

Preliminary Environmental Survey

Joint Scoping

For

The Environmental Impact Assessment

On

The Lower Munyati River Basin Agricultural Development Project
in the Republic of Zimbabwe

By

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Introduction

A project has been proposed for irrigation agriculture to develop the lower Munyati River basin west of Kadoma. It involves the construction of a dam, named Kudu dam, with a reservoir total storage capacity of 1,551 MCM. It is one of the biggest dams of this country, was designed by the government of Zimbabwe in 1992. The aims at mainly servicing small holder farmers. JICA is scheduled to conduct its feasibility study late this year.

This is a part of Preliminary Environmental Survey, i.e. screening and scoping, for the Environmental Impact Assessment (EIA) on the proposed development project. The project will extensively disturb a natural tract of lands and the ecology of the area covered will be severely damaged. For example the dam construction will submerge 7,800 ha of area, destroying the ecosystem of the valley and forcing approximately 1,000 households to resettle. This survey identifies important environmental issues to facilitate the coming the coming EIA. The past experience implies that community participation is vital for the success of the project.

1 Project description

(1) Study Title (Project Name)

The Lower Munyati River Basin Agricultural Development Project in the Republic of Zimbabwe

(2) Background Information and Objectives of Project

Its major objective is the regional development by assisting the small holder farmers especially in the communal and resettlement lands in the project area, and further to develop and promote the regional economy through self-support of them. Zimbabwean government put its priority to the communal and resettlement lands, the small scale commercial farms and then the large scale commercial farms in order for allocation of Kudu Dam water.

(3) Brief Description of Project

Outline of Project Area : Savanna woodland area located in the west of Kadoma town in Mashonaland West Province

Beneficiaries & Benefited area : 88,200 persons & 14,700 ha

Major Project Components : Dam, canals, irrigation, land leveling resettlement and change in farming system

Executing Agencies : AGRITEX, Ministry of Lands and Agriculture

Environmental Agencies Concerned: Ministry of Mines Environment and Tourism; Africa 2000, ENDA, ZERO, World Vision, and others.

(3) Major Components and Development Scale of Project

(1) Main Project Components (Development activity)		Type of Project		(3) Scale of Project		(4) Remarks
		New Project	Rehabilitation	Quantity	Dimensions of major facilities	EIA required
a	Irrigation	x		14,700 ha		EIA required
b	Drainage	x		unknown		EIA required
c	Land cleaning & leveling	x		unknown		EIA required
d	Swamp reclamation					
e	Land consolidation	x	x	unknown		EIA required
f	New land settlement	x		over 9,227 households		EIA required
g	Dam and reservoir	x		dam 1 reservoir 1 reservoir area: 7,800 ha	storage capacity: 1,551 MCM	EIA required
h	Substantial changes in farming system	x				EIA required
i	Other					

2 Site Description

2.1 Study Title (Project Name)

Feasibility Study on the Lower Munyati River Basin Agricultural Development Project in the Republic of Zimbabwe

2.2 Present Socio-economic Status of Project Area

- | | | |
|-----|--|--|
| (1) | Land ownership and land use, etc. | Communal, Resettlement and Small Scale Commercial. They have use rights, permits and leases. |
| (2) | Economic activities in and around the project area | Cotton, maize, groundnuts, and sunflower cultivation; and illegal gold panning. |
| (3) | Customs (riparian rights, water rights, etc. | There is a new bill for public participation which will affect whatever rights they are. |
| (4) | Host people or community | Permanent who derive their livelihood from farming |
| (5) | Public health conditions | In the vicinity there is malaria prevalence. |
| (6) | Population | (To be obtained from Central Statistical Office) |
| (7) | Other | |

2.3 Natural Conditions of Project Area

- | | | |
|-----|-----------------------------------|--|
| (1) | Climate | Mean annual temperatures 26.6°C and annual rainfall 730 mm |
| (2) | Topography | Altitude of between 800-1,000m, Munyati river flows from south to north through the Project area. The right bank has a gentle slope and a plateau on the left. |
| (3) | Hydrology and drainage conditions | Main surface water sources are Munyati Sebakwe and Umsweswe rivers which drain through the basin to Lake Kariba |
| (4) | Soils | Mostly moderately shallow to deep fersiallitic soils and others are Lithosol Vertisol and Siallitic. |
| (5) | Vegetation | Savanna woodlands |
| (6) | Rare species or fragile ecology | Unknown |
| (7) | Other | |

