Rai (DAO, 04-545127) |
| | Gewog | GYT | Mr. (Gup) |
| | Beneficiaries | WUA (40HH) | Mr. (Chairman) |

II. Program/Sub-program

| | |
|-------------------------------------|---|
| Target | To increase food crop production, irrigated area = 40.5ha |
| Activities | <ul style="list-style-type: none"> • Survey, Plan and Cost estimation • Rehabilitation of irrigation facilities • Maintenance by Water Users Association • Procurement of construction materials and tools • Financial arrangement |
| Input | <ul style="list-style-type: none"> • Surveyor (Dzongkhag) • Irrigation Engineer for Rehabilitation Plan (Dzongkhag) • Irrigation Engineer for Supervision (Dzongkhag) • Construction Materials (DRDS, MOA) • Skilled Labor (Mason, Carpenter etc.) • Unskilled Labor (WUA) • Project Cost Nu. 0.792 mil. • Maintenance by Water Users Association |
| Output | The existing irrigation facilities are rehabilitated to attain the food crop production increase. (canal length=6.0km, water management improvement) |
| Period (On going) | <ul style="list-style-type: none"> • Survey and Plan 2003.10~2003.12 • Rehabilitation 2002.1~2003.3 • Maintenance 2003.4~ |
| Related Program / Sub-program (How) | <ul style="list-style-type: none"> • Program for Food Crop Production Increase/Food Security SP, Paddy-rice Production SP, Post-harvest Technology Training SP(They will be executed together with Irrigation Development SP) • Extension Strengthening Program/Extension Strengthening for Food Crop SP(Extension will be executed to the beneficiaries of rehabilitated irrigation facilities) |
| Project Justification | <ul style="list-style-type: none"> • Environment: IEE was conducted in the Master Plan. As this is actually rehabilitation of irrigation facilities, it will be enough to assess by only the routine environmental checking by NEC to be executed before the commencement of rehabilitation and an authorization issuance of NEC will be applied by Dzongkhag. • Efficiency: Reasonable range of rehabilitation cost of canal per km is about 132,000 Nu estimated in 9th FYP in the maximum limitation. • Consistency with upper plan/program: This is based on the program of MOA. • Sustainability: The participation of beneficiaries, maintenance fund contribution and so on should be confirmed on the basis of the national irrigation policy procedural manual prepared by MOA. |

III. Implementing Organization

(a) Organization chart (organogram)



(b) General Role and Responsibility of Stakeholders

| Stakeholder | | General Role and Responsibility |
|---------------|---|---|
| National | DRDS, MOA | Responsible for the program comprehensively in terms of finance, technical backstopping and coordination with other stakeholders. |
| Dzongkhag | Engineering Office/ Agriculture Office | Actually supervises WUA from rehabilitation and maintenance by WUA including accounting of the program. |
| Gewog | GYT | Formulate the Gewog rehabilitation plan and evaluate the program in the plan, and based on this, made the official request letter and submit it to Dzongkhag. |
| Beneficiaries | WUA | Directly engages in the program and participate the rehabilitation and maintenance from at the inspection of facilities as unskilled labor free of charge. |

IV. Action Plan (sequent)

| Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|---|-------------------------------|---|
| 1 Consensus in GYT | GYT | The request of irrigation facilities rehabilitation from WUA will be discussed in GYT and with the consensus will be proceeded to Dzongkhag. |
| 2 Official request (IRRIFORM.01) for rehabilitation | GYT | The GYT member will prepare a request letter and the letter with the signature of Gup will be officially submitted to Dzongkhag with necessary information for evaluation (required works, contribution by Gewogs or beneficiaries, etc.) |
| 3 Inspection of facilities to be rehabilitated | Dzongkhag/ WUA | The inspection will be executed to find out whether the proposed request meets the basic requirements for government assistance. The rehabilitation identification report will be made for further procedure referring to Module 1. |
| 4 Consensus in DYT | Dzongkhag / DYT | The request will be discussed based on the rehabilitation identification report, and with the consensus and Dzongda's approval will be proceeded to MOA and MOF for further procedure for budget allocation. |
| 5 Budget allocation for | Dzongkhag | The budget for rehabilitation survey will be arranged in MOF after |

| Required Action (WHAT) | | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|------------------------|---|-------------------------------|--|
| | rehabilitation survey | | scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 6 | Survey and plan for rehabilitation | Dzongkhag | Rehabilitation survey will be executed to determine whether the proposed request is reasonable and necessary or not. The rehabilitation survey report with a detailed rehabilitation plan, countermeasures for the problems and estimation of the rehabilitation cost will be made referring to Module 2. |
| 7 | Budget allocation for rehabilitation | Dzongkhag | The budget for rehabilitation of irrigation facilities will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 8 | Procurement of materials and tools | Dzongkhag | Supplying materials and tools including technical backstopping from Dzongkhag for rehabilitation of irrigation facilities will be arranged based on the requisition of Dzongkhag in implementation. |
| 9 | Overall management of rehabilitation | Dzongkhag | The rehabilitation of irrigation facilities will be carried out under the management of Dzongkhag in implementation. |
| 10 | Arrangement of unskilled labor | WUA | WUA shall provide free unskilled labor in accordance with the arrangement of the site in-charge. |
| 11 | Reserving fund for maintenance works | WUA | For the following maintenance, the fund will be reserved in the system of WUA as same as the proposed irrigation scheme. |
| 12 | Routine maintenance | WUA | Routine maintenance like canal cleaning, weeding will be periodically and timely carried out under the guidance of the site in-charge after rehabilitation. |
| 13 | Periodical maintenance | WUA | Annual maintenance for natural calamity and unexpected disasters will be periodically carried out under the guidance of the site in-charge after rehabilitation. |
| 14 | Periodical repair works | MOA/ WUA | Major repair will be executed using construction machinery to be arranged by CMU/MOA and Dzongkhag every five year after rehabilitation, if necessary. |
| 15 | Establishment period inspection visit | Dzongkhag | Inspection and evaluation of the irrigation system will be executed each year during the establishment period (in five years after the rehabilitation) to monitor and evaluate the condition of the irrigation system, functioning WUA, crop productivity and assess the need for further Dzongkhag support in accordance with Module 8. |
| 16 | Dzongkhag water users' association conference | Dzongkhag | This provides a forum where representatives of different WUAs can present and discuss progress, programs and problems. each year during the establishment period(in five years after the rehabilitation) During the conference measures to overcome certain problems facing the WUAs can be framed jointly by the concerned WUA and the Dzongkhag irrigation sector in accordance with Module 9. |

Note: FORM and Module are procedure regulated for irrigation facilities development by MOA, the irrigation facilities rehabilitation program will follow this procedure as well.

V. Schedule

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|--|--------|------|------|------|------|------|------|------|------|------|------|------|
| 1 | Consensus in GYT | 2003.4 | | □ | | | | | | | | | |
| 2 | Official request (IRRI FORM.01) for rehabilitation | 2003.4 | | □ | | | | | | | | | |
| 3 | Inspection of facilities to be rehabilitated | 2003.5 | | □ | | | | | | | | | |

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|-------------------|------|------|------|------|------|------|------|------|------|------|------|
| 4 | Consensus in DYT | 2003.5 | | □ | | | | | | | | | |
| 5 | Budget allocation for rehabilitation survey | 2003.6 | | □ | | | | | | | | | |
| 6 | Survey and plan estimation for rehabilitation | 2003.7 - 2004.3 | | □ | | | | | | | | | |
| 7 | Budget allocation for rehabilitation | 2004.3 | | | □ | | | | | | | | |
| 8 | Procurement of materials and tools | 2004.4 - 2004.6 | | | □ | | | | | | | | |
| 9 | Overall management of rehabilitation | 2004.7 - 2007.6 | | | □ | | | | | | | | |
| 10 | Arrangement of unskilled labor | 2004.7 - 2007.6 | | | □ | | | | | | | | |
| 11 | Reserving fund for maintenance works | 2007.1 - | | | | | | □ | | | | | |
| 12 | Routine maintenance | 2007.7 - | | | | | | □ | | | | | |
| 13 | Periodical maintenance | 2008.7 - | | | | | | □ | □ | □ | □ | □ | |
| 14 | Periodical repair works | 2012.6 - | | | | | | | | | | | □ |
| 15 | Establishment period inspection visit | 2007.11 - 2011.11 | | | | | | □ | □ | □ | □ | □ | |
| 16 | Dzongkhag water users' association conference | 2008.1 - | | | | | | □ | □ | □ | □ | □ | |

VI. Implementation and Monitoring System

| Action | Plan | |
|---|-------|--|
| Progress Management of A/P | WHO | DE/DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Engineering/Agriculture Office |
| | HOW | Monthly Report prepared by Site Engineer of Dzongkhag |
| Budget Management at Preparatory Stage | WHO | Superintending Engineer, DRDS, MOA |
| | WHEN | Every Financial Year |
| | WHERE | MOA Office, Thimphu |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at Implementation Stage | WHO | DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Agriculture Office |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at O&M Stage | WHO | Chairperson, WUA |
| | WHEN | Monthly basis |
| | WHERE | Accountant, WUA |
| | HOW | Constitution/Bylaws enacted in WUA |
| 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/ Agriculture Office, Dzongkhag at implementation stage/ WUA Office 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 Office discusses with the beneficiaries. Accident, Participation, Dispute: WUA Office discusses among the beneficiaries and third party. Manpower: DRDS, MOA discusses with the organization concerned. |

1.1.7 Magar Scheme (New)

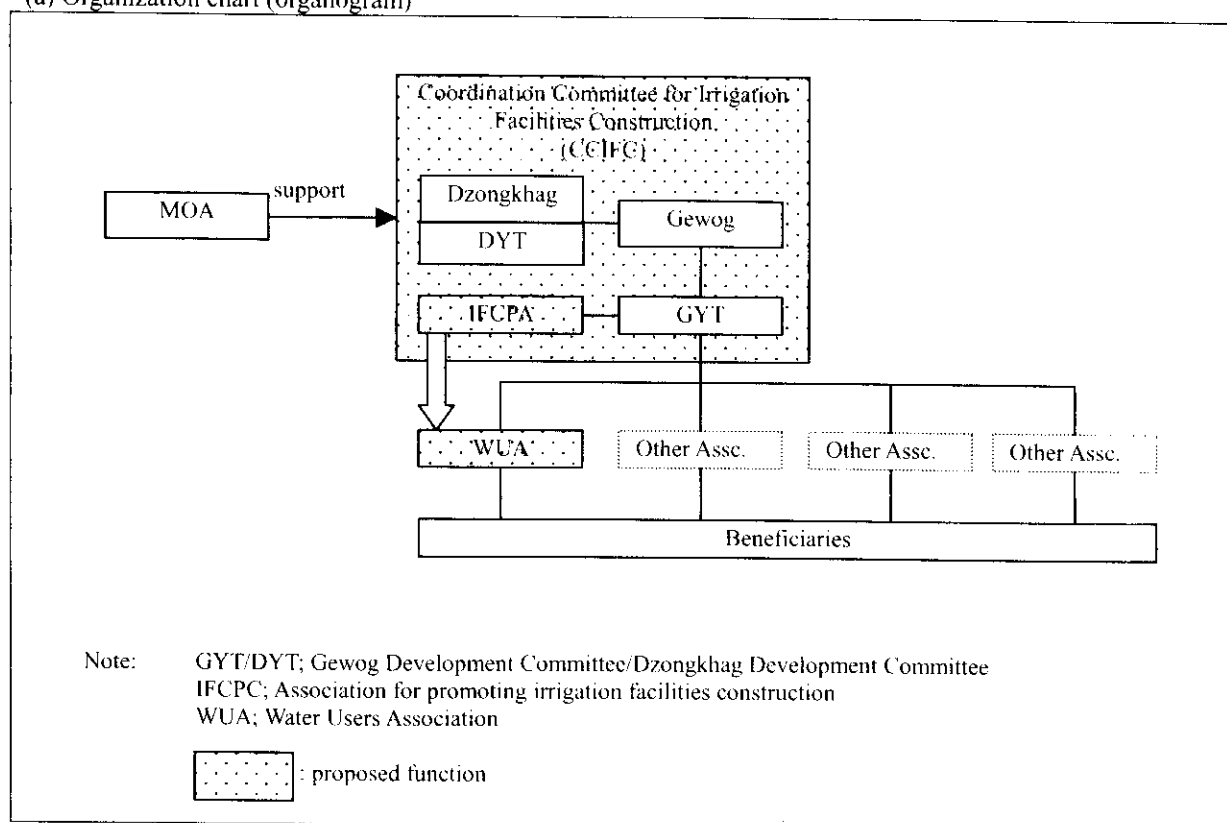
| | | | |
|-------------------|--|---------------------|---|
| I. General | | Sheet No. | AP-7 |
| Program | Program for Food Crop Production Increase / Gangzur / Lhuntse | | |
| Sub-program | Irrigation Development Sub Program (Proposed, Maggar) | | |
| Stakeholders | Level | Organization / Name | Contact Person |
| | National | MOA | Mr. Kaylzang Tshering (SE. DRDS, 02-322228) |
| | Dzongkhag | Lhuntse | Mr. Om Nath Giri (DE, 04-545128) Mr. Deepak Rai (DAO, 04-545127) |
| | Gewog | GYT | Mr. (Gup) |
| | Beneficiaries | Tentative WUA(48HH) | Mr. (DYT Member) |

II. Program/Sub-program

| | |
|-------------------------------------|---|
| Target | To increase food crop production, irrigated area=40.5ha |
| Activities | <ul style="list-style-type: none"> • Survey, Design and Cost estimation • Training for operation and maintenance including bookkeeping • Construction of irrigation facilities • Maintenance by Water Users Association • Procurement of construction materials and tools • Financial arrangement • Establishment of organization |
| Input | <ul style="list-style-type: none"> • Surveyor (Dzongkhag) • Irrigation Engineer for Design (Dzongkhag) • Irrigation Engineer for Supervision (Dzongkhag) • Construction Materials (DRDS, MOA) • Skilled Labor (Mason, Carpenter etc.) • Unskilled Labor (WUA) • Project Cost Nu.1.5 mil. • Maintenance by Water Users Association |
| Output | Irrigation facilities are constructed to attain the food crop production increase (canal length=5.0km, water management improvement) |
| Period(Tentative) | <ul style="list-style-type: none"> • Survey and Design 2003.7-2004.6 • Construction 2004.7-2007.6 • Operation & Maintenance 2007.7- |
| Related Program / Sub-program (How) | <ul style="list-style-type: none"> • Program for Food Crop Production Increase/Food Security SP, Paddy-rice Production SP, Post-harvest Technology Training SP(They will be executed together with Irrigation Development SP) • Extension Strengthening Program/Extension Strengthening for Food Crop SP(Extension will be executed to the beneficiaries of constructed irrigation facilities) |
| Project Justification | <ul style="list-style-type: none"> • Environment: IEE was conducted in the Master Plan. As this is construction of canal by farmers themselves, it will be enough to assess by only the routine environmental checking by NEC to be executed before the commencement of construction and an authorization issuance of NEC will be applied by Dzongkhag. • Efficiency: Reasonable range of construction cost of canal per km is about 300,000 Nu estimated in 9th FYP in the maximum limitation. • Consistency with upper plan/program: This is based on the program of MOA. • Sustainability: The participation of beneficiaries, maintenance fund contribution and so on should be confirmed on the basis of the national irrigation policy procedural manual prepared by MOA |

III. Implementing Organization

(a) Organization chart (organogram)



(b) General Role and Responsibility of Stakeholders

| Stakeholder | | General Role and Responsibility |
|---------------|---|---|
| National | DRDS, MOA | Responsible for the program comprehensively in terms of finance, technical backstopping and coordination with other stakeholders. |
| Dzungkhag | Engineering Office/ Agriculture Office | Actually supervises WUA from its establishment to the construction and maintenance by WUA including accounting of the program. |
| Gewog | GYT | Formulate the Gewog development plan and evaluate the program in the plan, and based on this, made the official request letter and submit it to Dzungkhag. |
| Beneficiaries | WUA | Directly engages in the program and participate the construction and maintenance from at the stage of preliminary survey as unskilled labor free of charge. |

