FINAL DRAFT

Environmental Assessment Report

For

Andhra Pradesh Rural Poverty Reduction Project

Prepared by

Society for Elimination of Rural Poverty

Contents

Executive Summary

Introduction

The Government of Andhra Pradesh has initiated the Andhra Pradesh Rural Poverty Reduction Project (APRPRP) with the support from The World Bank to enable the 'poorest of poor' to articulate their needs; access and influence the quality of services; and create their own opportunities to improve their livelihoods in a sustainable manner. The APRPRP project is proposed for 500 selected mandals in 16 revenue districts of Andhra Pradesh.

As part of the process of project formulation, the Livelihood Assessment (LA) study has been commissioned. This will be converted into an operational implementation plan- the Sustainable Livelihoods Management Framework that will also include specific Environmental Management Framework for the project as required by The World Bank. This Environmental Assessment Report is prepared by the Society for Elimination of Rural Poverty (SERP) with inputs from Center For Environment Concerns and the Centre for Environment Education.

Objective of the Study

The objective of the Environment Assessment Study is to prepare an Environmental Management Framework (EMF) for the APRPRP. The EMF for the APRPRP is being prepared based on the EMF currently being implemented in the APDPIP.

Scope of the Study

The scope of the Environmental Assessment study the outcome of which is this Environmental Assessment report is as follows:

- To provide an overview of the environmental context in the State with specific reference to the 16 districts proposed to be included in the APRPRP and to highlight the implications on the sub-projects that will emerge from the APRPRP
- To provide an overview of the legal framework in the country and in the state of Andhra Pradesh with respect to environmental laws and regulations and to highlight the linkage of the same with the sub-projects
- To provide a listing of the possible impacts and mitigation measures for sub-projects that could emerge from the APRPRP
- To design an Environmental Management Framework (EMF) for the APRPRP that will include details of the environmental assessment procedures and tools, the capacity building requirements and the institutional arrangements.

Methodology

The methodology followed by SERP for the development of this report included a review of the EMF for APDPIP, inputs from Center for Environment Concerns, public consultations, development of the Pest Management Plan, and inputs from Centre for Environment Education.

The CIF Sub-projects

The activities to be financed under the Community Investment Fund (CIF) of the APRPRP would be demand-driven sub-projects to be proposed by the Self Help Groups (SHGs) based mostly on the analysis of their livelihoods in terms of their skills, resources, income-expenditure patterns and value-chains and the scanning of the new livelihood opportunities. These sub-projects are designed and appraised to ensure that they meet the criteria of productivity, equity and sustainability.

APRPRP shall also make investments in taking up pilot projects on the livelihood areas, including those that demonstrate environmentally sustainable livelihood enhancement.

The CIF sub-projects will not exceed a budget of $ 30,000 (about Rupees 15,00,000). The average value of each sub-project would be about $ 20,000 (about Rupees 10,00,000).

Based on the APDPIP experience it can be expected that the CIF sub-projects that would emerge in APRPRP would be in the areas of livestock development, minor irrigation, agriculture development, forest products, construction and micro enterprises.

The physical, biological and social impacts of the probable sub-projects have been predicted and their mitigative measures have been recommended in this Report in Chapter 4: Impacts and Mitigative Measures.

Legal Framework

It is important that the EMF remain responsive to the existing legal and regulatory framework. The following laws, regulation and policies are presented in this Report and their relevance to the CIF sub-project context is discussed in Chapter 2: Policy, Legal and Regulatory Framework:

Relevant Central Government Laws and Regulations

- Environmental Impact Assessment Notification, 1994
- Wildlife (Protection) Act, 1972
- Coastal Regulation Zone Notification, 1991
- The Insecticide Act, 1968 and the Insecticide Rules, 1971

Relevant State Government Laws and Regulations

- The Andhra Pradesh Forest Act 1967
- Andhra Pradesh Protected Forest Rules, 1970
- The Andhra Pradesh Water, Land and Trees Act, 2002 and the Andhra Pradesh Water, Land and Trees Rules, 2002
- The Andhra Pradesh Saw Mills (Regulation) Rules, 1969
- Andhra Pradesh Forest Produce Transit Rules, 1970
- The Andhra Pradesh Minor Forest Produce (Regulation of Trade) Act, 1971
- The Andhra Pradesh Scheduled Areas Minor Forest Produce (Regulation of Trade) Regulation, 1979
- The Andhra Pradesh Preservation of Private Forest Rules, 1978
- Andhra Pradesh (Protection of Trees and Timber in Public Premises) Rules, 1989
- The Andhra Pradesh Charcoal (Production and Transport) Rules, 1992

Operational Policies of The World Bank

- OP 4.01 Environmental Assessment
- OP 4.36 Forestry
- OP 4.04, OP 4.04 a, BP 4.04 Natural Habitats
- OP 4.09 Pest management
- OP 4.37 Safety of Dams
- OD 4.30 Involuntary Resettlement
- OP 4.11 Cultural Property
- OD 4.20 Indigenous Peoples

Environmental Management Framework

The purpose of the Environmental Management Framework (EMF) is to ensure that neither the livelihoods of the poor nor the environment are compromised. It is to explore possibilities of making the efforts to improve livelihoods as well as conservation of the environment complimentary so that there are sustained benefits from the developmental activities initiated. The EMF for the APRPRP is prepared based on the experiences and learnings gained so far in the implementation of the Framework designed for the APDPIP. The details of the EMF are in Chapter 5: Environmental Management Framework.