2.4 Environmentally Sensitive Areas in Project Site or Vicinity

Environmentally sensitive Area	Applicable or Not					
	In Project Area			Vicinity of Project Area		
	Appl.	N.A.	Unknown	Appl.	N.A.	Unknown
Area under specific designation						
1 Habitat of fauna and flora listed in CITES			x			x
2 Wetland designated under the Ramsar Convention		x			x	
3 Heritage sites listed in the World Heritage Convention			x			x
4 National Parks, nature reserves, etc.			x	x		
5 Other()						
Socio-economically sensitive areas						
6 Areas inhabited by indigenous peoples, ethnic minorities, nomads, etc.		x		x		
7 Historical remains, cultural assets, aesthetic sites	x					x
8 Areas likely to suffer from significant negative economic impact	x					x
9 Other ()						
Environmentally sensitive areas						
10 Arid and semi-arid lands (including savanna, rangeland, etc.)	x			x		
11 Tropical rainforest and wildlands		x				x
12 Wetlands	x			x		
13 Mountainous, steep-sloped, erodible or devastated lands	x				x	
14 Closed water bodies such as lakes, swamps or reservoirs	x				x	
15 Other ()						

CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora

2.5 Other Information

- (1) Habitat of fauna and flora: Information can be obtained from Department of Natural Parks and wildlife
- (2) Ramsar Convention: Zimbabwe is now considering to be a member.
- (3) Heritage Sites: Information can be obtained from the Department of Museum and National Monuments.
- (4) National park: Ganyungu Forest in the Project area and Mufungabusi Forest Land in the vicinity. Further information can be obtained from the Forestry Commission.
- (5) The ethnic minorities are those in Large Scale Commercial Area.
- (6) There is a cave at the upstream of the proposed dam. There are also graves for each household.

3 Important environmental issues

The project involves construction of dam and canals on the Munyati river basin. This will result in submerging approximately 7,800 ha of the river valley on its upstream. Downstream it will change its hydrology and destroy the natural vegetation.

3.1 Social environment

(1) socio-economic issues

Social issues

Resettlement, planned or involuntary, will be caused by the resultant submerging. Land will be consolidated downstream for resettlement. The irrigation agriculture to be introduced will be intensive. It will bring in changes in way of life and conflicts among peoples and communities. This irrigation system will require community participation for its successful maintenance and upgrading. It is clear that the communities need to play a vital role for its development.

Customarily, most farm labor comes from women, but farm income is mostly controlled by men. This should not be overlooked. The cotton growing area, such as in this case, favors polygamy for the supply of labor. Moreover, after cotton harvest, the suicidal incidents of women increase as men go to bars for pleasure. In land allocation the wives require independent pieces of lands.

Demographic issues

One may think that there may be no population increase or change in composition because basically the same people will be moved, planed or forced. However, more intensified farming with more economic activities will attract more people. There will also be dam construction workers. The change in economic status and attitudes will favor modern life which may affect the population and its composition.

Economic activities

Irrigation agriculture and improved infrastructure diversify economic activities, while a school and shops will be submerged and illegal gold panning interrupted. The present economic disparities will affect the farmers' success in irrigation farming which requires more investment. These may continue and encourage the illegal gold panning to continue. This situation requires further analysis.

Institutional and custom related issues

The dammed water is a resource not only for irrigation, but industries and cities. The wise use of this common resource requires an efficient management committee.

The use of water will also be affected by the new bill for public participation. Water is a commodity to be paid for its use. The farmers need to pay for irrigation water.

(2) Health and sanitary issues

The damming and canalling will create stagnant water resulting in the prevalence of malaria and belharzia, etc. More agro-chemicals will be applied for this irrigation agriculture causing health hazard. The increased population will also bring in more waste. Mercury used in gold panning is a source of health concerned. The prevention of these occurrences needs to be considered.

(3) Cultural asset

A number of activities, damming, land clearing and leveling, resettlement, etc., will negatively affect the cultural assets. Traditional customs may also be disrupted in this process. Submerging graves require respectful consultation of people concerned. Communal use of labor, "nhimbe", a tradition in this area, can be considered to be an asset.