IV. Action Plan (sequent)

| | Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|---|---|-------------------------------|---|
| 1 | Establishment of institution for irrigation facilities construction | Gewog/GYT | An association for promoting irrigation facilities construction (IFCPA) will be tentatively established based on the petition from EA and beneficiaries under Gup in GYT. |
| 2 | Consensus in GYT | GYT | The request of irrigation facilities construction from IFCPA will be discussed in GYT and with the consensus will be proceeded to Dzungkhag. |
| 3 | Official request (IRRIFORM.01) for implementation | GYT | The GYT member will prepare a request letter and the letter with the signature of Gup will be officially submitted to Dzungkhag with necessary information for evaluation (source of water, route, length, contribution by Gewogs or beneficiaries, etc.) |
| 4 | Preliminary Investigations (Module 1) | Dzungkhag / IRCPA | The preliminary Investigations will be executed to find out whether the proposed request meets the basic requirements for government assistance. Project identification report (IRRIFORM.02) will be made for further procedure. |
| 5 | Consensus in DYT | Dzungkhag / DYT | The request will be discussed based on the project identification report and with the consensus and Dzungda's approval will be |

| | Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|----|---|-------------------------------------|---|
| | | | proceeded to MOA and MOF for further procedure for budget allocation. |
| 6 | Budget allocation for Multi-disciplinary Feasibility Study (Module 2) | Dzongkhag | The budget for Multi-disciplinary Feasibility Study will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 7 | Multi-disciplinary Feasibility Study (Module 2) | Dzongkhag | Multi-disciplinary Feasibility Study will be executed to determine whether the proposed request is viable or not and how it can be implemented. Therefore not only engineering survey but also interview survey for agriculture and social aspects have to be done with Gup, GYT member and water users. The feasibility study report (IRRIFORM.03) with a detailed implementation plan, tentative designs and estimation of the project cost will be made. |
| 8 | Environmental study | Dzongkhag / NEC | Based on the feasibility study report, if environmental study is required, EIA will be executed. |
| 9 | Budget allocation for construction | Dzongkhag | The budget for construction of irrigation facilities will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 10 | Pre-construction Meeting 1 (Module 3) | Dzongkhag | Explanation of the need of group/cooperative for construction and maintenance of irrigation facilities and Water Users Association Committee (WUA Committee named in Module 3) to IFCPA will be executed. Formation of Water Uses Association (IRRIFORM.04) and Letter of Undertaking (IRRIFORM.05) will be prepared and reviewed. |
| 11 | Pre-construction Meeting 2 (Module 4) | WUA/ GYT | Water Users Association (WUA) is established and committee members (IRRIFORM.04) will be selected from WUA. Signing of agreements on labor contribution for construction, maintenance fund contribution and compensation of water guard in the letter of understanding (IRRIFORM.05) will be executed between WUA and the representative of Dzongkhag in the meeting. |
| 12 | Land acquisition | WUA | Land acquisition and expropriation along the canal will be carried out under the instruction of Dzongkhag. |
| 13 | Procurement of materials and tools | Dzongkhag | Supplying materials and tools including technical backstopping from Dzongkhag for construction of irrigation facilities will be arranged based on the requisition of Dzongkhag in Implementation. |
| 14 | Overall management of construction | Dzongkhag | The construction of irrigation facilities will be carried out under the management of Dzongkhag in Implementation. |
| 15 | Arrangement of unskilled labor | WUA | WUA shall provide free unskilled labor in accordance with the arrangement of the site in-charge. |
| 16 | Development of WUA constitution and bylaws (Module 5) | WUA | Water users improve the organization and management of their irrigation system through establishing suitable constitution and bylaws. WUA Constitution and Bylaws (IRRIFORM.06) will be made. |
| 17 | Banking and bookkeeping training (Module 6) | Dzongkhag | Irrigation staff of Dzongkhag should support WUA to open a bank account for the maintenance fund and train them how to operate it. |
| 18 | Scheme management training (Module 7) | Dzongkhag | The training is held for the water users to know the types of support that the RGOB can give to the WUA for operation and maintenance. Project Completion Report (IRRIFORM.07) and Certificate of Satisfactory Completion (IRRIFORM.08) will be prepared. |
| 19 | Completion and Handing over | Dzongkhag/ WUA | The irrigation facilities shall be handed over to WUA after signing the Project Completion Report (IRRIFORM.07) and the Certificate of Satisfactory Completion (IRRIFORM.08). |
| 20 | Reserving fund for maintenance works | WUA | For the following maintenance, the fund will be reserved in the system of WUA. |

| Required Action (WHAT) | | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|------------------------|--|-------------------------------|--|
| 21 | Routine maintenance | WUA | Routine maintenance like canal cleaning, weeding will be periodically and timely carried out under the guidance of the site in-charge. |
| 22 | Periodical maintenance | WUA | Annual maintenance for natural calamity and unexpected disasters will be periodically carried out under the guidance of the site in-charge. |
| 23 | Periodical repair works | MOA/ WUA | Major repair will be executed using construction machinery to be arranged by CMU/MOA and Dzongkhag every five year, if necessary. |
| 24 | Establishment period inspection visit (Module 8) | Dzongkhag | Inspection and evaluation of the irrigation system will be executed to monitor and evaluate the condition of the irrigation system, functioning WUA, crop productivity and assess the need for further Dzongkhag support in every 5 years. |
| 25 | Dzongkhag water users' association conference (Module 9) | Dzongkhag | This provides a forum where representatives of different WUAs can present and discuss progress, programs and problems. During the conference measures to overcome certain problems facing the WUAs can be framed jointly by the concerned WUA and the Dzongkhag irrigation sector. |

Note: FORM and Module are procedure regulated for irrigation facilities development by MOA.

V. Schedule

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|-----------------|------|------|------|------|------|------|------|------|------|------|------|
| 1 | Establishment of institution for irrigation facilities construction | 2003.4 | | □ | | | | | | | | | |
| 2 | Consensus in GYT | 2003.4 | | □ | | | | | | | | | |
| 3 | Official request (IRRIFORM.01) for implementation | 2003.4 | | □ | | | | | | | | | |
| 4 | Preliminary Investigations (Module 1) | 2003.5 | | □ | | | | | | | | | |
| 5 | Consensus in DYT | 2003.5 | | □ | | | | | | | | | |
| 6 | Budget allocation for Multi-disciplinary Feasibility Study (Module 2) | 2003.6 | | □ | | | | | | | | | |
| 7 | Multi-disciplinary Feasibility Study (Module 2) | 2003.7 - 2004.5 | | | □ | | | | | | | | |
| 8 | Environmental study | 2004.5 | | | □ | | | | | | | | |
| 9 | Budget allocation for construction | 2004.5 | | | □ | | | | | | | | |
| 10 | Pre-construction Meeting 1 (Module 3) | 2004.6 | | | □ | | | | | | | | |
| 11 | Pre-construction Meeting 2 (Module 4) | 2004.6 | | | □ | | | | | | | | |

| Required Action (WHAT) | | Period | 20 02 | 20 03 | 20 04 | 20 05 | 20 06 | 20 07 | 20 08 | 20 09 | 20 10 | 20 11 | 20 12 |
|---------------------------|--|--------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 12 | Land acquisition | 2004.4 - 2007.6 | | | [] | | | | | | | | |
| 13 | Procurement of materials and tools | 2004.4 - 2004.6 | | [] | | | | | | | | | |
| 14 | Overall management of <i>construction</i> | 2004.7 - 2007.6 | | | [] | | | | | | | | |
| 15 | Arrangement of unskilled labor | 2004.7 - 2007.6 | | | [] | | | | | | | | |
| 16 | Development of WUA constitution and bylaws (Module 5) | 2004.7 | | [] | | | | | | | | | |
| 17 | Banking and bookkeeping training (Module 6) | 2004.7 | | [] | | | | | | | | | |
| 18 | Scheme management training (Module 7) | 2007.6 | | | | | | [] | | | | | |
| 19 | Completion and Handing over | 2007.6 | | | | | | [] | | | | | |
| 20 | Reserving fund for maintenance works | 2007.1 - | | | | | | | [] | | | | |
| 21 | Routine maintenance | 2007.7 - | | | | | | | [] | | | | |
| 22 | Periodical maintenance | 2008.7 - | | | | | | | [] | [] | [] | [] | [] |
| 23 | Periodical repair works | 2012.6 - | | | | | | | | | | | [] |
| 24 | Establishment period inspection visit (Module 8) | 2007.11 - | | | | | | [] | [] | [] | [] | [] | |
| 25 | Dzongkhag water users' association conference (Module 9) | 2008.1 - | | | | | | [] | [] | [] | [] | [] | |

VI. Implementation and Monitoring System

| Action | Plan | |
|---|-------|--|
| Progress Management of A/P | WHO | DE/DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Engineering/Agriculture Office |
| | HOW | Monthly Report prepared by Site Engineer of Dzongkhag |
| Budget Management at Preparatory Stage | WHO | Superintending Engineer, DRDS, MOA |
| | WHEN | Every Financial Year |
| | WHERE | MOA Office, Thimphu |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at Implementation Stage | WHO | DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Agriculture Office |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at O&M Stage | WHO | Chairperson, WUA |
| | WHEN | Monthly basis |
| | WHERE | Accountant, WUA |
| | HOW | Constitution/Bylaws enacted in WUA |
| 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/ Agriculture Office, Dzongkhag at implementation stage/ WUA Office 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 Office discusses with the beneficiaries. Accident, Participation, Dispute: WUA Office discusses among the beneficiaries and third party. Manpower: DRDS, MOA discusses with the organization concerned. |

1.1.8 Ney (Dungkhag) Scheme (New)

I. General

Sheet No.

AP-8

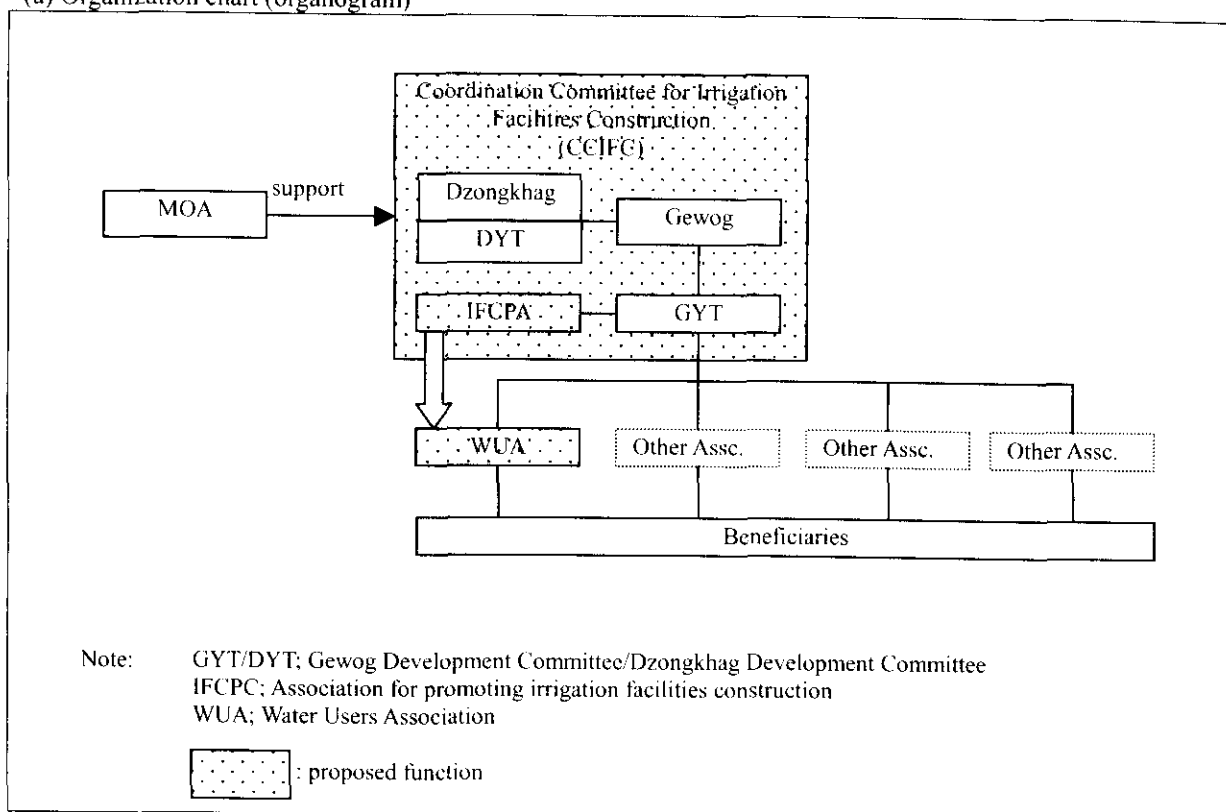
| | | | |
|--------------|--|---------------------|---|
| Program | Program for Food Crop Production Increase / Gangzur / Lhuntse | | |
| Sub-program | Irrigation Development Sub Program (Proposed, Ney (Dangkhartang)) | | |
| Stakeholders | Level | Organization / Name | Contact Person |
| | National | MOA | Mr.Kaylzang Tshering (SE. DRDS, 02-322228) |
| | Dzongkhag | Lhuntse | Mr.Om Nath Giri (DE, 04-545128) Mr.Deepak Rai (DAO, 04-545127) |
| | Gewog | GYT | Mr. (Gup) |
| | Beneficiaries | Tentative WUA(60HH) | Mr. (DYT Member) |

II. Program/Sub-program

| | |
|-------------------------------------|---|
| Target | To increase food crop production, irrigated area=20.2ha |
| Activities | <ul style="list-style-type: none"> • Survey, Design and Cost estimation • Training for operation and maintenance including bookkeeping • Construction of irrigation facilities • Maintenance by Water Users Association • Procurement of construction materials and tools • Financial arrangement • Establishment of organization |
| Input | <ul style="list-style-type: none"> • Surveyor (Dzongkhag) • Irrigation Engineer for Design (Dzongkhag) • Irrigation Engineer for Supervision (Dzongkhag) • Construction Materials (DRDS, MOA) • Skilled Labor (Mason, Carpenter etc.) • Unskilled Labor (WUA) • Project Cost Nu.1.5 mil. • Maintenance by Water Users Association |
| Output | Irrigation facilities are constructed to attain the food crop production increase. (canal length=5.0km, water management improvement) |
| Period(Tentative) | <ul style="list-style-type: none"> • Survey and Design 2003.7~2004.6 • Construction 2004.7~2007.6 • Operation & Maintenance 2007.7~ |
| Related Program / Sub-program (How) | <ul style="list-style-type: none"> • Program for Food Crop Production Increase/Food Security SP, Paddy-rice Production SP, Post-harvest Technology Training SP(They will be executed together with Irrigation Development SP) • Extension Strengthening Program/Extension Strengthening for Food Crop SP(Extension will be executed to the beneficiaries of constructed irrigation facilities) |
| Project Justification | <ul style="list-style-type: none"> • Environment: IEE was conducted in the Master Plan. As this is construction of canal by farmers themselves, it will be enough to assess by only the routine environmental checking by NEC to be executed before the commencement of construction and an authorization issuance of NEC will be applied by Dzongkhag. • Efficiency: Reasonable range of construction cost of canal per km is about 300,000 Nu estimated in 9th FYP in the maximum limitation. • Consistency with upper plan/program: This is based on the program of MOA. • Sustainability: The participation of beneficiaries, maintenance fund contribution and so on should be confirmed on the basis of the national irrigation policy procedural manual prepared by MOA |

III. Implementing Organization

(a) Organization chart (organogram)



(b) General Role and Responsibility of Stakeholders

| Stakeholder | | General Role and Responsibility |
|---------------|---|---|
| National | DRDS, MOA | Responsible for the program comprehensively in terms of finance, technical backstopping and coordination with other stakeholders. |
| Dzongkhag | Engineering Office/ Agriculture Office | Actually supervises WUA from its establishment to the construction and maintenance by WUA including accounting of the program. |
| Gewog | GYT | Formulate the Gewog development plan and evaluate the program in the plan, and based on this, made the official request letter and submit it to Dzongkhag. |
| Beneficiaries | WUA | Directly engages in the program and participate the construction and maintenance from at the stage of preliminary survey as unskilled labor free of charge. |