Specifically, the EMF will contribute to the goal of poverty reduction by:

- preventing and/or mitigating any negative environmental impact that may emerge from the sub-projects
- ensuring the long term sustainability of benefits from sub-projects by securing the natural resource base on which they are dependent
- facilitating pro-active sub-projects that can be expected to lead to increased efficiency and improved management in the use of natural resources resulting in improvements in local environmental quality and human well-being

Environmental Assessment of CIF Sub-projects

Based on the *scale* and *nature* of sub-projects currently emerging from APDPIP the screening procedure for the APRPRP has been identified. The sub-projects depending on the location, type and nature of impacts are categorized as Level 0, Level 1, Level 2 and Level 3.

- Level 0: A detailed environmental assessment is not required for sub-projects in this category (such as a sub-project on tailoring).
- Level I: The proposed sub-project has either marginal or short-term impact on the natural resources or environment (such as a small scale cooking operation that consumes fuel wood). This will be done by the Community Coordinator.
- Level II: If the proposed project has a significant or irreversible or long-term negative impact (such as bore well leading to depletion of ground water), Level II assessment is suggested. This will be done by the district level Environment Resource Group members.
- Level III: If the proposed sub-project has a severe adverse environmental impact, that cannot be mitigated within a feasible timeframe and budget, Level III assessment is suggested. This will be commissioned by the State Project Monitoring Unit in consultation with the State Environment Agency.

A listing of sub-projects that fall into each of these categories is presented as 'Sub-project Classification Table' (Appendix 5.1). This listing will be updated on a half-yearly basis to include any new sub-projects that have been recently developed. The 'Criteria for Decision on Level of Environmental Assessment' (Appendix 5.2) is also presented. The 'General Guidelines' (Appendix 5.3) will help in decision making with regard to any sub-project that is not currently covered in the listing of sub-projects.

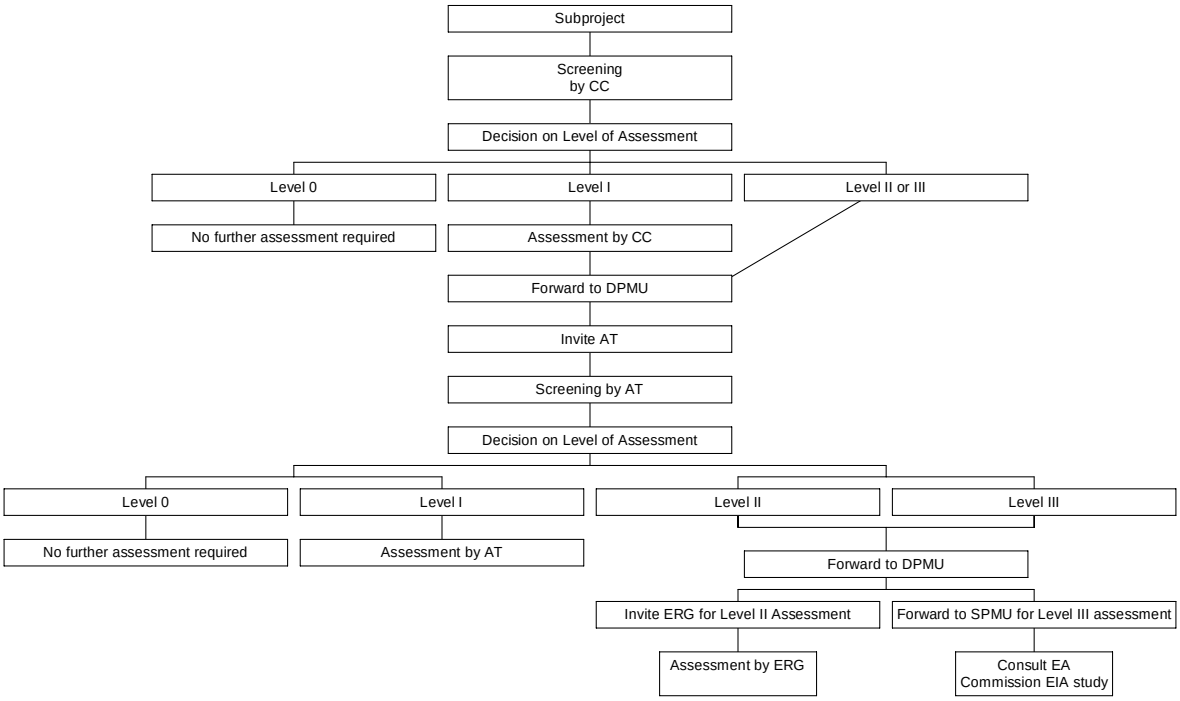
Once the sub-projects are classified, the CC checks the 'Negative List of Sub-projects' (Appendix 5.4). If the sub-project falls in the negative list, then it is rejected.