3.2 Natural environment

(1) Biological and ecological issues

A natural tract of land will be submerged by damming the Munyati river. This submersion of the valley, wetland, riverine, etc., will destroy an ecosystem with biological diversity, unique in this dry area. This may also affect the ecology of the adjacent area. Downstream, land will be cleared, leveled and consolidated. Two main canals, totaling approximately 130 km will be constructed on both sides of the river. This will result in destroying the natural woodlands.

Irrigation agriculture will be introduced, population possibly increased and use of agro-chemicals intensified. Overgrazing may result in the surrounding area because of the proximity of unused woodlands (Chimbira et al., 1998)

This activity will disturb the indigenous fauna and flora of this area and proliferate exotic or hazardous species. The disturbance may extend to Lake Kariba where the river flows in.

(2) Soils and land resources

Soil resources

It is clear that the proposed activities which include damming, canling, land clearing and leveling (deforestation) and irrigation farming, result in soil erosion (water and wind), salinization, soil degradation, and soil contamination by agro-chemicals.

Land resources

Land resources will be devastated by the proposed submersion. It possibly causes land slides of the riverbanks which may be loosened by the impoundment. Similarly, land clearing and leveling, deforestation and over-grazing will degrade a large extent of lands at various degrees.

(3) Hydrology, air and water quality

Hydrology

The proposed dam enpounds the surface water of Munyati river and may affect its flow of groundwater. It will also accelerate sedimentation. Land clearing and leveling, and canalling will change the surface water hydrology. The ongoing illegal gold panning will degrade the riverbed.

Water quality and temperature

The various activities, directly or indirectly, will cause deforestation, soil erosion and degradation, agro-chemical contamination, etc. These will affect the water quality.

Atmosphere

The agro-chemicals will be the source of air pollution. Similarly, dust created by the assorted physical activities such as dam construction and land clearing is another source.

(4) Landscape and mining resources.

Landscape is damaged by the dam and canal constructions. The damming also affects the illegal gold panning.

4 Conclusions and recommendations

Social Environment

- (1) Community participation is vital in all stages of the project for its success.
- (2) Land should be allocated based on the need of the community, considering the uniqueness of this area.
- (3) The population and its composition may possibly change during and after the project implementation.
- (4) Economic activities will be diversified. The illegal gold panning may be affected.
- (5) The impounded water is a commodity which farmers have to wisely utilize and manage.
- (6) Health and sanitation will deteriorate by the possible prevalence of malaria and belharzia, agro-chemicals, human waste, etc.
- (7) Communal use of labor, "nhimbe", a tradition in this area can be considered as a cultural asset.

Natural environment

- (8) The project severely affects the ecology of the area. A comprehensive study is needed.
- (9) Various parts of the land resources will be devastated by the project. A careful planning is required to mitigate the damages.
- (10) The hydrology will be altered by the impoundment and the canal construction.
- (11) The water quality will be affected by the project activities.

Reference

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Appendix 1 Checklist for Joint Screening

- 1 **Study Title (Project Name):** Feasibility Study on the Lower Munyati River Basin Agricultural Development Project in the Republic of Zimbabwe
- 2 **Name of Country** : The Republic of Zimbabwe
- 3 **Criteria for Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) in Recipient Country**
 - (1) According to the 1997 EIA Policy, Page 11 on the prescribed activities there is no threshold (e.g. ha or storage capacity).
 - (2) Once an activity falls under the prescribed activity it needs to satisfy the screening guidelines on page 12 for it to be exempted from further compliance with the EIA Policy.
- 4 **Area under Specific Designation**

Environmentally sensitive Area	Applicable or Not In Project Area			Vicinity of Project Area		
	Appl.	NA	Unknown	Appl.	N.A.	Unknown
Area under specific designation						
a Habitat of fauna and flora listed in CITES			x			x
b Wetland designated under the Ramsar Convention		x			x	
c Heritage sites listed in the World Heritage Convention			x			x
d National Parks, nature reserves, etc.			x	x		
e Other ()						