IV. Action Plan (sequent)

| | Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|---|---|-------------------------------|---|
| 1 | Establishment of institution for irrigation facilities construction | Gewog/GYT | An association for promoting irrigation facilities construction (IFCPA) will be tentatively established based on the petition from EA and beneficiaries under Gup in GYT. |
| 2 | Consensus in GYT | GYT | The request of irrigation facilities construction from IFCPA will be discussed in GYT, and with the consensus will be proceeded to Dzongkhag. |
| 3 | Official request (IRRIFORM.01) for implementation | GYT | The GYT member will prepare a request letter and the letter with the signature of Gup will be officially submitted to Dzongkhag with necessary information for evaluation (source of water, route, length, contribution by Gewogs or beneficiaries, etc.) |
| 4 | Preliminary Investigations (Module 1) | Dzongkhag / IFCPA | The preliminary investigations will be executed to find out whether the proposed request meets the basic requirements for government assistance. Project identification report (IRRIFORM.02) will be made for further procedure. |
| 5 | Consensus in DYT | Dzongkhag / DYT | The request will be discussed based on the project identification report, and with the consensus and Dzongda's approval will be |

| | Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|----|---|-------------------------------|---|
| | | | proceeded to MOA and MOF for further procedure for budget allocation. |
| 6 | Budget allocation for Multi-disciplinary Feasibility Study (Module 2) | Dzongkhag | The budget for Multi-disciplinary Feasibility Study will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 7 | Multi-disciplinary Feasibility Study (Module 2) | Dzongkhag | Multi-disciplinary Feasibility Study will be executed to determine whether the proposed request is viable or not and how it can be implemented. Therefore not only engineering survey but also interview survey for agriculture and social aspects have to be done with Gup, GYT member and water users. The feasibility study report (IRRIFORM.03) with a detailed implementation plan, tentative designs and estimation of the project cost will be made. |
| 8 | Environmental study | Dzongkhag / NEC | Based on the feasibility study report, if environmental study is required, EIA will be executed. |
| 9 | Budget allocation for construction | Dzongkhag | The budget for construction of irrigation facilities will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 10 | Pre-construction Meeting 1 (Module 3) | Dzongkhag | Explanation of the need of group/cooperative for construction and maintenance of irrigation facilities and Water Users Association Committee (WUACommittee named in Module 3) to IFCPA will be executed. Formation of Water Uses Association (IRRIFORM.04) and Letter of Undertaking (IRRIFORM.05) will be prepared and reviewed. |
| 11 | Pre-construction Meeting 2 (Module 4) | WUA/ GYT | Water Users Association (WUA) is established and committee members (IRRIFORM.04) will be selected from WUA. Signing of agreements on labor contribution for construction, maintenance fund contribution and compensation of water guard in the letter of understanding (IRRIFORM.05) will be executed between WUA and the representative of Dzongkhag in the meeting. |
| 12 | Land acquisition | WUA | Land acquisition and expropriation along the canal will be carried out under the instruction of Dzongkhag. |
| 13 | Procurement of materials and tools | Dzongkhag | Supplying materials and tools including technical backstopping from Dzongkhag for construction of irrigation facilities will be arranged based on the requisition of Dzongkhag in Implementation. |
| 14 | Overall management of construction | Dzongkhag | The construction of irrigation facilities will be carried out under the management of Dzongkhag in Implementation. |
| 15 | Arrangement of unskilled labor | WUA | WUA shall provide free unskilled labor in accordance with the arrangement of the site in-charge. |
| 16 | Development of WUA constitution and bylaws (Module 5) | WUA | Water users improve the organization and management of their irrigation system through establishing suitable constitution and bylaws. WUA Constitution and Bylaws (IRRIFORM.06) will be made. |
| 17 | Banking and bookkeeping training (Module 6) | Dzongkhag | Irrigation staff of Dzongkhag should support WUA to open a bank account for the maintenance fund and train them how to operate it. |
| 18 | Scheme management training (Module 7) | Dzongkhag | The training is held for the water users to know the types of support that the RGOB can give to the WUA for operation and maintenance. Project Completion Report (IRRIFORM.07) and Certificate of Satisfactory Completion (IRRIFORM.08) will be prepared. |
| 19 | Completion and Handing over | Dzongkhag/ WUA | The irrigation facilities shall be handed over to WUA after signing the Project Completion Report (IRRIFORM.07) and the Certificate of Satisfactory Completion (IRRIFORM.08). |
| 20 | Reserving fund for maintenance works | WUA | For the following maintenance, the fund will be reserved in the system of WUA. |

| Required Action (WHAT) | | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|------------------------|--|-------------------------------|--|
| 21 | Routine maintenance | WUA | Routine maintenance like canal cleaning, weeding will be periodically and timely carried out under the guidance of the site in-charge. |
| 22 | Periodical maintenance | WUA | Annual maintenance for natural calamity and unexpected disasters will be periodically carried out under the guidance of the site in-charge. |
| 23 | Periodical repair works | MOA/ WUA | Major repair will be executed using construction machinery to be arranged by CMU/MOA and Dzongkhag every five year, if necessary. |
| 24 | Establishment period inspection visit (Module 8) | Dzongkhag | Inspection and evaluation of the irrigation system will be executed to monitor and evaluate the condition of the irrigation system, functioning WUA, crop productivity and assess the need for further Dzongkhag support in every 5 years. |
| 25 | Dzongkhag water users' association conference (Module 9) | Dzongkhag | This provides a forum where representatives of different WUAs can present and discuss progress, programs and problems. During the conference measures to overcome certain problems facing the WUAs can be framed jointly by the concerned WUA and the Dzongkhag irrigation sector. |

Note: FORM and Module are procedure regulated for irrigation facilities development by MOA.

V. Schedule

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|-----------------|------|------|------|------|------|------|------|------|------|------|------|
| 1 | Establishment of institution for irrigation facilities construction | 2003.4 | | □ | | | | | | | | | |
| 2 | Consensus in GYT | 2003.4 | | □ | | | | | | | | | |
| 3 | Official request (IRRIFORM.01) for implementation | 2003.4 | | □ | | | | | | | | | |
| 4 | Preliminary Investigations (Module 1) | 2003.5 | | □ | | | | | | | | | |
| 5 | Consensus in DYT | 2003.5 | | □ | | | | | | | | | |
| 6 | Budget allocation for Multi-disciplinary Feasibility Study (Module 2) | 2003.6 | | □ | | | | | | | | | |
| 7 | Multi-disciplinary Feasibility Study (Module 2) | 2003.7 - 2004.5 | | | □ | | | | | | | | |
| 8 | Environmental study | 2004.5 | | | □ | | | | | | | | |
| 9 | Budget allocation for construction | 2004.5 | | | □ | | | | | | | | |
| 10 | Pre-construction Meeting 1 (Module 3) | 2004.6 | | | □ | | | | | | | | |
| 11 | Pre-construction Meeting 2 (Module 4) | 2004.6 | | | □ | | | | | | | | |

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|--|-----------------|------|------|------|------|------|------|------|------|------|------|------|
| 12 | Land acquisition | 2004.4 - 2007.6 | | | | | | | | | | | |
| 13 | Procurement of materials and tools | 2004.4 - 2004.6 | | | | | | | | | | | |
| 14 | Overall management of construction | 2004.7 - 2007.6 | | | | | | | | | | | |
| 15 | Arrangement of unskilled labor | 2004.7 - 2007.6 | | | | | | | | | | | |
| 16 | Development of WUA constitution and bylaws (Module 5) | 2004.7 | | | | | | | | | | | |
| 17 | Banking and bookkeeping training (Module 6) | 2004.7 | | | | | | | | | | | |
| 18 | Scheme management training (Module 7) | 2007.6 | | | | | | | | | | | |
| 19 | Completion and Handing over | 2007.6 | | | | | | | | | | | |
| 20 | Reserving fund for maintenance works | 2007.1 - | | | | | | | | | | | |
| 21 | Routine maintenance | 2007.7 - | | | | | | | | | | | |
| 22 | Periodical maintenance | 2008.7 - | | | | | | | | | | | |
| 23 | Periodical repair works | 2012.6 - | | | | | | | | | | | |
| 24 | Establishment period inspection visit (Module 8) | 2007.11 - | | | | | | | | | | | |
| 25 | Dzongkhag water users' association conference (Module 9) | 2008.1 - | | | | | | | | | | | |

VI. Implementation and Monitoring System

| Action | Plan | |
|---|-------|---|
| Progress Management of A/P | WHO | DE/DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Engineering/Agriculture Office |
| | HOW | Monthly Report prepared by Site Engineer of Dzongkhag |
| Budget Management at Preparatory Stage | WHO | Superintending Engineer, DRDS, MOA |
| | WHEN | Every Financial Year |
| | WHERE | MOA Office, Thimphu |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at Implementation Stage | WHO | DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Agriculture Office |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at O&M Stage | WHO | Chairperson, WUA |
| | WHEN | Monthly basis |
| | WHERE | Accountant, WUA |

| | | |
|-----------------|-------|--|
| | HOW | Constitution/Bylaws enacted in WUA |
| 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/ Agriculture Office, Dzongkhag at implementation stage/ WUA Office 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 Office discusses with the beneficiaries. Accident, Participation, Dispute: WUA Office discusses among the beneficiaries and third party. Manpower: DRDS, MOA discusses with the organization concerned. |

1.1.9 Shawa (New)

I. General

Sheet No.

AP-9

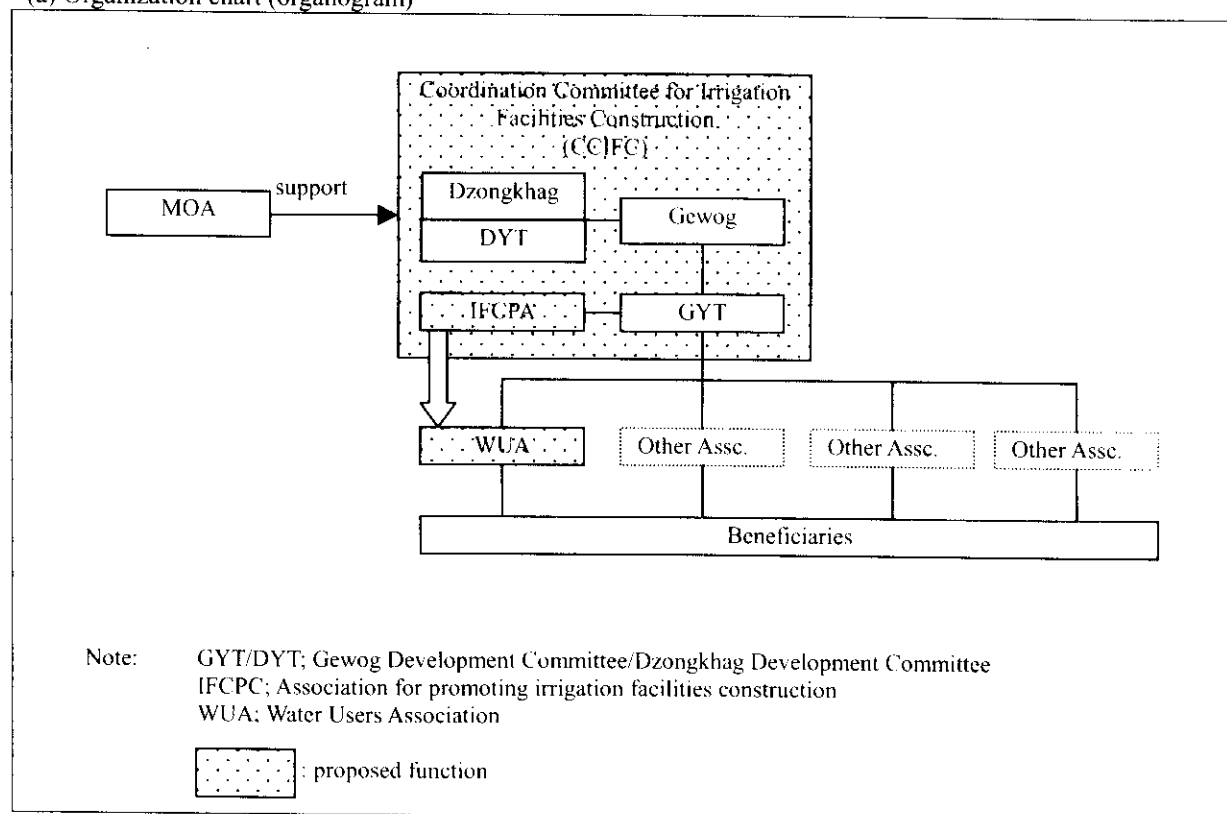
| | | | |
|--------------|--|---------------------|---|
| Program | Program for Food Crop Production Increase / Gangzur / Lhuntse | | |
| Sub-program | Irrigation Development Sub Program (Proposed, Shawa) | | |
| Stakeholders | Level | Organization / Name | Contact Person |
| | National | MOA | Mr. Kayljang Tshering (SE. DRDS, 02-322228) |
| | Dzongkhag | Lhuntse | Mr. Om Nath Giri (DE, 04-545128) Mr. Deepak Rai (DAO, 04-545127) |
| | Gewog | GYT | Mr. (Gup) |
| | Beneficiaries | Tentative WUA(30HH) | Mr. (DYT Member) |

II. Program/Sub-program

| | |
|-------------------------------------|---|
| Target | To increase food crop production, irrigated area=4.0ha |
| Activities | <ul style="list-style-type: none"> • Survey, Design and Cost estimation • Training for operation and maintenance including bookkeeping • Construction of irrigation facilities • Maintenance by Water Users Association • Procurement of construction materials and tools • Financial arrangement • Establishment of organization |
| Input | <ul style="list-style-type: none"> • Surveyor (Dzongkhag) • Irrigation Engineer for Design (Dzongkhag) • Irrigation Engineer for Supervision (Dzongkhag) • Construction Materials (DRDS, MOA) • Skilled Labor (Mason, Carpenter etc.) • Unskilled Labor (WUA) • Project Cost Nu. 0.9 mil. • Maintenance by Water Users Association |
| Output | Irrigation facilities are constructed to attain the food crop production increase. (canal length=3.0km, water management improvement) |
| Period(Tentative) | <ul style="list-style-type: none"> • Survey and Design 2002.7~2003.6 • Construction 2003.7~2006.6 • Operation & Maintenance 2006.7~ |
| Related Program / Sub-program (How) | <ul style="list-style-type: none"> • Program for Food Crop Production Increase/Food Security SP, Paddy-rice Production SP, Post-harvest Technology Training SP(They will be executed together with Irrigation Development SP) • Extension Strengthening Program/Extension Strengthening for Food Crop SP(Extension will be executed to the beneficiaries of constructed irrigation facilities) |
| Project Justification | <ul style="list-style-type: none"> • Environment: IEE was conducted in the Master Plan. As this is construction of canal by farmers themselves, it will be enough to assess by only the routine environmental checking by NEC to be executed before the commencement of construction and an authorization issuance of NEC will be applied by Dzongkhag. • Efficiency: Reasonable range of construction cost of canal per km is about 300,000 Nu estimated in 9th FYP in the maximum limitation. • Consistency with upper plan/program: This is based on the program of MOA. • Sustainability: The participation of beneficiaries, maintenance fund contribution and so on should be confirmed on the basis of the national irrigation policy procedural manual prepared by MOA |

III. Implementing Organization

(a) Organization chart (organogram)



(b) General Role and Responsibility of Stakeholders

| Stakeholder | | General Role and Responsibility |
|---------------|---|---|
| National | DRDS, MOA | Responsible for the program comprehensively in terms of finance, technical backstopping and coordination with other stakeholders. |
| Dzongkhag | Engineering Office/ Agriculture Office | Actually supervises WUA from its establishment to the construction and maintenance by WUA including accounting of the program. |
| Gewog | GYT | Formulate the Gewog development plan and evaluate the program in the plan, and based on this, made the official request letter and submit it to Dzongkhag. |
| Beneficiaries | WUA | Directly engages in the program and participate the construction and maintenance from at the stage of preliminary survey as unskilled labor free of charge. |

IV. Action Plan (sequent)

| Required Action (WHAT) | | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|------------------------|---|-------------------------------|---|
| 1 | Establishment of institution for irrigation facilities construction | Gewog/GYT | An association for promoting irrigation facilities construction (IFCPA) will be tentatively established based on the petition from EA and beneficiaries under Gup in GYT. |
| 2 | Consensus in GYT | GYT | The request of irrigation facilities construction from IFCPA will be discussed in GYT, and with the consensus will be proceeded to Dzongkhag. |
| 3 | Official request (IRRIFORM.01) for implementation | GYT | The GYT member will prepare a request letter and the letter with the signature of Gup will be officially submitted to Dzongkhag with necessary information for evaluation (source of water, route, length, contribution by Gewogs or beneficiaries, etc.) |
| 4 | Preliminary Investigations (Module 1) | Dzongkhag / IRCPA | The preliminary Investigations will be executed to find out whether the proposed request meets the basic requirements for government assistance. Project identification report (IRRIFORM.02) will be made for further procedure. |
| 5 | Consensus in DYT | Dzongkhag / DYT | The request will be discussed based on the project identification report, and with the consensus and Dzongkhag's approval will be |

| | Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|----|---|-------------------------------|---|
| | | | proceeded to MOA and MOF for further procedure for budget allocation. |
| 6 | Budget allocation for Multi-disciplinary Feasibility Study (Module 2) | Dzongkhag | The budget for Multi-disciplinary Feasibility Study will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 7 | Multi-disciplinary Feasibility Study (Module 2) | Dzongkhag | Multi-disciplinary Feasibility Study will be executed to determine whether the proposed request is viable or not and how it can be implemented. Therefore not only engineering survey but also interview survey for agriculture and social aspects have to be done with Gup, GYT member and water users. The feasibility study report (IRRIFORM.03) with a detailed implementation plan, tentative designs and estimation of the project cost will be made. |
| 8 | Environmental study | Dzongkhag / NEC | Based on the feasibility study report, if environmental study is required, EIA will be executed. |
| 9 | Budget allocation for construction | Dzongkhag | The budget for construction of irrigation facilities will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 10 | Pre-construction Meeting 1 (Module 3) | Dzongkhag | Explanation of the need of group/cooperative for construction and maintenance of irrigation facilities and Water Users Association Committee (WUACommittee named in Module 3) to IFCPA will be executed. Formation of Water Uses Association (IRRIFORM.04) and Letter of Undertaking (IRRIFORM.05) will be prepared and reviewed. |
| 11 | Pre-construction Meeting 2 (Module 4) | WUA/ GYT | Water Users Association (WUA) is established and committee members (IRRIFORM.04) will be selected from WUA. Signing of agreements on labor contribution for construction, maintenance fund contribution and compensation of water guard in the letter of understanding (IRRIFORM.05) will be executed between WUA and the representative of Dzongkhag in the meeting. |
| 12 | Land acquisition | WUA | Land acquisition and expropriation along the canal will be carried out under the instruction of Dzongkhag. |
| 13 | Procurement of materials and tools | Dzongkhag | Supplying materials and tools including technical backstopping from Dzongkhag for construction of irrigation facilities will be arranged based on the requisition of Dzongkhag in Implementation. |
| 14 | Overall management of construction | Dzongkhag | The construction of irrigation facilities will be carried out under the management of Dzongkhag in Implementation. |
| 15 | Arrangement of unskilled labor | WUA | WUA shall provide free unskilled labor in accordance with the arrangement of the site in-charge. |
| 16 | Development of WUA constitution and bylaws (Module 5) | WUA | Water users improve the organization and management of their irrigation system through establishing suitable constitution and bylaws. WUA Constitution and Bylaws (IRRIFORM.06) will be made. |
| 17 | Banking and bookkeeping training (Module 6) | Dzongkhag | Irrigation staff of Dzongkhag should support WUA to open a bank account for the maintenance fund and train them how to operate it. |
| 18 | Scheme management training (Module 7) | Dzongkhag | The training is held for the water users to know the types of support that the RGOB can give to the WUA for operation and maintenance. Project Completion Report (IRRIFORM.07)and Certificate of Satisfactory Completion (IRRIFORM.08) will be prepared. |
| 19 | Completion and Handing over | Dzongkhag/ WUA | The irrigation facilities shall be handed over to WUA after signing the Project Completion Report (IRRIFORM.07) and the Certificate of Satisfactory Completion (IRRIFORM.08). |
| 20 | Reserving fund for maintenance works | WUA | For the following maintenance, the fund will be reserved in the system of WUA. |

| Required Action (WHAT) | | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|------------------------|--|-------------------------------|--|
| 21 | Routine maintenance | WUA | Routine maintenance like canal cleaning, weeding will be periodically and timely carried out under the guidance of the site in-charge. |
| 22 | Periodical maintenance | WUA | Annual maintenance for natural calamity and unexpected disasters will be periodically carried out under the guidance of the site in-charge. |
| 23 | Periodical repair works | MOA/ WUA | Major repair will be executed using construction machinery to be arranged by CMU/MOA and Dzongkhag every five year, if necessary. |
| 24 | Establishment period inspection visit (Module 8) | Dzongkhag | Inspection and evaluation of the irrigation system will be executed to monitor and evaluate the condition of the irrigation system, functioning WUA, crop productivity and assess the need for further Dzongkhag support in every 5 years. |
| 25 | Dzongkhag water users' association conference (Module 9) | Dzongkhag | This provides a forum where representatives of different WUAs can present and discuss progress, programs and problems. During the conference measures to overcome certain problems facing the WUAs can be framed jointly by the concerned WUA and the Dzongkhag irrigation sector. |

Note: FORM and Module are procedure regulated for irrigation facilities development by MOA.

V. Schedule

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|-----------------|------|------|------|------|------|------|------|------|------|------|------|
| 1 | Establishment of institution for irrigation facilities construction | 2003.1 | | ☐ | | | | | | | | | |
| 2 | Consensus in GYT | 2003.1 | | ☐ | | | | | | | | | |
| 3 | Official request (IRRIFORM.01) for implementation | 2003.1 | | ☐ | | | | | | | | | |
| 4 | Preliminary Investigations (Module 1) | 2003.2 | | ☐ | | | | | | | | | |
| 5 | Consensus in DYT | 2003.2 | | ☐ | | | | | | | | | |
| 6 | Budget allocation for Multi-disciplinary Feasibility Study (Module 2) | 2003.3 | | ☐ | | | | | | | | | |
| 7 | Multi-disciplinary Feasibility Study (Module 2) | 2003.3 - 2003.5 | | ☐ | | | | | | | | | |
| 8 | Environmental study | 2003.5 | | ☐ | | | | | | | | | |
| 9 | Budget allocation for construction | 2003.5 | | ☐ | | | | | | | | | |
| 10 | Pre-construction Meeting 1 (Module 3) | 2003.5 | | ☐ | | | | | | | | | |
| 11 | Pre-construction Meeting 2 (Module 4) | 2003.5 | | ☐ | | | | | | | | | |

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|--|-----------------|------|------|------|------|------|------|------|------|------|------|------|
| 12 | Land acquisition | 2003.5 - 2006.6 | | [] | | | | | | | | | |
| 13 | Procurement of materials and tools | 2003.5 - 2003.6 | | [] | | | | | | | | | |
| 14 | Overall management of construction | 2003.7 - 2006.6 | | [] | | | | | | | | | |
| 15 | Arrangement of unskilled labor | 2003.7 - 2006.6 | | [] | | | | | | | | | |
| 16 | Development of WUA constitution and bylaws (Module 5) | 2003.7 | | [] | | | | | | | | | |
| 17 | Banking and bookkeeping training (Module 6) | 2003.7 | | [] | | | | | | | | | |
| 18 | Scheme management training (Module 7) | 2006.6 | | | | | | [] | | | | | |
| 19 | Completion and Handing over | 2006.6 | | | | | | [] | | | | | |
| 20 | Reserving fund for maintenance works | 2006.1 - | | | | | | [] | | | | | |
| 21 | Routine maintenance | 2006.7 - | | | | | | [] | | | | | |
| 22 | Periodical maintenance | 2007.7 - | | | | | | [] | [] | [] | [] | [] | [] |
| 23 | Periodical repair works | 2011.6 - | | | | | | | | | | [] | |
| 24 | Establishment period inspection visit (Module 8) | 2006.11 - | | | | | [] | [] | [] | [] | [] | | |
| 25 | Dzongkhag water users' association conference (Module 9) | 2007.1 - | | | | | [] | [] | [] | [] | [] | [] | |

VI. Implementation and Monitoring System

| Action | Plan | |
|---|-------|--|
| Progress Management of A/P | WHO | DE/DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Engineering/Agriculture Office |
| | HOW | Monthly Report prepared by Site Engineer of Dzongkhag |
| Budget Management at Preparatory Stage | WHO | Superintending Engineer, DRDS, MOA |
| | WHEN | Every Financial Year |
| | WHERE | MOA Office, Thimphu |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at Implementation Stage | WHO | DAO, Lhuntse Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Lhuntse Dzongkhag Agriculture Office |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at O&M Stage | WHO | Chairperson, WUA |
| | WHEN | Monthly basis |
| | WHERE | Accountant, WUA |
| | HOW | Constitution/Bylaws enacted in WUA |
| 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/ Agriculture Office, Dzongkhag at implementation stage/ WUA Office 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 Office discusses with the beneficiaries. Accident, Participation, Dispute: WUA Office discusses among the beneficiaries and third party. Manpower: DRDS, MOA discusses with the organization concerned. |

1.1.10 Denkaling (New)

I. General

Sheet No.

AP-10

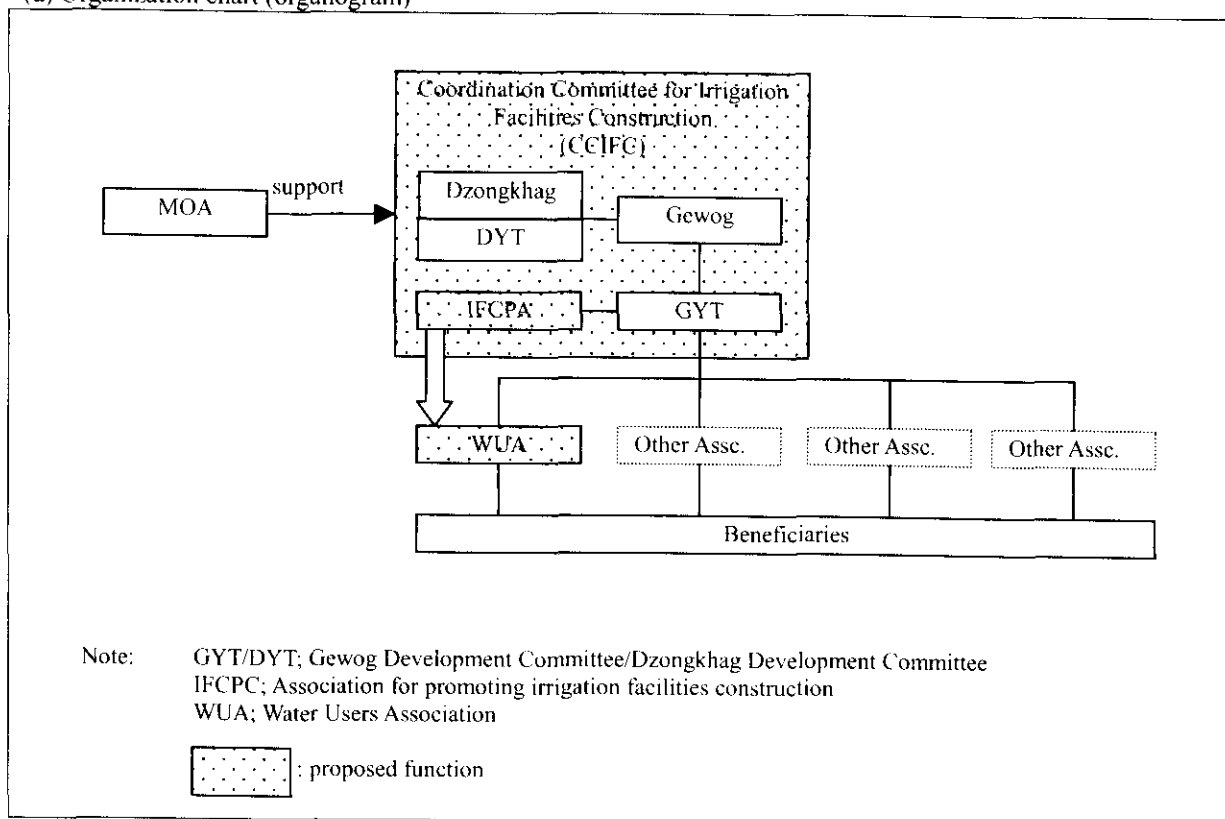
| | | | |
|--------------|--|---------------------|---|
| Program | Program for Food Crop Production Increase / Gangzur / Lhuntse | | |
| Sub-program | Irrigation Development Sub Program (Proposed, Denkaling) | | |
| Stakeholders | Level | Organization / Name | Contact Person |
| | National | MOA | Mr. Kaylzung Tshering (SE. DRDS, 02-322228) |
| | Dzongkhag | Lhuntse | Mr. Om Nath Giri (DE, 04-545128) Mr. Deepak Rai (DAO, 04-545127) |
| | Gewog | GYT | Mr. (Gup) |
| | Beneficiaries | Tentative WUA(18HH) | Mr. (DYT Member) |

II. Program/Sub-program

| | |
|-------------------------------------|---|
| Target | To increase food crop production, irrigated area=12.1ha |
| Activities | <ul style="list-style-type: none"> • Survey, Design and Cost estimation • Training for operation and maintenance including bookkeeping • Construction of irrigation facilities • Maintenance by Water Users Association • Procurement of construction materials and tools • Financial arrangement • Establishment of organization |
| Input | <ul style="list-style-type: none"> • Surveyor (Dzongkhag) • Irrigation Engineer for Design (Dzongkhag) • Irrigation Engineer for Supervision (Dzongkhag) • Construction Materials (DRDS, MOA) • Skilled Labor (Mason, Carpenter etc.) • Unskilled Labor (WUA) • Project Cost Nu. 1.2 mil. • Maintenance by Water Users Association |
| Output | Irrigation facilities are constructed to attain the food crop production increase. (canal length=4.0km, water management improvement) |
| Period(Tentative) | <ul style="list-style-type: none"> • Survey and Design 2003.7~2004.6 • Construction 2004.7~2007.6 • Operation & Maintenance 2007.7~ |
| Related Program / Sub-program (How) | <ul style="list-style-type: none"> • Program for Food Crop Production Increase/Food Security SP, Paddy-rice Production SP, Post-harvest Technology Training SP(They will be executed together with Irrigation Development SP) • Extension Strengthening Program/Extension Strengthening for Food Crop SP(Extension will be executed to the beneficiaries of constructed irrigation facilities) |
| Project Justification | <ul style="list-style-type: none"> • Environment: IEE was conducted in the Master Plan. As this is construction of canal by farmers themselves, it will be enough to assess by only the routine environmental checking by NEC to be executed before the commencement of construction and an authorization issuance of NEC will be applied by Dzongkhag. • Efficiency: Reasonable range of construction cost of canal per km is about 300,000 Nu estimated in 9th FYP in the maximum limitation. • Consistency with upper plan/program: This is based on the program of MOA. • Sustainability: The participation of beneficiaries, maintenance fund contribution and so on should be confirmed on the basis of the national irrigation policy procedural manual prepared by MOA |

III. Implementing Organization

(a) Organization chart (organogram)



(b) General Role and Responsibility of Stakeholders

| Stakeholder | | General Role and Responsibility |
|---------------|---|---|
| National | DRDS, MOA | Responsible for the program comprehensively in terms of finance, technical backstopping and coordination with other stakeholders. |
| Dzongkhag | Engineering Office/ Agriculture Office | Actually supervises WUA from its establishment to the construction and maintenance by WUA including accounting of the program. |
| Gewog | GYT | Formulate the Gewog development plan and evaluate the program in the plan, and based on this, made the official request letter and submit it to Dzongkhag. |
| Beneficiaries | WUA | Directly engages in the program and participate the construction and maintenance from at the stage of preliminary survey as unskilled labor free of charge. |