5 Checklist for joint Screening

Environmental Issues	Potentially Significant Env. Impact	Evl	Evaluation Bases
I Social Environment			
1 Socio-economic Issues Will the Project significantly affect socio-economic activities in and around the Project site, such as daily human life, economic activities, transportation, community, institution, and customary practices?	1 Planned residential settlement	yes	Submersion of lands by the reservoir
	2 Involuntary resettlement	yes	Submersion by the reservoir
	3 Substantial changes in way of life	yes	Resettlement
	4 Conflict among communities or peoples	yes	Land allocation, change in life-style
	5 Impacts on native peoples	no	
	6 Population increase	yes	Intensified cropping, more economic activity
	7 Drastic change in population composition	yes	Influx of construction workers
	8 Change in bases of economic activities	yes	Illegal gold panning
	9 Occupational change and loss of job opportunity	yes	Illegal gold panning, submerging shops, poor adjustment to irrigation farming
	10 Increase in income disparities	yes	Intensified farming (poor resources)
	11 Adjustment and regulation of water or fishing (riparian) rights	yes	Water for irrigation, industry and cities, a new bill for public participation
	12 Changes in social and institutional structures	yes	Irrigation management, common resources management
	13 Changes in existing institutions and customs	no	
2 Health and Sanitary Issues Will the Project significantly affect hygiene in and around the Project area or induce water-related diseases?	1 Increased use of agro-chemicals	yes	More cotton cultivation
	2 Outbreak of endemic diseases	yes	More stagnant water expected
	3 Spreading of epidemic diseases	yes	malaria and bilharzia
	4 Residual toxicity of agro-chemicals	yes	More use of agro-chemicals
	5 Increase in domestic and other human wastes	yes	Increased population, more agricultural activities
3 Cultural Asset Issues Are any historically, culturally, aesthetically or scientifically important sites located in the Project area?	1 Impairment of historic remains and cultural assets	yes	Submerging graves
	2 Damage to theoretic aesthetic	yes	Damming and land leveling
II Natural Environment			
4 Biological and Ecological Issues Are any habitats for rare species or ecologically sensitive areas located in the Project or surrounding areas?	1 Deterioration or degradation of vegetation	yes	Damming, land leveling
	2 Negative impact on important or indigenous fauna and flora (extinction of or decrease in species)	yes	Damming, land clearing and leveling, use of agro-chemicals
	3 Degradation of ecosystems with biological diversity	yes	Riverine destruction, land clearing
	4 Proliferation of exotic, hazardous species	yes	Intensified farming (water weeds)
	5 Destruction of wetlands and peatlands	unk	
	6 Encroachment into tropical rain forests and wildlands	yes	Submerging riverine, land clearing
	7 Destruction or degradation of mangrove forests and wildlands	yes	Submerging riverine, land clearing
	8 Degradation of coral reefs	no	
5 Soil and Land Resources Will the Project significantly induce land devastation, soil erosion, soil contamination, etc?	1 Soil erosion	yes	deforestation and intensive cultivation
	2 Soil salinization	yes	Irrigation on dry lands
	3 Degradation of soil fertility	yes	Soil erosion and intensive cropping
	4 Soil contamination by agro-chemicals and others	yes	Irrigation farming, use of agro-chemicals
	5 Devastation or desertification of land	yes	Damming, land clearing and leveling, reservoir land slides
	6 Devastation of hinterland	yes	Submersion and land slide by damming and deforestation for irrigable lands
	7 Ground subsidence	unk	
6 Hydrology and Air and Water Quality Will the Project significantly affect hydrological regime of river, lake and swamp, groundwater hydrology, and air or water quality?	1 Changes in surface water hydrology	yes	Dam and canal construction
	2 Changes in groundwater hydrology	yes	Damming and land leveling
	3 Inundation and flooding	yes	Damming
	4 Sedimentation	yes	Damming
	5 Riverbed degradation	yes	Damming, gold panning
	6 Impediment of inland navigation	no	
	7 Water contamination and deterioration of water quality	yes	Increased erosion and uses of agro-chemicals
	8 Water eutrophication	yes	Increased used of agro-chemicals
	9 Salt water intrusion	no	
	10 Change in temperature of water	yes	Creation of reservoir
	11 Water pollution	yes	Increased use of agro-chemicals
7 Landscape and Mining resources Will the Project significantly affect landscape or mining resources?	1 Damage to landscape	yes	Damming, land leveling and canaling
	2 Impediment of mining resources exploitation	yes	Damming
Overall Evaluation	Many significant environmental impacts will be induced by the Project.		EIA is required for the relevant potential impacts