IV. Action Plan (sequent)

| Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|---|-------------------------------|---|
| 1 Establishment of institution for irrigation facilities construction | Gewog/GYT | An association for promoting irrigation facilities construction (IFCPA) will be tentatively established based on the petition from EA and beneficiaries under Gup in GYT. |
| 2 Consensus in GYT | GYT | The request of irrigation facilities construction from IFCPA will be discussed in GYT, and with the consensus will be proceeded to Dzongkhag. |
| 3 Official request (IRRIFORM.01) for implementation | GYT | The GYT member will prepare a request letter and the letter with the signature of Gup will be officially submitted to Dzongkhag with necessary information for evaluation (source of water, route, length, contribution by Gewogs or beneficiaries, etc.) |
| 4 Preliminary Investigations (Module 1) | Dzongkhag / IRCPA | The preliminary Investigations will be executed to find out whether the proposed request meets the basic requirements for government assistance. Project identification report (IRRIFORM.02) will be made for further procedure. |
| 5 Consensus in DYT | Dzongkhag / DYT | The request will be discussed based on the project identification report, and with the consensus and Dzongda's approval will be |

| Required Action (WHAT) | | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|------------------------|---|-------------------------------|---|
| | | | proceeded to MOA and MOF for further procedure for budget allocation. |
| 6 | Budget allocation for Multi-disciplinary Feasibility Study (Module 2) | Dzongkhag | The budget for Multi-disciplinary Feasibility Study will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 7 | Multi-disciplinary Feasibility Study (Module 2) | Dzongkhag | Multi-disciplinary Feasibility Study will be executed to determine whether the proposed request is viable or not and how it can be implemented. Therefore not only engineering survey but also interview survey for agriculture and social aspects have to be done with Gup, GYT member and water users. The feasibility study report (IRRIFORM.03) with a detailed implementation plan, tentative designs and estimation of the project cost will be made. |
| 8 | Environmental study | Dzongkhag / NEC | Based on the feasibility study report, if environmental study is required, EIA will be executed. |
| 9 | Budget allocation for construction | Dzongkhag | The budget for construction of irrigation facilities will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 10 | Pre-construction Meeting 1 (Module 3) | Dzongkhag | Explanation of the need of group/cooperative for construction and maintenance of irrigation facilities and Water Users Association Committee (WUA Committee named in Module 3) to IFCPA will be executed. Formation of Water Uses Association (IRRIFORM.04) and Letter of Undertaking (IRRIFORM.05) will be prepared and reviewed. |
| 11 | Pre-construction Meeting 2 (Module 4) | WUA/ GYT | Water Users Association (WUA) is established and committee members (IRRIFORM.04) will be selected from WUA. Signing of agreements on labor contribution for construction, maintenance fund contribution and compensation of water guard in the letter of understanding (IRRIFORM.05) will be executed between WUA and the representative of Dzongkhag in the meeting. |
| 12 | Land acquisition | WUA | Land acquisition and expropriation along the canal will be carried out under the instruction of Dzongkhag. |
| 13 | Procurement of materials and tools | Dzongkhag | Supplying materials and tools including technical backstopping from Dzongkhag for construction of irrigation facilities will be arranged based on the requisition of Dzongkhag in Implementation. |
| 14 | Overall management of construction | Dzongkhag | The construction of irrigation facilities will be carried out under the management of Dzongkhag in Implementation. |
| 15 | Arrangement of unskilled labor | WUA | WUA shall provide free unskilled labor in accordance with the arrangement of the site in-charge. |
| 16 | Development of WUA constitution and bylaws (Module 5) | WUA | Water users improve the organization and management of their irrigation system through establishing suitable constitution and bylaws. WUA Constitution and Bylaws (IRRIFORM.06) will be made. |
| 17 | Banking and bookkeeping training (Module 6) | Dzongkhag | Irrigation staff of Dzongkhag should support WUA to open a bank account for the maintenance fund and train them how to operate it. |
| 18 | Scheme management training (Module 7) | Dzongkhag | The training is held for the water users to know the types of support that the RGOB can give to the WUA for operation and maintenance. Project Completion Report (IRRIFORM.07) and Certificate of Satisfactory Completion (IRRIFORM.08) will be prepared. |
| 19 | Completion and Handing over | Dzongkhag/ WUA | The irrigation facilities shall be handed over to WUA after signing the Project Completion Report (IRRIFORM.07) and the Certificate of Satisfactory Completion (IRRIFORM.08). |
| 20 | Reserving fund for maintenance works | WUA | For the following maintenance, the fund will be reserved in the system of WUA. |

| Required Action (WHAT) | | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|------------------------|--|-------------------------------|--|
| 21 | Routine maintenance | WUA | Routine maintenance like canal cleaning, weeding will be periodically and timely carried out under the guidance of the site in-charge. |
| 22 | Periodical maintenance | WUA | Annual maintenance for natural calamity and unexpected disasters will be periodically carried out under the guidance of the site in-charge. |
| 23 | Periodical repair works | MOA/ WUA | Major repair will be executed using construction machinery to be arranged by CMU/MOA and Dzongkhag every five year, if necessary. |
| 24 | Establishment period inspection visit (Module 8) | Dzongkhag | Inspection and evaluation of the irrigation system will be executed to monitor and evaluate the condition of the irrigation system functioning WUA, crop productivity and assess the need for further Dzongkhag support in every 5 years. |
| 25 | Dzongkhag water users' association conference (Module 9) | Dzongkhag | This provides a forum where representatives of different WUAs can present and discuss progress, programs and problems. During the conference measures to overcome certain problems facing the WUAs can be framed jointly by the concerned WUA and the Dzongkhag irrigation sector. |

Note: FORM and Module are procedure regulated for irrigation facilities development by MOA.

V. Schedule

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|-----------------|------|------|------|------|------|------|------|------|------|------|------|
| 1 | Establishment of institution for irrigation facilities construction | 2003.4 | | □ | | | | | | | | | |
| 2 | Consensus in GYT | 2003.4 | | □ | | | | | | | | | |
| 3 | Official request (IRRIFORM.01) for implementation | 2003.4 | | □ | | | | | | | | | |
| 4 | Preliminary Investigations (Module 1) | 2003.5 | | □ | | | | | | | | | |
| 5 | Consensus in DYT | 2003.5 | | □ | | | | | | | | | |
| 6 | Budget allocation for Multi-disciplinary Feasibility Study (Module 2) | 2003.6 | | □ | | | | | | | | | |
| 7 | Multi-disciplinary Feasibility Study (Module 2) | 2003.7 - 2004.5 | | | □ | | | | | | | | |
| 8 | Environmental study | 2004.5 | | | □ | | | | | | | | |
| 9 | Budget allocation for construction | 2004.5 | | | □ | | | | | | | | |
| 10 | Pre-construction Meeting 1 (Module 3) | 2004.6 | | | □ | | | | | | | | |
| 11 | Pre-construction Meeting 2 (Module 4) | 2004.6 | | | □ | | | | | | | | |

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|--|-----------------|------|------|------|------|------|------|------|------|------|------|------|
| 12 | Land acquisition | 2004.4 - 2007.6 | | | | | | | | | | | |
| 13 | Procurement of materials and tools | 2004.4 - 2004.6 | | | | | | | | | | | |
| 14 | Overall management of construction | 2004.7 - 2007.6 | | | | | | | | | | | |
| 15 | Arrangement of unskilled labor | 2004.7 - 2007.6 | | | | | | | | | | | |
| 16 | Development of WUA constitution and bylaws (Module 5) | 2004.7 | | | | | | | | | | | |
| 17 | Banking and bookkeeping training (Module 6) | 2004.7 | | | | | | | | | | | |
| 18 | Scheme management training (Module 7) | 2007.6 | | | | | | | | | | | |
| 19 | Completion and Handing over | 2007.6 | | | | | | | | | | | |
| 20 | Reserving fund for maintenance works | 2007.1 - | | | | | | | | | | | |
| 21 | Routine maintenance | 2007.7 - | | | | | | | | | | | |
| 22 | Periodical maintenance | 2008.7 - | | | | | | | | | | | |
| 23 | Periodical repair works | 2012.6 - | | | | | | | | | | | |
| 24 | Establishment period inspection visit (Module 8) | 2007.11 - | | | | | | | | | | | |
| 25 | Dzongkhag water users' association conference (Module 9) | 2008.1 - | | | | | | | | | | | |

VI. Implementation and Monitoring System

| Action | Plan |
|---|---|
| Progress Management of A/P | WHO DE/DAO, Lhuntse Dzongkhag |
| | WHEN Monthly basis |
| | WHERE Lhuntse Dzongkhag Engineering/Agriculture Office |
| | HOW Monthly Report prepared by Site Engineer of Dzongkhag |
| Budget Management at Preparatory Stage | WHO Superintending Engineer, DRDS, MOA |
| | WHEN Every Financial Year |
| | WHERE MOA Office, Thimphu |
| | HOW As per Financial Manual of Royal Government of Bhutan |
| Budget Management at Implementation Stage | WHO DAO, Lhuntse Dzongkhag |
| | WHEN Monthly basis |
| | WHERE Lhuntse Dzongkhag Agriculture Office |
| | HOW As per Financial Manual of Royal Government of Bhutan |
| Budget Management at O&M Stage | WHO Chairperson, WUA |
| | WHEN Monthly basis |

| | | |
|-----------------|-------|--|
| | WHERE | Accountant, WUA |
| | HOW | Constitution/Bylaws enacted in WUA |
| 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/ Agriculture Office, Dzongkhag at implementation stage/ WUA Office 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 Office discusses with the beneficiaries. Accident, Participation, Dispute: WUA Office discusses among the beneficiaries and third party. Manpower: DRDS, MOA discusses with the organization concerned. |

1.2.1 Chaskhar Scheme (Rehabilitation)

I. General

Sheet No. AP-11

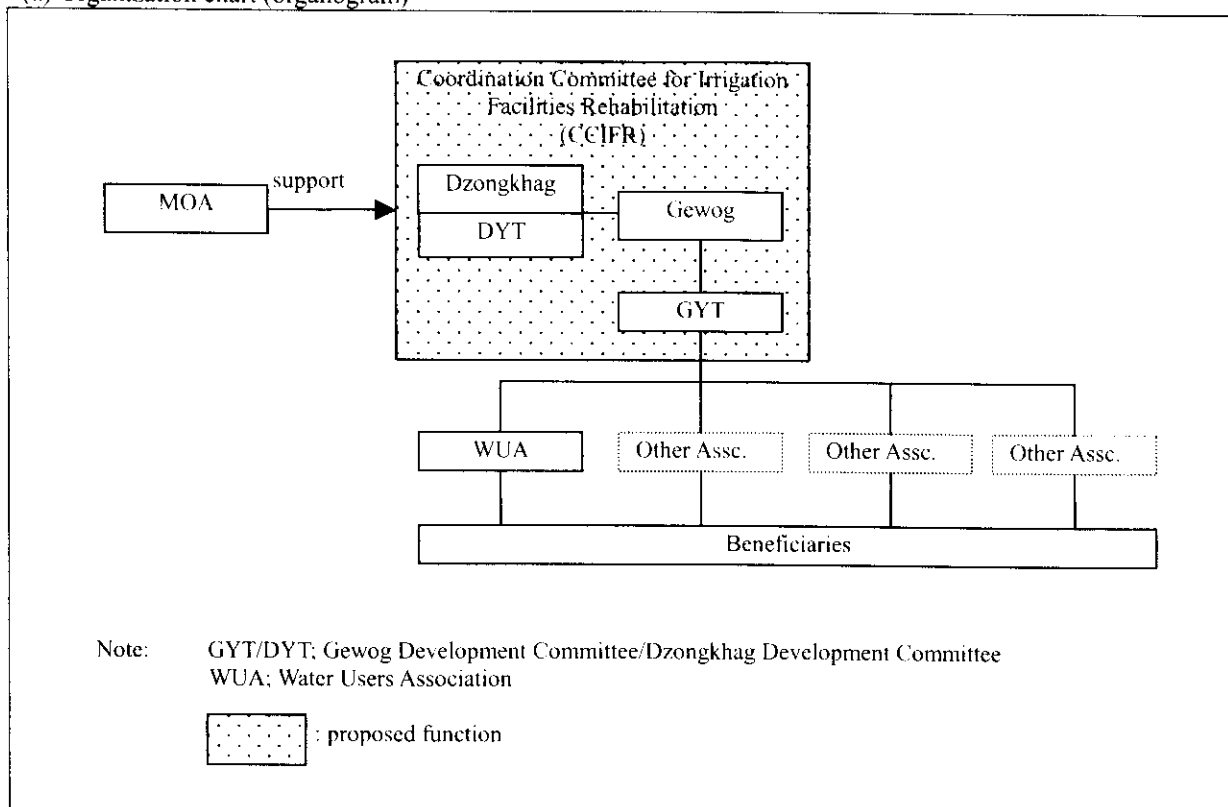
| | | | |
|--------------|--|---------------------|--|
| Program | Program for Food Crop Production Increase / Chaskhar / Mongar | | |
| Sub-program | Irrigation Development Sub Program (Rehabilitation, Chaskhar) | | |
| Stakeholders | Level | Organization / Name | Contact Person |
| | National | MOA | Mr. Kaylzung Tshering (SE. DRDS, 02-322228) |
| | Dzongkhag | Mongar | Mr. Penden Norgey (DE, 04-641206) Mr. Tandin Dorji (DAO, 04-641181) |
| | Gewog | GYT | Mr. Coeda (Gup) |
| | Beneficiaries | WUA (250HH) | Mr. (Chairman) |

II. Program/Sub-program

| | | |
|-------------------------------------|---|--|
| Target | To increase food crop production, length of canal to be rehabilitated = 7.0 km | |
| Activities | <ul style="list-style-type: none"> • Survey, Plan and Cost estimation • Rehabilitation of irrigation facilities • Maintenance by Water Users Association • Procurement of construction materials and tools • Financial arrangement | |
| Input | <ul style="list-style-type: none"> • Surveyor (Dzongkhag) • Irrigation Engineer for Rehabilitation Plan (Dzongkhag) • Irrigation Engineer for Supervision (Dzongkhag) • Construction Materials (DRDS, MOA) • Skilled Labor (Mason, Carpenter etc.) • Unskilled Labor (WUA) • Project Cost Nu. 0.924 mil. • Maintenance by Water Users Association | |
| Output | <ul style="list-style-type: none"> • The existing irrigation facilities are rehabilitated to attain the food crop production increase. (Irrigated area=44.5ha) Environment: IEE was conducted in the Master Plan. As this is actually rehabilitation of irrigation facilities, it will be enough to assess by only the routine environmental checking by NEC to be executed before the commencement of rehabilitation and an authorization issuance of NEC will be applied by Dzongkhag. • Efficiency: Reasonable range of rehabilitation cost of canal per km is about 132,000 Nu estimated in 9th FYP in the maximum limitation. • Consistency with upper plan/program: This is based on the program of MOA. • Sustainability: The participation of beneficiaries, maintenance fund contribution and so on should be confirmed on the basis of the national irrigation policy procedural manual prepared by MOA. | |
| Period (Tentative) | <ul style="list-style-type: none"> • Survey and Plan 2003.7~2004.6 • Rehabilitation 2004.7~2007.6 • Maintenance 2007.7~ | |
| Related Program / Sub-program (How) | <ul style="list-style-type: none"> • Program for Food Crop Production Increase/Food Security SP, Paddy-rice Production SP, Post-harvest Technology Training SP(They will be executed together with Irrigation Development SP) • Extension Strengthening Program/Extension Strengthening for Food Crop SP(Extension will be executed to the beneficiaries of rehabilitated irrigation facilities) | |
| Project Justification | <ul style="list-style-type: none"> • Environment: IEE was conducted in the Master Plan. As this is actually rehabilitation of irrigation facilities, it will be enough to assess by only the routine environmental checking by NEC to be executed before the commencement of rehabilitation and an authorization issuance of NEC will be applied by Dzongkhag. • Efficiency: Reasonable range of rehabilitation cost of canal per km is about 132,000 Nu estimated in 9th FYP in the maximum limitation. • Consistency with upper plan/program: This is based on the program of MOA. • Sustainability: The participation of beneficiaries, maintenance fund contribution and so on should be confirmed on the basis of the national irrigation policy procedural manual prepared by MOA. | |

III. Implementing Organization

(a) Organization chart (organogram)



(b) General Role and Responsibility of Stakeholders

| Stakeholder | | General Role and Responsibility |
|---------------|---|--|
| National | DRDS, MOA | Responsible for the program comprehensively in terms of finance, technical backstopping and coordination with other stakeholders. |
| Dzyongkhag | Engineering Office/ Agriculture Office | Actually supervises WUA from rehabilitation and maintenance by WUA including accounting of the program. |
| Gewog | GYT | Formulate the Gewog rehabilitation plan and evaluate the program in the plan, and based on this, made the official request letter and submit it to Dzyongkhag. |
| Beneficiaries | WUA | Directly engages in the program and participate the rehabilitation and maintenance from at the inspection of facilities as unskilled labor free of charge. |

IV. Action Plan (sequent)

| Required Action (WHAT) | | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|------------------------|---|-------------------------------|--|
| 1 | Consensus in GYT | GYT | The request of irrigation facilities rehabilitation from WUA will be discussed in GYT and with the consensus will be proceeded to Dzyongkhag. |
| 2 | Official request (IRRIFORM.01) for rehabilitation | GYT | The GYT member will prepare a request letter and the letter with the signature of Gup will be officially submitted to Dzyongkhag with necessary information for evaluation (required works, contribution by Gewogs or beneficiaries, etc.) |
| 3 | Inspection of facilities to be rehabilitated | Dzyongkhag/ WUA | The inspection will be executed to find out whether the proposed request meets the basic requirements for government assistance. The rehabilitation identification report will be made for further procedure referring to Module 1. |
| 4 | Consensus in DYT | Dzyongkhag / DYT | The request will be discussed based on the rehabilitation identification report, and with the consensus and Dzyongda's approval will be proceeded to MOA and MOF for further procedure for budget allocation. |
| 5 | Budget allocation for | Dzyongkhag | The budget for rehabilitation survey will be arranged in MOF after |

| Required Action (WHAT) | | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|------------------------|---|-------------------------------|---|
| | rehabilitation survey | | scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 6 | Survey and plan for rehabilitation | Dzongkhag | Rehabilitation survey will be executed to determine whether the proposed request is reasonable and necessary or not. The rehabilitation survey report with a detailed rehabilitation plan, countermeasures for the problems and estimation of the rehabilitation cost will be made referring to Module 2. |
| 7 | Budget allocation for rehabilitation | Dzongkhag | The budget for rehabilitation of irrigation facilities will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 8 | Procurement of materials and tools | Dzongkhag | Supplying materials and tools including technical backstopping from Dzongkhag for rehabilitation of irrigation facilities will be arranged based on the requisition of Dzongkhag in Implementation. |
| 9 | Overall management of rehabilitation | Dzongkhag | The rehabilitation of irrigation facilities will be carried out under the management of Dzongkhag in Implementation. |
| 10 | Arrangement of unskilled labor | WUA | WUA shall provide free unskilled labor in accordance with the arrangement of the site in-charge. |
| 11 | Reserving fund for maintenance works | WUA | For the following maintenance, the fund will be reserved in the system of WUA as same as the proposed irrigation scheme. |
| 12 | Routine maintenance | WUA | Routine maintenance like canal cleaning, weeding will be periodically and timely carried out under the guidance of the site in-charge after rehabilitation. |
| 13 | Periodical maintenance | WUA | Annual maintenance for natural calamity and unexpected disasters will be periodically carried out under the guidance of the site in-charge after rehabilitation. |
| 14 | Periodical repair works | MOA/ WUA | Major repair will be executed using construction machinery to be arranged by CMU/MOA and Dzongkhag every five year after rehabilitation, if necessary. |
| 15 | Establishment period inspection visit | Dzongkhag | Inspection and evaluation of the irrigation system will be executed each year during the establishment period (in five years after the rehabilitation) to monitor and evaluate the condition of the irrigation system, functioning WUA, crop productivity and assess the need for further Dzongkhag support in accordance with Module 8. |
| 16 | Dzongkhag water users' association conference | Dzongkhag | This provides a forum where representatives of different WUAs can present and discuss progress, programs and problems. each year during the establishment period (in five years after the rehabilitation) During the conference measures to overcome certain problems facing the WUAs can be framed jointly by the concerned WUA and the Dzongkhag irrigation sector in accordance with Module 9. |

Note: FORM and Module are procedure regulated for irrigation facilities development by MOA, the irrigation facilities rehabilitation program will follow this procedure as well.

V. Schedule

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|--------|------|------|------|------|------|------|------|------|------|------|------|
| 1 | Consensus in GYT | 2003.4 | | | | | | | | | | | |
| 2 | Official request (IRRIFORM.01) for rehabilitation | 2003.4 | | | | | | | | | | | |
| 3 | Inspection of facilities to be rehabilitated | 2003.5 | | | | | | | | | | | |

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|-------------------|------|------|------|------|------|------|------|------|------|------|------|
| 4 | Consensus in DYT | 2003.5 | | □ | | | | | | | | | |
| 5 | Budget allocation for rehabilitation survey | 2003.6 | | □ | | | | | | | | | |
| 6 | Survey and plan estimation for rehabilitation | 2003.7 - 2004.3 | | □ | | | | | | | | | |
| 7 | Budget allocation for rehabilitation | 2004.3 | | | □ | | | | | | | | |
| 8 | Procurement of materials and tools | 2004.4 - 2004.6 | | | □ | | | | | | | | |
| 9 | Overall management of rehabilitation | 2004.7 - 2007.6 | | | | □ | | | | | | | |
| 10 | Arrangement of unskilled labor | 2004.7 - 2007.6 | | | | □ | | | | | | | |
| 11 | Reserving fund for maintenance works | 2007.1 - | | | | | | | □ | | | | |
| 12 | Routine maintenance | 2007.7 - | | | | | | | □ | | | | |
| 13 | Periodical maintenance | 2008.7 - | | | | | | | □ | □ | □ | □ | □ |
| 14 | Periodical repair works | 2012.6 - | | | | | | | | | | | □ |
| 15 | Establishment period inspection visit | 2007.11 - 2011.11 | | | | | | | □ | □ | □ | □ | □ |
| 16 | Dzongkhag water users' association conference | 2008.1 - | | | | | | | □ | □ | □ | □ | □ |

VI. Implementation and Monitoring System

| Action | Plan | |
|---|-------|---|
| Progress Management of A/P | WHO | DE/DAO, Mongar Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Mongar Dzongkhag Engineering/Agriculture Office |
| | HOW | Monthly Report prepared by Site Engineer of Dzongkhag |
| Budget Management at Preparatory Stage | WHO | Superintending Engineer, DRDS, MOA |
| | WHEN | Every Financial Year |
| | WHERE | MOA Office, Thimphu |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at Implementation Stage | WHO | DAO, Mongar Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Mongar Dzongkhag Agriculture Office |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at O&M Stage | WHO | Chairperson, WUA |
| | WHEN | Monthly basis |
| | WHERE | Accountant, WUA |
| | HOW | Constitution/Bylaws enacted in WUA |

| | | |
|-----------------|-------|--|
| 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/ Agriculture Office, Dzongkhag at implementation stage/ WUA Office 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 Office discusses with the beneficiaries. Accident, Participation, Dispute: WUA Office discusses among the beneficiaries and third party. Manpower: DRDS, MOA discusses with the organization concerned. |

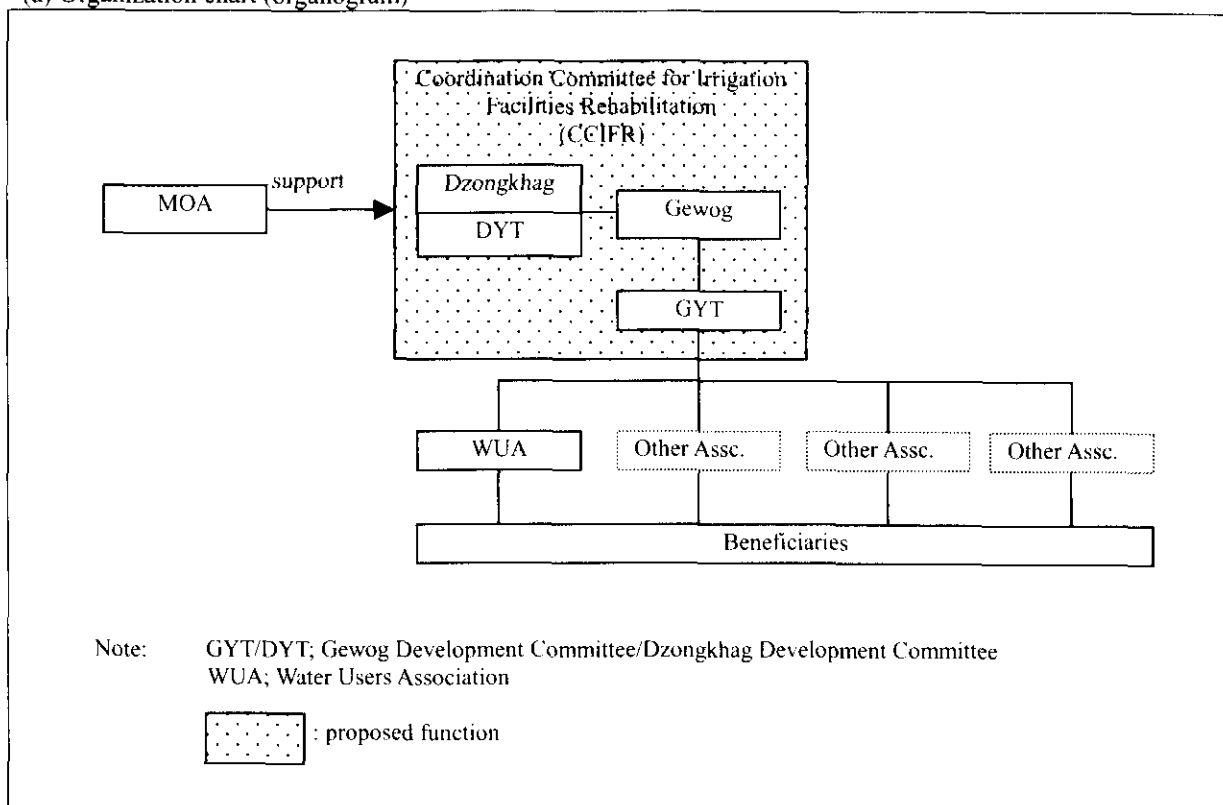
1.2.2 Kharanang Scheme (Rehabilitation)

| | | | |
|-------------------|--|---------------------|--|
| I. General | | Sheet No. | AP-12 |
| Program | Program for Food Crop Production Increase / Chaskhar / Mongar | | |
| Sub-program | Irrigation Development Sub Program (Rehabilitation, Kharanang) | | |
| Stakeholders | Level | Organization / Name | Contact Person |
| | National | MOA | Mr. Kayljang Tshering (SE. DRDS, 02-322228) |
| | Dzongkhag | Mongar | Mr. Penden Norgey (DE, 04-641206) Mr. Tandin Dorji (DAO, 04-641181) |
| | Gewog | GYT | Mr. Coeda (Gup) |
| | Beneficiaries | WUA (100 HH) | Mr. (Chairman) |

| | |
|-------------------------------------|---|
| II. Program/Sub-program | |
| Target | To increase food crop production, length of canal to be rehabilitated=2.5km |
| Activities | <ul style="list-style-type: none"> • Survey, Plan and Cost estimation • Rehabilitation of irrigation facilities • Maintenance by Water Users Association • Procurement of construction materials and tools • Financial arrangement |
| Input | <ul style="list-style-type: none"> • Surveyor (Dzongkhag) • Irrigation Engineer for Rehabilitation Plan (Dzongkhag) • Irrigation Engineer for Supervision (Dzongkhag) • Construction Materials (DRDS, MOA) • Skilled Labor (Mason, Carpenter etc.) • Unskilled Labor (WUA) • Project Cost Nu. 0.33 mil. • Maintenance by Water Users Association |
| Output | The existing irrigation facilities are rehabilitated to attain the food crop production increase. (Irrigated area=20.2ha) |
| Period (Tentative) | <ul style="list-style-type: none"> • Survey and Plan 2003.1~2003.6 • Rehabilitation 2003.7~2006.6 • Maintenance 2006.7~ |
| Related Program / Sub-program (How) | <ul style="list-style-type: none"> • Program for Food Crop Production Increase/Food Security SP, Paddy-rice Production SP, Post-harvest Technology Training SP(They will be executed together with Irrigation Development SP) • Extension Strengthening Program/Extension Strengthening for Food Crop SP(Extension will be executed to the beneficiaries of rehabilitated irrigation facilities) |
| Project Justification | <ul style="list-style-type: none"> • Environment: IEE was conducted in the Master Plan. As this is actually rehabilitation of irrigation facilities, it will be enough to assess by only the routine environmental checking by NEC to be executed before the commencement of rehabilitation and an authorization issuance of NEC will be applied by Dzongkhag. • Efficiency: Reasonable range of rehabilitation cost of canal per km is about 132,000 Nu estimated in 9th FYP in the maximum limitation. • Consistency with upper plan/program: This is based on the program of MOA. • Sustainability: The participation of beneficiaries, maintenance fund contribution and so on should be confirmed on the basis of the national irrigation policy procedural manual prepared by MOA. |

III. Implementing Organization

(a) Organization chart (organogram)



(b) General Role and Responsibility of Stakeholders

| Stakeholder | | General Role and Responsibility |
|---------------|---|---|
| National | DRDS, MOA | Responsible for the program comprehensively in terms of finance, technical backstopping and coordination with other stakeholders. |
| Dzongkhag | Engineering Office/ Agriculture Office | Actually supervises WUA from rehabilitation and maintenance by WUA including accounting of the program. |
| Gewog | GYT | Formulate the Gewog rehabilitation plan and evaluate the program in the plan, and based on this, made the official request letter and submit it to Dzongkhag. |
| Beneficiaries | WUA | Directly engages in the program and participate the rehabilitation and maintenance from at the inspection of facilities as unskilled labor free of charge. |

IV. Action Plan (sequent)

| | Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|---|---|-------------------------------|---|
| 1 | Consensus in GYT | GYT | The request of irrigation facilities rehabilitation from WUA will be discussed in GYT and with the consensus will be proceeded to Dzongkhag. |
| 2 | Official request (IRRIFORM.01) for rehabilitation | GYT | The GYT member will prepare a request letter and the letter with the signature of Gup will be officially submitted to Dzongkhag with necessary information for evaluation (required works, contribution by Gewogs or beneficiaries, etc.) |
| 3 | Inspection of facilities to be rehabilitated | Dzongkhag/ WUA | The inspection will be executed to find out whether the proposed request meets the basic requirements for government assistance. The rehabilitation identification report will be made for further procedure referring to Module 1. |
| 4 | Consensus in DYT | Dzongkhag / DYT | The request will be discussed based on the rehabilitation identification report, and with the consensus and Dzongda's approval will be proceeded to MOA and MOF for further procedure for budget allocation. |
| 5 | Budget allocation for | Dzongkhag | The budget for rehabilitation survey will be arranged in MOF after |

| Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|--|-------------------------------|--|
| rehabilitation survey | | scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 6 Survey and plan for rehabilitation | Dzongkhag | Rehabilitation survey will be executed to determine whether the proposed request is reasonable and necessary or not. The rehabilitation survey report with a detailed rehabilitation plan, countermeasures for the problems and estimation of the rehabilitation cost will be made referring to Module 2. |
| 7 Budget allocation for rehabilitation | Dzongkhag | The budget for rehabilitation of irrigation facilities will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 8 Procurement of materials and tools | Dzongkhag | Supplying materials and tools including technical backstopping from Dzongkhag for rehabilitation of irrigation facilities will be arranged based on the requisition of Dzongkhag in Implementation. |
| 9 Overall management of rehabilitation | Dzongkhag | The rehabilitation of irrigation facilities will be carried out under the management of Dzongkhag in Implementation. |
| 10 Arrangement of unskilled labor | WUA | WUA shall provide free unskilled labor in accordance with the arrangement of the site in-charge. |
| 11 Reserving fund for maintenance works | WUA | For the following maintenance, the fund will be reserved in the system of WUA as same as the proposed irrigation scheme. |
| 12 Routine maintenance | WUA | Routine maintenance like canal cleaning, weeding will be periodically and timely carried out under the guidance of the site in-charge after rehabilitation. |
| 13 Periodical maintenance | WUA | Annual maintenance for natural calamity and unexpected disasters will be periodically carried out under the guidance of the site in-charge after rehabilitation. |
| 14 Periodical repair works | MOA/ WUA | Major repair will be executed using construction machinery to be arranged by CMU/MOA and Dzongkhag every five year after rehabilitation, if necessary. |
| 15 Establishment period inspection visit | Dzongkhag | Inspection and evaluation of the irrigation system will be executed each year during the establishment period (in five years after the rehabilitation) to monitor and evaluate the condition of the irrigation system, functioning WUA, crop productivity and assess the need for further Dzongkhag support in accordance with Module 8. |
| 16 Dzongkhag water users' association conference | Dzongkhag | This provides a forum where representatives of different WUAs can present and discuss progress, programs and problems. each year during the establishment period(in five years after the rehabilitation) During the conference measures to overcome certain problems facing the WUAs can be framed jointly by the concerned WUA and the Dzongkhag irrigation sector in accordance with Module 9. |

Note: FORM and Module are procedure regulated for irrigation facilities development by MOA, the irrigation facilities rehabilitation program will follow this procedure as well.