Appendix 2 CHECKLIST FOR INITIAL SCOPING (1/2)

1 Study Title (Project Name): Lower munyati river basin agricultural development project

I Social environment

Category of Environmental Impact /1	Initial Evaluation 2/										Remarks
	Main Project Components 3/										
	Irrigat'n		Dg	LL	SR	LC	NS	DR	FS	Ot	
	NP	Rh									

1 Socio-economic Issues

(1) Social Issues

1 Planed residential settlement	A		B	A		A	A	A	B		
2 Involuntary resettlement	A		B	A		A	A	A	B		
3 Substantial changes in way of life	A		B	A		A	A	A	B		
4 Conflict among communities and peoples	A		B	A		A	A	A	A		
5 Impact on native peoples	C		C	C		C	C	C	C		
6 Other											

(2) Demographic issues

1 Population increase	A		B	B		B	A	B	B		
2 Drastic change in population composition	B		B	B		B	B	B	B		
3 Other											

(3) Economic Activities

1 Changes in bases of economic activities	A		B	B		B	A	A	B		
2 Occupational change and loss of job opportunity	A		B	B		B	A	A	B		
3 Increase in income disparities	A		B	B		B	A	A	B		
4 Other											

(4) Institutional and Custom related Issues

1 Adjustment and regulation of water or fishing (riparian) rights	B		B	B		B	B	A	B		
2 Changes in social and institutional structures	A		B	B		B	A	A	B		
3 Changes in existing institutions and customs	A		B	B		B	A	A	B		
4 Other											

2 Health and Sanitary Issues

1 Increased use of agro-chemicals	A		B	B		B	B	A	A		
2 Outbreak of endemic diseases	A		B	B		B	B	A	B		
3 Spreading of epidemic diseases	A		B	B		B	B	A	B		
4 Residual toxicity of agro-chemicals	A		B	B		B	B	C	B		
5 Increase in domestic and other human wastes	A		B	B		B	B	A	B		
6 Others											

3 Cultural Asset Issues

1 Impairment of historic remains and cultural assets	A		B	B		B	A	A	B		
2 Damage to aesthetic sites	A		B	B		B	A	A	B		
3 Other											

1/ Definition of each category of environmental impact is presented in Appendix A, "Significant Environmental Impacts and issues"

2/ Each applicable item is marked with the following classifications:

A: As Significant Environmental Impact (SEI) is identified or expected, further scrutiny is required.

B: Since SEI is not fully clarified through the preliminary evaluation, further scrutiny is required.

C: As SEI is recognized to be nil, no further study is required.

3/ Main project components are abbreviated hereunder:

Irrigat'n: Irrigation

Dg: Drainage

LC: Land consolidation

FS: Substantial changes in farming system

NP: New project

LL: Land clearing and leveling

NS: New land settlement

Ot: Other

Rh: Rehabilitation

SR: Sea/swamp reclamation

DR: Dam and Reservoir

CHECKLIST FOR INITIAL SCOPING (2/2)

II Natural environment

Category of Environmental Impact /1	Initial Evaluation 2/											Remarks
	Main Project Components 3/											
	Irrigat'n		Dg	LL	SR	LC	NS	DR	FS	Ot		
	NP	Rh										

4 Biological and Ecological Issues

1 Changes in vegetation	A		B	B		A	A	A	B		
2 Negative impacts on important or indigenous fauna and flora	A		B	B		A	A	A	B		
3 Degradation of ecosystems with biological diversity	A		B	B		A	A	A	B		
4 Proliferation of exotic and/or hazardous species	A		B	B		B	A	A	B		
5 Destruction of wetlands and peatlands	A		B	B		B	B	B	B		
6 Encroachment into tropical rain Forests and wildlands	A		B	B		B	B	A	B		
7 Destruction or degradation of mangrove forests	C		C	C		C	C	C	C		
8 Degradation of coral reefs	C		C	C		C	C	C	C		
9 Other											

5 Soil and Land Resources

(1) Soil Resources

1 Soil erosion	A		B	B		B	B	A	B		
2 Soil salinization	A		B	B		B	B	C	B		
3 Degradation of soil fertility	B		B	B		B	B	C	B		
4 Contamination by agro-chemicals and others	A		B	B		B	B	B	B		
5 Other											