V. Schedule

| Required Action (WHAT) | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|--------|------|------|------|------|------|------|------|------|------|------|------|
| 1 Consensus in GYT | 2003.1 | | | | | | | | | | | |
| 2 Official request (IRRIFORM.01) for rehabilitation | 2003.1 | | | | | | | | | | | |
| 3 Inspection of facilities to be rehabilitated | 2003.2 | | | | | | | | | | | |

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|-------------------|------|------|------|------|------|------|------|------|------|------|------|
| 4 | Consensus in DYT | 2003.2 | | □ | | | | | | | | | |
| 5 | Budget allocation for rehabilitation survey | 2003.3 | | □ | | | | | | | | | |
| 6 | Survey and plan estimation for rehabilitation | 2003.3 - 2003.5 | | □ | | | | | | | | | |
| 7 | Budget allocation for rehabilitation | 2003.5 | | □ | | | | | | | | | |
| 8 | Procurement of materials and tools | 2003.5 - 2003.6 | | □ | | | | | | | | | |
| 9 | Overall management of rehabilitation | 2003.7 - 2006.6 | | □ | | | | | | | | | |
| 10 | Arrangement of unskilled labor | 2003.7 - 2006.6 | | □ | | | | | | | | | |
| 11 | Reserving fund for maintenance works | 2006.1 - | | | | | □ | | | | | | |
| 12 | Routine maintenance | 2006.7 - | | | | | □ | | | | | | |
| 13 | Periodical maintenance | 2007.7 - | | | | | □ | □ | □ | □ | □ | □ | |
| 14 | Periodical repair works | 2011.6 - | | | | | | | | | | □ | |
| 15 | Establishment period inspection visit | 2006.11 - 2010.11 | | | | | □ | □ | □ | □ | □ | | |
| 16 | Dzongkhag water users' association conference | 2007.1 - | | | | | □ | □ | □ | □ | □ | □ | |

VI. Implementation and Monitoring System

| Action | Plan | |
|---|-------|--|
| Progress Management of A/P | WHO | DE/DAO, Mongar Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Mongar Dzongkhag Engineering/Agriculture Office |
| | HOW | Monthly Report prepared by Site Engineer of Dzongkhag |
| Budget Management at Preparatory Stage | WHO | Superintending Engineer, DRDS, MOA |
| | WHEN | Every Financial Year |
| | WHERE | MOA Office, Thimphu |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at Implementation Stage | WHO | DAO, Mongar Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Mongar Dzongkhag Agriculture Office |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at O&M Stage | WHO | Chairperson, WUA |
| | WHEN | Monthly basis |
| | WHERE | Accountant, WUA |
| | HOW | Constitution/Bylaws enacted in WUA |
| 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/ Agriculture Office, Dzongkhag at implementation stage/ WUA Office 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 Office discusses with the beneficiaries. Accident, Participation, Dispute: WUA Office discusses among the beneficiaries and third party. Manpower: DRDS, MOA discusses with the organization concerned. |

1.2.3 Phakhdang Scheme (New)

I. General

Sheet No.

AP-13

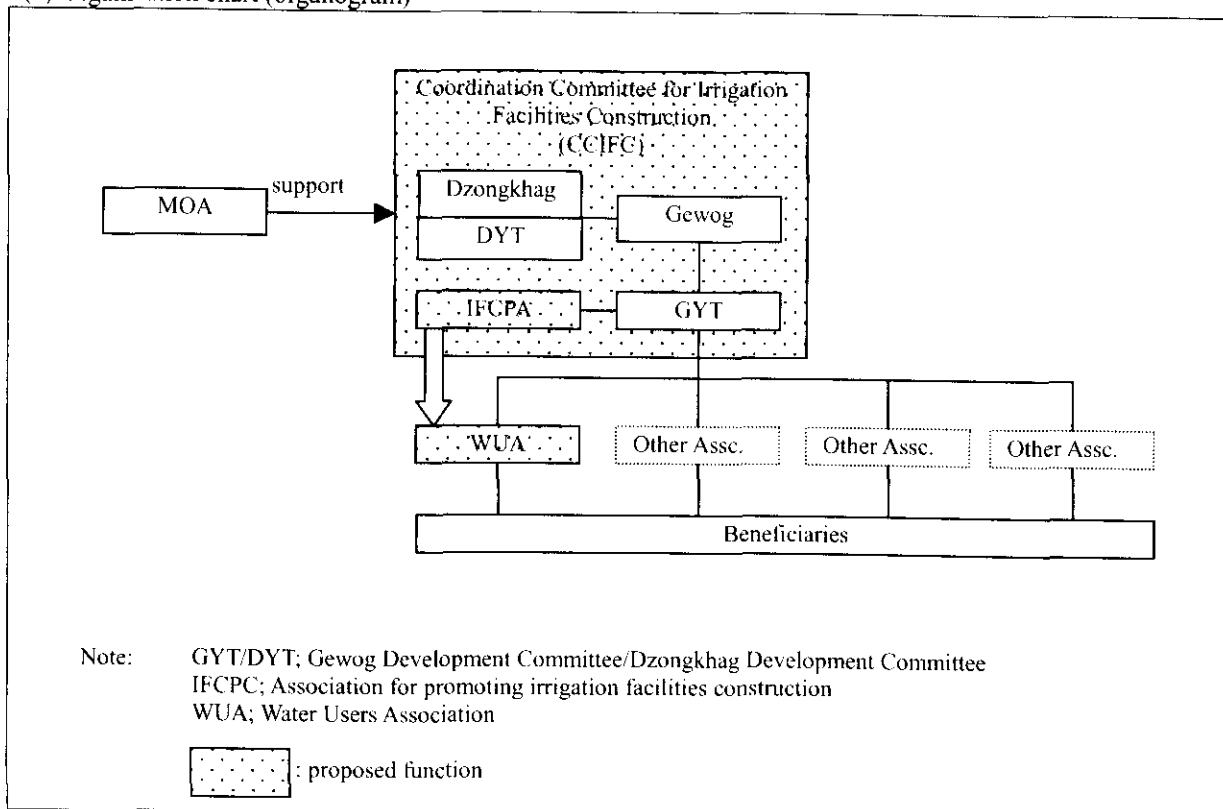
| | | | |
|--------------|--|---------------------|---|
| Program | Program for Food Crop Production Increase / Chaskhar / Mongar | | |
| Sub-program | Irrigation Development Sub Program (Proposed, Phakhdang) | | |
| Stakeholders | Level | Organization / Name | Contact Person |
| | National | MOA | Mr. Kayljang Tshering (SE. DRDS, 02-322228) |
| | Dzongkhag | Mongar | Mr. Penden Norgy (DE, 04-641206) Mr. Tandin Dorji (DAO, 04-641181) |
| | Gewog | GYT | Mr. Cheda (Gup) |
| | Beneficiaries | Tentative WUA(30HH) | Mr. (GYT Member) |

II. Program/Sub-program

| | |
|-------------------------------------|---|
| Target | To increase food crop production, proposed canal length=5.0km |
| Activities | <ul style="list-style-type: none"> • Survey, Design and Cost estimation • Construction of irrigation facilities • Maintenance by Water Users Association • Procurement of construction materials and tools • Financial arrangement • Establishment of organization |
| Input | <ul style="list-style-type: none"> • Surveyor (Dzongkhag) • Irrigation Engineer for Design (Dzongkhag) • Irrigation Engineer for Supervision (Dzongkhag) • Construction Materials (DRDS, MOA) • Skilled Labor (Mason, Carpenter etc.) • Unskilled Labor (WUA) • Project Cost Nu. 1.50 mil. • Maintenance by Water Users Association |
| Output | Irrigation facilities are constructed to attain the food crop production increase. (Irrigated area=20.2ha) |
| Period(Tentative) | <ul style="list-style-type: none"> • Survey and Design 2004.10~2004.4 • Construction 2004.5~2005.5 • Operation & Maintenance 2005.6~ |
| Related Program / Sub-program (How) | <ul style="list-style-type: none"> • Program for Food Crop Production Increase/Food Security SP, Paddy-rice Production SP, Post-harvest Technology Training SP(They will be executed together with Irrigation Development SP) • Extension Strengthening Program/Extension Strengthening for Food Crop SP(Extension will be executed to the beneficiaries of rehabilitated irrigation facilities) |
| Project Justification | <ul style="list-style-type: none"> • Environment: IEE was conducted in the Master Plan. As this is construction of canal by farmers themselves, it will be enough to assess by only the routine environmental checking by NEC to be executed before the commencement of construction and an authorization issuance of NEC will be applied by Dzongkhag. • Efficiency: Reasonable range of construction cost of canal per km is about 300,000 Nu estimated in 9th FYP in the maximum limitation. • Consistency with upper plan/program: This is based on the program of MOA. • Sustainability: The participation of beneficiaries, maintenance fund contribution and so on should be confirmed on the basis of the national irrigation policy procedural manual prepared by MOA |

III. Implementing Organization

(a) Organization chart (organogram)



(b) General Role and Responsibility of Stakeholders

| Stakeholder | | General Role and Responsibility |
|---------------|---|---|
| National | DRDS, MOA | Responsible for the program comprehensively in terms of finance, technical backstopping and coordination with other stakeholders. |
| Dzungkhag | Engineering Office/ Agriculture Office | Actually supervises WUA from its establishment to the construction and maintenance by WUA including accounting of the program. |
| Gewog | GYT | Formulate the Gewog development plan and evaluate the program in the plan, and based on this, made the official request letter and submit it to Dzungkhag. |
| Beneficiaries | WUA | Directly engages in the program and participate the construction and maintenance from at the stage of preliminary survey as unskilled labor free of charge. |

IV. Action Plan (sequent)

| | Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|---|---|-------------------------------|---|
| 1 | Establishment of institution for irrigation facilities construction | Gewog/GYT | An association for promoting irrigation facilities construction (IFCPA) will be tentatively established based on the petition from EA and beneficiaries under Gup in GYT. |
| 2 | Consensus in GYT | GYT | The request of irrigation facilities construction from IFCPA will be discussed in GYT, and with the consensus will be proceeded to Dzungkhag. |
| 3 | Official request (IRRIFORM.01) for implementation | GYT | The GYT member will prepare a request letter and the letter with the signature of Gup will be officially submitted to Dzungkhag with necessary information for evaluation (source of water, route, length, contribution by Gewogs or beneficiaries, etc.) |
| 4 | Preliminary Investigations (Module 1) | Dzungkhag / IFCPA | The preliminary Investigations will be executed to find out whether the proposed request meets the basic requirements for government assistance. Project identification report (IRRIFORM.02) will be made for further procedure. |
| 5 | Consensus in DYT | Dzungkhag / DYT | The request will be discussed based on the project identification report, and with the consensus and Dzungda's approval will be |

| | Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|----|---|-------------------------------|---|
| | | | proceeded to either MOA or MOF for further procedure for budget allocation. |
| 6 | Budget allocation for Multi-disciplinary Feasibility Study (Module 2) | Dzongkhag | The budget for Multi-disciplinary Feasibility Study will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 7 | Multi-disciplinary Feasibility Study (Module 2) | Dzongkhag | Multi-disciplinary Feasibility Study will be executed to determine whether the proposed request is viable or not and how it can be implemented. Therefore not only engineering survey but also interview survey for agriculture and social aspects have to be done with Gup, GYT member and water users. The feasibility study report (IRRIFORM.03) with a detailed implementation plan, tentative designs and estimation of the project cost will be made. |
| 8 | Environmental study | Dzongkhag / NEC | Based on the feasibility study report, if environmental study is required, EIA will be executed. |
| 9 | Budget allocation for construction | Dzongkhag | The budget for construction of irrigation facilities will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 10 | Pre-construction Meeting 1 (Module 3) | Dzongkhag | Explanation of the need of group/cooperative for construction and maintenance of irrigation facilities and Water Users Association Committee (WUA Committee named in Module 3) to IFCPA will be executed. Formation of Water Uses Association (IRRIFORM.04) and Letter of Undertaking (IRRIFORM.05) will be prepared and reviewed. |
| 11 | Pre-construction Meeting 2 (Module 4) | WUA/ GYT | Water Users Association (WUA) is established and committee members (IRRIFORM.04) will be selected from WUA. Signing of agreements on labor contribution for construction, maintenance fund contribution and compensation of water guard in the letter of understanding (IRRIFORM.05) will be executed between WUA and the representative of Dzongkhag in the meeting. |
| 12 | Land acquisition | WUA | Land acquisition and expropriation along the canal will be carried out under the instruction of Dzongkhag. |
| 13 | Procurement of materials and tools | Dzongkhag | Supplying materials and tools including technical backstopping from Dzongkhag for construction of irrigation facilities will be arranged based on the requisition of Dzongkhag in Implementation. |
| 14 | Overall management of construction | Dzongkhag | The construction of irrigation facilities will be carried out under the management of Dzongkhag in Implementation. |
| 15 | Arrangement of unskilled labor | WUA | WUA shall provide free unskilled labor in accordance with the arrangement of the site in-charge. |
| 16 | Development of WUA constitution and bylaws (Module 5) | WUA | Water users improve the organization and management of their irrigation system through establishing suitable constitution and bylaws. WUA Constitution and Bylaws (IRRIFORM.06) will be made. |
| 17 | Banking and bookkeeping training (Module 6) | Dzongkhag | Irrigation staff of Dzongkhag should support WUA to open a bank account for the maintenance fund and train them how to operate it. |
| 18 | Scheme management training (Module 7) | Dzongkhag | The training is held for the water users to know the types of support that the RGOB can give to the WUA for operation and maintenance. Project Completion Report (IRRIFORM.07) and Certificate of Satisfactory Completion (IRRIFORM.08) will be prepared. |
| 19 | Completion and Handing over | Dzongkhag/ WUA | The irrigation facilities shall be handed over to WUA after signing the Project Completion Report (IRRIFORM.07) and the Certificate of Satisfactory Completion (IRRIFORM.08). |
| 20 | Reserving fund for maintenance works | WUA | For the following maintenance, the fund will be reserved in the system of WUA. |

| Required Action (WHAT) | | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|------------------------|--|-------------------------------|--|
| 21 | Routine maintenance | WUA | Routine maintenance like canal cleaning, weeding will be periodically and timely carried out under the guidance of the site in-charge. |
| 22 | Periodical maintenance | WUA | Annual maintenance for natural calamity and unexpected disasters will be periodically carried out under the guidance of the site in-charge. |
| 23 | Periodical repair works | MOA/ WUA | Major repair will be executed using construction machinery to be arranged by CMU/MOA and Dzongkhag every five year, if necessary. |
| 24 | Establishment period inspection visit (Module 8) | Dzongkhag | Inspection and evaluation of the irrigation system will be executed to monitor and evaluate the condition of the irrigation system, functioning WUA, crop productivity and assess the need for further Dzongkhag support in every 5 years. |
| 25 | Dzongkhag water users' association conference (Module 9) | Dzongkhag | This provides a forum where representatives of different WUAs can present and discuss progress, programs and problems. During the conference measures to overcome certain problems facing the WUAs can be framed jointly by the concerned WUA and the Dzongkhag irrigation sector. |

Note: FORM and Module are procedure regulated for irrigation facilities development by MOA.