(2) Land Resources

1 Devastation or desertification of land	B		B	B		B	B	A	B		
2 Devastation of hinterland	A		B	B		B	B	A	B		
3 Ground subsidence	B		C	C		C	C	C	C		
4 Other											

6 Hydrology and Air and Water Quality

(1) Hydrology

1 Changes in surface water hydrology	A		A	B		B	B	A	C		
2 Changes in ground water hydrology	A		B	B		B	B	B	C		
3 Inundation and flooding	A		B	B		B	B	A	B		
4 Sedimentation	A		B	B		B	B	A	C		
5 Riverbed degradation	B		B	B		B	B	B	C		
6 Impediment of inland navigation	C		C	C		C	C	C	C		
7 Other											

(2) Water Quality and Temperature

1 Water contamination and deterioration of Water quality	A		B	B		B	B	A	B		
2 Water eutrophication	A		B	B		B	B	B	B		
3 Salt water intrusion	C		C	C		C	C	C	C		
4 Change in temperature of water	B		B	B		C	C	A	C		
5 Other											

(3) Atmosphere

1 Air pollution	B		C	C		C	B	C	B		
2 Other											

7 Landscape and Mining Resources

1 Damage to landscape	A		B	B		B	A	A	B		
2 Impediment of mining resources exploitation	A		C	C		B	A	A	B		

1/ Definition of each category of environmental impact is presented in Appendix A, "Significant Environmental Impacts and issues"

2/ Each applicable item is marked with the following classifications:

- A: As Significant Environmental Impact (SEI) is identified or expected, further scrutiny is required.
- B: Since SEI is not fully clarified through the preliminary evaluation, further scrutiny is required.
- C: As SEI is recognized to be nil, no further study is required.

3/ Main project components are abbreviated hereunder:

- Irrigat'n: Irrigation
- Dg: Drainage
- LC: Land consolidation
- FS: Substantial changes in farming system
- NP: New project
- LL: Land clearing and leveling
- NS: New land settlement
- Ot: Other
- Rh: Rehabilitation
- SR: Sea/swamp reclamation
- DR: Dam and Reservoir

Appendix 3 CHECKLIST FOR JOINT SCOPING (1/2)

- (1) Applicable development activities:
Irrigation Drainage; Land clearing and leveling; Sea/swamp reclamation; Land consolidation; Dam and reservoir, or Substantial change in farming system
- (2) Applicable development type:
New project or Rehabilitation
- (3) Applicable environmentally sensitive area:
Arid and semi-arid lands; Tropical rain forest; Wildlands; Wetlands; Peat lands; Coastal zones; Mangrove forests; Coral reefs; Mountainous, steep sloped, erodible, or devastated lands; or Closed water bodies in the upstream or downstream
(Irrelevant items in the above are deleted)

I Social environment

Category of Environmental Impact	Evaluation of SEI 1/				Evaluation Base 2/
	A	B	C	D	

1 Socio-economic Issues

(1) Social Issues

1 Planned residential settlement	X				Damming, land consolidation
2 Involuntary resettlement	X				Damming, land consolidation
3 Substantial changes in way of life	X				Resettlement, change in farming system
4 Conflict among communities and peoples	X				Resettlement, land allocation
5 Impacts on native peoples			X		
6 Other					

(2) Demographic issues

1 Population increase	X				Intensified farming and economic activity
2 Drastic change in population composition		X			Influx of construction workers
3 Other					

(3) Economic Activities

1 Changes in bases of economic activities	X				Illegal gold panning,
2 Occupational change and loss of job opportunity		X			Illegal gold panning, submerging shops
3 Increase in income disparities		X			Intensified farming with poor resources
4 Other					

(4) Institutional and Custom related Issues

1 Adjustment and regulation of water or fishing (riparian) rights		X			Water for irrigation, industry, and cities, a new bill for public participation
2 Changes in social and institutional structures	X				Irrigation & common resource management
3 Changes in existing institutions and customs	X				
4 Other					

2 Health and Sanitary Issues

1 Increased use of agro-chemicals	X				Intensified farming
2 Outbreak of endemic diseases	X				Increased stagnant water expected
3 Spreading of epidemic diseases	X				Malaria and bilharzia
4 Residual toxicity of agro-chemicals	X				More use of agrochemicals
5 Increase in domestic and other human wastes	X				Increased population, more agric. activity
6 Others					

3 Cultural Asset Issues

1 Impairment of historic remains and cultural assets	X				Submerging graves
2 Damage to aesthetic sites	X				Damming, land leveling
3 Other					

1/ Applicable columns with the following impact degree are marked with "x"

- A: The subject Significant Environmental Impact (SEI) is unquestionably induced by the Project.
B: The subject SEI is likely to be induced by the Project.
C: There is no possibility of the subject SEI being induced by the Project.
D: The SEI is not fully known.

2/ Potential impact, et., are filled in referring to Appendix A, "Significant Environmental Impacts and Issues"

CHECKLIST FOR JOINT SCOPING (2/2)

- (1) Applicable development activities:
Irrigation Drainage; Land clearing and leveling; Sea/swamp reclamation; Land consolidation; Dam and reservoir, or Substantial change in farming system
- (2) Applicable development type:
New project or Rehabilitation
- (3) Applicable environmentally sensitive area:
Arid and semi-arid lands; Tropical rain forest, Wildlands; Wetlands; Peat lands; Coastal zones; Mangrove forests; Coral reefs; Mountainous, steep sloped, erodible, or devastated lands; or Closed water bodies in the upstream or downstream
(Irrelevant items in the above are deleted)

II Natural environment

Category of Environmental Impact	Evaluation of SEI 1/				Evaluation Base 2/
	A	B	C	D	

4 Biological and Ecological Issues

1 Changes in vegetation	X				Damming, land leveling & consolidation
2 Negative impacts on important or indigenous fauna and flora	X				Damming, land clearing and leveling, consolidation, resettlement, agrochemicals
3 Degradation of ecosystems with biological diversity	X				riverine destruction, land clearing
4 Proliferation of exotic and/or hazardous species	X				Intensified farming (water weeds)
5 Destruction of wetlands	X				
6 Encroachment into tropical rain Forests and wildlands	X				Submerging riverine, land clearing
7 Destruction or degradation of mangrove forests & wildlands	X				Submerging riverine, land clearing
8 Degradation of coral reefs			X		
9 Other					

5 Soil and Land Resources

(1) Soil Resources

1 Soil erosion	X				Deforestation, intensified farming
2 Soil salinization	X				Irrigation on dry lands
3 Degradation of soil fertility	X				Soil erosion and intensified farming
4 Soil contamination by agro-chemicals and others	X				Irrigation farming, use of agrochemicals
5 Other					

(2) Land Resources

1 Devastation or desertification of land	X				Dam land slides, some increased grazing
2 Devastation of hinterland	X				Damming, land clearing and leveling
3 Ground subsidence			X		
4 Other					

6 Hydrology and Air and Water Quality

(1) Hydrology

1 Changes in surface water hydrology	X				Dam and canal construction
2 Changes in ground water hydrology	X				Damming, land leveling
3 Inundation and flooding	X				Damming
4 Sedimentation	X				Damming
5 Riverbed degradation		X			Damming, gold panning
6 Impediment of inland navigation			X		
7 Other					

(2) Water Quality and Temperature

1 Water contamination and deterioration of water quality	X				Increased erosion & uses of agro-chemicals
2 Water eutrophication	X				Increased uses of agro-chemicals
3 Salt water intrusion			X		
4 Change in temperature of water		X			Damming
5 Other					

(3) Atmosphere

1 Air pollution		X			Increased uses of agro-chemicals
2 Other					

7 Landscape and Mining Resources

1 Damage to landscape	X				Damming, canalizing, land leveling
2 Impediment of mining resources exploitation		X			Damming (illegal gold panning)

1/ Applicable columns with the following impact degree are marked with "x"

- A: The subject Significant Environmental Impact (SEI) is unquestionably induced by the Project.
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- C: There is no possibility of the subject SEI being induced by the Project.
- D: The SEI is not fully known.