V. Schedule

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|-----------------|------|------|------|------|------|------|------|------|------|------|------|
| 1 | Establishment of institution for irrigation facilities construction | 2003.4 | | □ | | | | | | | | | |
| 2 | Consensus in GYT | 2003.4 | | □ | | | | | | | | | |
| 3 | Official request (IRRIFORM.01) for implementation | 2003.4 | | □ | | | | | | | | | |
| 4 | Preliminary Investigations (Module 1) | 2003.5 | | □ | | | | | | | | | |
| 5 | Consensus in DYT | 2003.5 | | □ | | | | | | | | | |
| 6 | Budget allocation for Multi-disciplinary Feasibility Study (Module 2) | 2003.6 | | □ | | | | | | | | | |
| 7 | Multi-disciplinary Feasibility Study (Module 2) | 2003.7 - 2004.5 | | □ | | | | | | | | | |
| 8 | Environmental study | 2004.5 | | | □ | | | | | | | | |
| 9 | Budget allocation for construction | 2004.5 | | | □ | | | | | | | | |
| 10 | Pre-construction Meeting 1 (Module 3) | 2004.6 | | | □ | | | | | | | | |
| 11 | Pre-construction Meeting 2 (Module 4) | 2004.6 | | | □ | | | | | | | | |

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|--|-----------------|------|------|------|------|------|------|------|------|------|------|------|
| 12 | Land acquisition | 2004.4 - 2007.6 | | | [] | | | | | | | | |
| 13 | Procurement of materials and tools | 2004.4 - 2004.6 | | [] | | | | | | | | | |
| 14 | Overall management of construction | 2004.7 - 2007.6 | | | [] | | | | | | | | |
| 15 | Arrangement of unskilled labor | 2004.7 - 2007.6 | | | [] | | | | | | | | |
| 16 | Development of WUA constitution and bylaws (Module 5) | 2004.7 | | [] | | | | | | | | | |
| 17 | Banking and bookkeeping training (Module 6) | 2004.7 | | [] | | | | | | | | | |
| 18 | Scheme management training (Module 7) | 2007.6 | | | | | | [] | | | | | |
| 19 | Completion and Handing over | 2007.6 | | | | | | [] | | | | | |
| 20 | Reserving fund for maintenance works | 2007.1 - | | | | | | | [] | | | | |
| 21 | Routine maintenance | 2007.7 - | | | | | | | [] | | | | |
| 22 | Periodical maintenance | 2008.7 - | | | | | | | [] | [] | [] | [] | [] |
| 23 | Periodical repair works | 2012.6 - | | | | | | | | | | | [] |
| 24 | Establishment period inspection visit (Module 8) | 2007.11 - | | | | | | [] | [] | [] | [] | [] | |
| 25 | Dzongkhag water users' association conference (Module 9) | 2008.1 - | | | | | | [] | [] | [] | [] | [] | |

VI. Implementation and Monitoring System

| Action | Plan | |
|---|-------|---|
| Progress Management of A/P | WHO | DE/DAO, Mongar Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Mongar Dzongkhag Engineering/Agriculture Office |
| | HOW | Monthly Report prepared by Site Engineer of Dzongkhag |
| Budget Management at Preparatory Stage | WHO | Superintending Engineer, DRDS, MOA |
| | WHEN | Every Financial Year |
| | WHERE | MOA Office, Thimphu |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at Implementation Stage | WHO | DAO, Mongar Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Mongar Dzongkhag Agriculture Office |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at O&M Stage | WHO | Chairperson, WUA |
| | WHEN | Monthly basis |
| | WHERE | Accountant, WUA |

| | | |
|-----------------|-------|--|
| | HOW | Constitution/Bylaws enacted in WUA |
| 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/ Agriculture Office, Dzongkhag at implementation stage/ WUA Office 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 Office discusses with the beneficiaries. Accident, Participation, Dispute: WUA Office discusses among the beneficiaries and third party. Manpower: DRDS, MOA discusses with the organization concerned. |

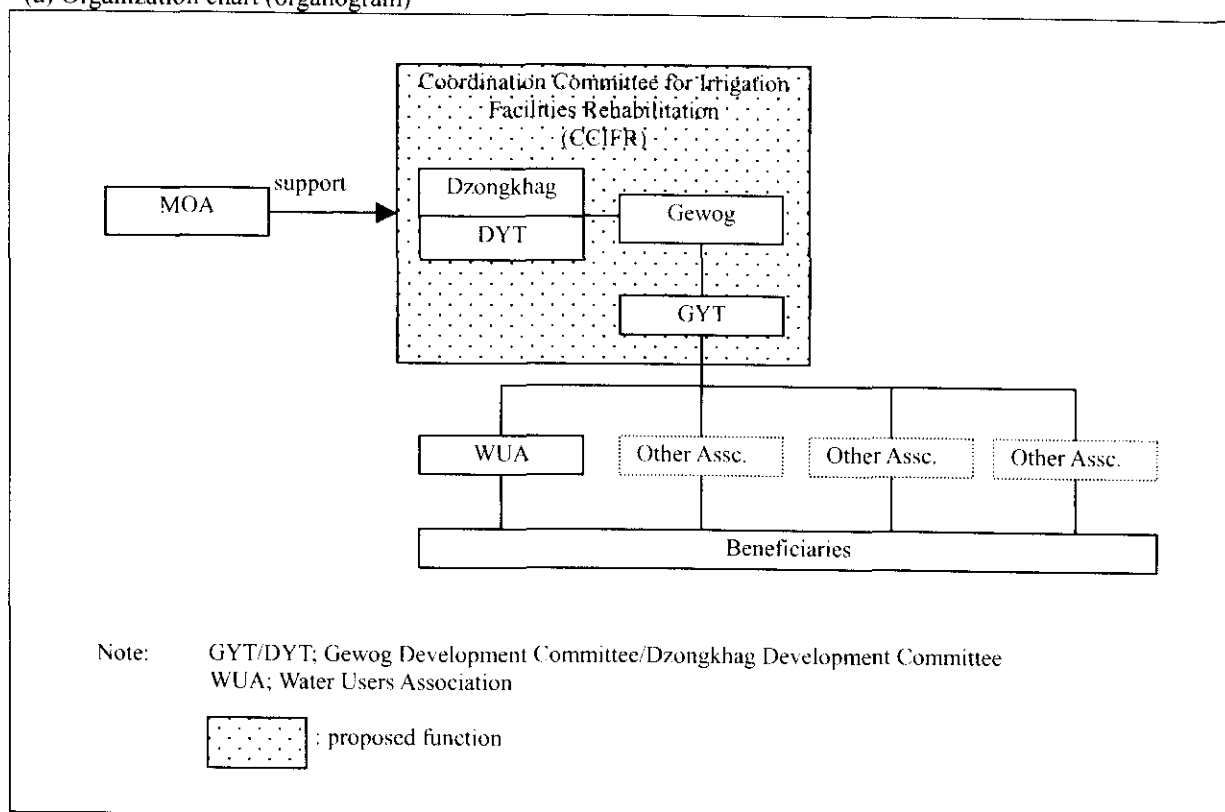
1.3.1 Drepong Scheme (Rehabilitation)

| | | | |
|-------------------|---|---------------------|--|
| I. General | | Sheet No. | AP-14 |
| Program | Program for Food Crop Production Increase / Drepong / Mongar | | |
| Sub-program | Irrigation Development Sub Program (Rehabilitation, Drepong) | | |
| Stakeholders | Level | Organization / Name | Contact Person |
| | National | MOA | Mr. Kaylzang Tshering (SE. DRDS, 02-322228) |
| | Dzongkhag | Mongar | Mr. Penden Norgey (DE, 04-641206) Mr. Tandin Dorji (DAO, 04-641181) |
| | Gewog | GYT | Mr. Pema Tshewang(Gup) |
| | Beneficiaries | WUA (60HH) | Mr. (Chairman) |

| | |
|-------------------------------------|---|
| II. Program/Sub-program | |
| Target | To increase food crop production, length of canal to be rehabilitated=1.3 km |
| Activities | <ul style="list-style-type: none"> • Survey, Plan and Cost estimation • Rehabilitation of irrigation facilities • Maintenance by Water Users Association • Procurement of construction materials and tools • Financial arrangement |
| Input | <ul style="list-style-type: none"> • Surveyor (Dzongkhag) • Irrigation Engineer for Rehabilitation Plan (Dzongkhag) • Irrigation Engineer for Supervision (Dzongkhag) • Construction Materials (DRDS, MOA) • Skilled Labor (Mason, Carpenter etc.) • Unskilled Labor (WUA) • Project Cost Nu. 0.172 mil. • Maintenance by Water Users Association |
| Output | The existing irrigation facilities are rehabilitated to attain the food crop production increase. (Irrigated area=16.4ha) |
| Period (Tentative) | <ul style="list-style-type: none"> • Survey and Plan 2003.1~2003.6 • Rehabilitation 2003.7~2006.6 • Maintenance 2006.7~ |
| Related Program / Sub-program (How) | <ul style="list-style-type: none"> • Program for Food Crop Production Increase/Food Security SP, Paddy-rice Production SP, Post-harvest Technology Training SP(They will be executed together with Irrigation Development SP) • Extension Strengthening Program/Extension Strengthening for Food Crop SP(Extension will be executed to the beneficiaries of rehabilitated irrigation facilities) |
| Project Justification | <ul style="list-style-type: none"> • Environment: IEE was conducted in the Master Plan. As this is actually rehabilitation of irrigation facilities, it will be enough to assess by only the routine environmental checking by NEC to be executed before the commencement of rehabilitation and an authorization issuance of NEC will be applied by Dzongkhag. • Efficiency: Reasonable range of rehabilitation cost of canal per km is about 132,000 Nu estimated in 9th FYP in the maximum limitation. • Consistency with upper plan/program: This is based on the program of MOA. • Sustainability: The participation of beneficiaries, maintenance fund contribution and so on should be confirmed on the basis of the national irrigation policy procedural manual prepared by MOA. |

III. Implementing Organization

(a) Organization chart (organogram)



(b) General Role and Responsibility of Stakeholders

| Stakeholder | | General Role and Responsibility |
|---------------|---|---|
| National | DRDS, MOA | Responsible for the program comprehensively in terms of finance, technical backstopping and coordination with other stakeholders. |
| Dzungkhag | Engineering Office/ Agriculture Office | Actually supervises WUA from rehabilitation and maintenance by WUA including accounting of the program. |
| Gewog | GYT | Formulate the Gewog rehabilitation plan and evaluate the program in the plan, and based on this, made the official request letter and submit it to Dzungkhag. |
| Beneficiaries | WUA | Directly engages in the program and participate the rehabilitation and maintenance from at the inspection of facilities as unskilled labor free of charge. |

IV. Action Plan (sequent)

| | Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|---|---|-------------------------------|---|
| 1 | Consensus in GYT | GYT | The request of irrigation facilities rehabilitation from WUA will be discussed in GYT and with the consensus will be proceeded to Dzungkhag. |
| 2 | Official request (IRRIFORM.01) for rehabilitation | GYT | The GYT member will prepare a request letter and the letter with the signature of Gup will be officially submitted to Dzungkhag with necessary information for evaluation (required works, contribution by Gewogs or beneficiaries, etc.) |
| 3 | Inspection of facilities to be rehabilitated | Dzungkhag/ WUA | The inspection will be executed to find out whether the proposed request meets the basic requirements for government assistance. The rehabilitation identification report will be made for further procedure referring to Module 1. |
| 4 | Consensus in DYT | Dzungkhag / DYT | The request will be discussed based on the rehabilitation identification report, and with the consensus and Dzungda's approval will be proceeded to MOA and MOF for further procedure for budget allocation. |
| 5 | Budget allocation for | Dzungkhag | The budget for rehabilitation survey will be arranged in MOF after |

| Required Action (WHAT) | Responsible Stakeholder (WHO) | Detailed Activities (HOW) |
|--|-------------------------------|--|
| rehabilitation survey | | scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 6 Survey and plan for rehabilitation | Dzongkhag | Rehabilitation survey will be executed to determine whether the proposed request is reasonable and necessary or not. The rehabilitation survey report with a detailed rehabilitation plan, countermeasures for the problems and estimation of the rehabilitation cost will be made referring to Module 2. |
| 7 Budget allocation for rehabilitation | Dzongkhag | The budget for rehabilitation of irrigation facilities will be arranged in MOF after scrutinizing the request from Dzongkhag by MOA and distributed to Dzongkhag directly. |
| 8 Procurement of materials and tools | Dzongkhag | Supplying materials and tools including technical backstopping from Dzongkhag for rehabilitation of irrigation facilities will be arranged based on the requisition of Dzongkhag in Implementation. |
| 9 Overall management of rehabilitation | Dzongkhag | The rehabilitation of irrigation facilities will be carried out under the management of Dzongkhag in Implementation. |
| 10 Arrangement of unskilled labor | WUA | WUA shall provide free unskilled labor in accordance with the arrangement of the site in-charge. |
| 11 Reserving fund for maintenance works | WUA | For the following maintenance, the fund will be reserved in the system of WUA as same as the proposed irrigation scheme. |
| 12 Routine maintenance | WUA | Routine maintenance like canal cleaning, weeding will be periodically and timely carried out under the guidance of the site in-charge after rehabilitation. |
| 13 Periodical maintenance | WUA | Annual maintenance for natural calamity and unexpected disasters will be periodically carried out under the guidance of the site in-charge after rehabilitation. |
| 14 Periodical repair works | MOA/ WUA | Major repair will be executed using construction machinery to be arranged by CMU/MOA and Dzongkhag every five year after rehabilitation, if necessary. |
| 15 Establishment period inspection visit | Dzongkhag | Inspection and evaluation of the irrigation system will be executed each year during the establishment period (in five years after the rehabilitation) to monitor and evaluate the condition of the irrigation system, functioning WUA, crop productivity and assess the need for further Dzongkhag support in accordance with Module 8. |
| 16 Dzongkhag water users' association conference | Dzongkhag | This provides a forum where representatives of different WUAs can present and discuss progress, programs and problems. each year during the establishment period(in five years after the rehabilitation) During the conference measures to overcome certain problems facing the WUAs can be framed jointly by the concerned WUA and the Dzongkhag irrigation sector in accordance with Module 9. |

Note: FORM and Module are procedure regulated for irrigation facilities development by MOA, the irrigation facilities rehabilitation program will follow this procedure as well.

V. Schedule

| Required Action (WHAT) | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|--------|------|------|------|------|------|------|------|------|------|------|------|
| 1 Consensus in GYT | 2003.1 | | | | | | | | | | | |
| 2 Official request (IRRIFORM.01) for rehabilitation | 2003.1 | | | | | | | | | | | |
| 3 Inspection of facilities to be rehabilitated | 2003.2 | | | | | | | | | | | |

| Required Action (WHAT) | | Period | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|---|-------------------|------|------|------|------|------|------|------|------|------|------|------|
| 4 | Consensus in DYT | 2003.2 | | □ | | | | | | | | | |
| 5 | Budget allocation for rehabilitation survey | 2003.3 | | □ | | | | | | | | | |
| 6 | Survey and plan estimation for rehabilitation | 2003.3 - 2003.5 | | □ | | | | | | | | | |
| 7 | Budget allocation for rehabilitation | 2003.5 | | □ | | | | | | | | | |
| 8 | Procurement of materials and tools | 2003.5 - 2003.6 | | □ | | | | | | | | | |
| 9 | Overall management of rehabilitation | 2003.7 - 2006.6 | | □ | | | | | | | | | |
| 10 | Arrangement of unskilled labor | 2003.7 - 2006.6 | | □ | | | | | | | | | |
| 11 | Reserving fund for maintenance works | 2006.1 - | | | | | □ | | | | | | |
| 12 | Routine maintenance | 2006.7 - | | | | | □ | | | | | | |
| 13 | Periodical maintenance | 2007.7 - | | | | | | □ | □ | □ | □ | □ | □ |
| 14 | Periodical repair works | 2011.6 - | | | | | | | | | | | □ |
| 15 | Establishment period inspection visit | 2006.11 - 2010.11 | | | | | | □ | □ | □ | □ | □ | |
| 16 | Dzongkhag water users' association conference | 2007.1 - | | | | | | □ | □ | □ | □ | □ | □ |

VI. Implementation and Monitoring System

| Action | Plan | |
|---|-------|--|
| Progress Management of A/P | WHO | DE/DAO, Mongar Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Mongar Dzongkhag Engineering/Agriculture Office |
| | HOW | Monthly Report prepared by Site Engineer of Dzongkhag |
| Budget Management at Preparatory Stage | WHO | Superintending Engineer, DRDS, MOA |
| | WHEN | Every Financial Year |
| | WHERE | MOA Office, Thimphu |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at Implementation Stage | WHO | DAO, Mongar Dzongkhag |
| | WHEN | Monthly basis |
| | WHERE | Mongar Dzongkhag Agriculture Office |
| | HOW | As per Financial Manual of Royal Government of Bhutan |
| Budget Management at O&M Stage | WHO | Chairperson, WUA |
| | WHEN | Monthly basis |
| | WHERE | Accountant, WUA |
| | HOW | Constitution/Bylaws enacted in WUA |
| 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/ Agriculture Office, Dzongkhag at implementation stage/ WUA Office 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 Office discusses with the beneficiaries. Accident, Participation, Dispute: WUA Office discusses among the beneficiaries and third party. Manpower: DRDS, MOA discusses with the organization concerned. |