2/ Potential impact, et., are filled in referring to Appendix A, "Significant Environmental Impacts and Issues"

様式第 1 号 (記第 2 関係)

(収集/作成資料)

資料リスト (□収集資料/□専門家作成資料)

平成10年 4月30日作成

番号	資料の名称	形態(図書・ビデオ・地図・写真等)	収集資料	専門家作成資料	JICA作成資料	テキスト	発行機関	取扱区分	図書館記入欄
1	AGRICULTURAL PRODUCTION ON SMALL SCALE COMMERCIAL FARMS 1994						Central Statistical Office	JR・ CR() ・ SE	
2	AGRICULTURAL PRODUCTION ON RESETTLEMENT SCHEMES 1994						Central Statistical Office	JR・ CR() ・ SE	
3	AGRICULTURAL PRODUCTION ON RESETTLEMENT SCHEMES 1996						Central Statistical Office	JR・ CR() ・ SE	
4	AGRICULTURAL PRODUCTION ON SMALL SCALE COMMERCIAL FARMS 1995						Central Statistical Office	JR・ CR() ・ SE	
5	CROP PRODUCTION ON LARGE SCALE COMMERCIAL FARMS 1995						Central Statistical Office	JR・ CR() ・ SE	
6	Census of Registered Poultry Producers, Third Quarter, 1997						Central Statistical Office	JR・ CR() ・ SE	
7	Quarterly Digest of Statistics December 1997						Central Statistical Office	JR・ CR() ・ SE	
8	PRODUCTION ACCOUNT OF AGRICULTURE, FORESTRY AND FISHING 1987-1996 (Excluding Commercial Lands, Resettlement Areas and Small Scale Market Gardening)						Central Statistical Office	JR・ CR() ・ SE	
9	AGRICULTURE AND LIVESTOCK, SURVEY IN COMMUNAL LANDS 1998/94						Central Statistical Office	JR・ CR() ・ SE	
10	INCOME CONSUMPTION AND EXPENDITURE SURVEY REPORT 1990/91						Central Statistical Office	JR・ CR() ・ SE	
11	LIVESTOCK ON LARGE SCALE COMMERCIAL FARMS 1997						Central Statistical Office	JR・ CR() ・ SE	
12	CENSUS 1992 (ZIMBABWE NATIONAL REPORT)						Central Statistical Office	JR・ CR() ・ SE	
13	CENSUS 1992 (PROVINCIAL PROFILE, MIDLANDS)						Central Statistical Office	JR・ CR() ・ SE	
14	CENSUS 1992 (PROVINCIAL PROFILE MASHONALAND WEST)						Central Statistical Office	JR・ CR() ・ SE	
15	ZIMBABWE'S AGRICULTURE POLICY FRAMEWORK 1995-2020						MINISTRY OF AGRICULTURE	JR・ CR() ・ SE	

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16	Facts and Figures, 1997						Central Statistical Office	JR・ CR ()・ SE	
17	ZIMBABWE, HYDROLOGICAL ZONES Map (1:1,000,000), 1984						Government of ZIMBABWE	JR・ CR ()・ SE	
18	Vegetation Map (KWEKWE, Zimbabwe), 1:250,000, 1996						Government of ZIMBABWE	JR・ CR ()・ SE	
19	Vegetation Map (COPPER QUEEN, Zimbabwe), 1:250,000, 1996						Government of ZIMBABWE	JR・ CR ()・ SE	
20	Map, KWEKWE (SHEET SE-35-12), 1:250,000, 1990						Government of ZIMBABWE	JR・ CR ()・ SE	
21	Map, COPPER QUEEN (SHEET SE-35-8), 1:250,000, 1993						Government of ZIMBABWE	JR・ CR ()・ SE	
22	MEAN ANNUAL RAINFALL, 1:2,500,000, 1984						Government of ZIMBABWE	JR・ CR ()・ SE	
23	RELIEF MAP OF ZIMBABWE (SHEET 1), 1984						Government of ZIMBABWE	JR・ CR ()・ SE	
24	RELIEF MAP OF ZIMBABWE (SHEET 2), 1984						Government of ZIMBABWE	JR・ CR ()・ SE	
25	Environmental Impact Assessment Guidelines Vol. 1-10						Ministry of MET, ZIMBABWE	JR・ CR ()・ SE	
26	An Environmental Impact Assessment of the Gwayi-shangani dam, Water Tec(Pvt.) Ltd.1977							JR・ CR ()・ SE	
27								JR・ CR ()・ SE	
28								JR・ CR ()・ SE	
29								JR・ CR ()・ SE	
30								JR・ CR ()・ SE	