After classifying the sub-project and ensuring that it does not belong to the negative list, the CC proceeds to use the Level 1 tools if the Level 1 assessment is required and forwards the sub-project proposal along with the results of the assessment to the DMPU.

After the proposal is forwarded by the CC to the DPMU, depending on the scale (in terms of finances) an Appraisal Team is invited by the DPMU to independently appraise the sub-project and make suitable recommendations. The Appraisal Team will use the Sub-project Classification Table and General Guidelines to check if the level of assessment identified by the CC for the sub-project is correct and then proceed to use the Level I tools to determine the impacts and suggest mitigation measures. If a Level II or a Level III assessment is required, the sub-project is referred to the DPMU for further action.

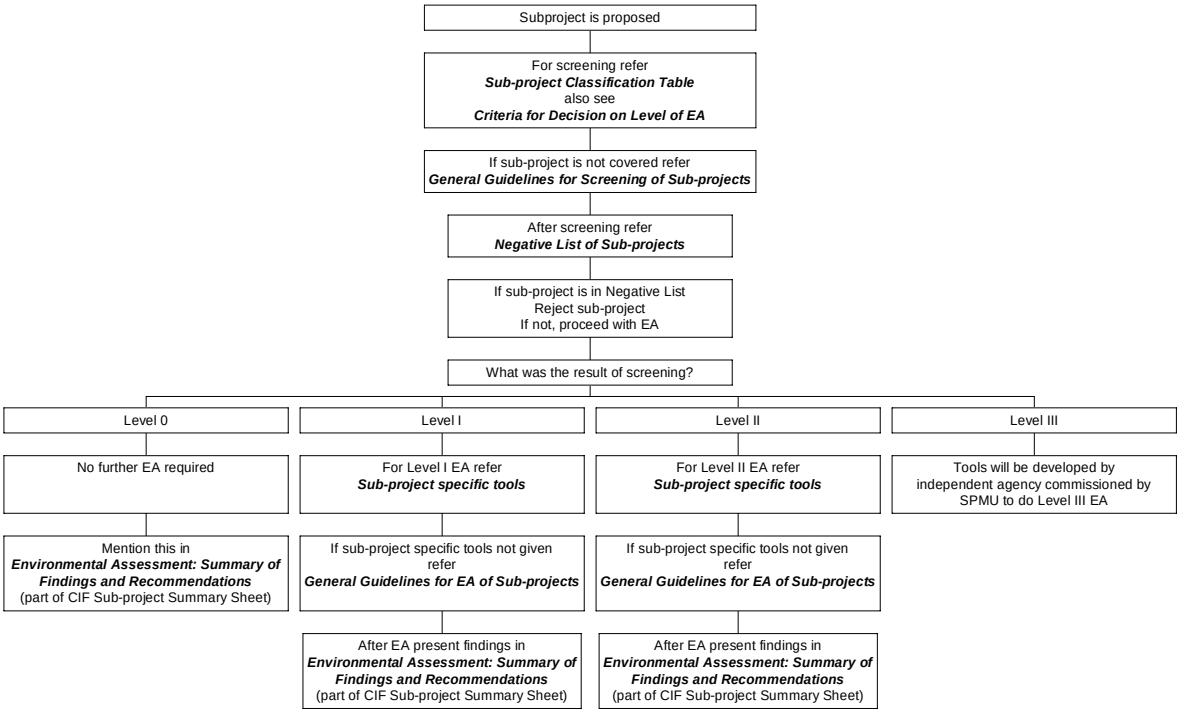
For a Level II assessment the DPMU invites the Environment Resource Group (ERG) members to conduct the assessment. For a Level III assessment the DPMU forwards the sub-project proposal to the SPMU for further action.

Process of Environmental Assessment



An indicative set of tools (for Level I and Level II assessments), based on those developed as part of APDPIP, are presented (Appendix 5.9). These tools will need to be modified based on feedback from users. More tools will need to be developed to cater to the assessment needs for new sub-project areas that emerge from time to time. A generic tool to cater to any other sub-projects (which are so few in number that a new tool need not be developed) has also been presented (Appendix 5.5).

Guideline for Use of Tools for Environmental Assessment



Training

Training programmes to equip the DPMU staff members (responsible for facilitating implementation of the EMF) and the ERG members in using the environmental assessment tools will be organized by the Environment Agency.

The DPMU staff, the ERG members and the Livelihood Associates (LAs) will form the core group of trainers who will train the CCs and the Appraisal Team members in environmental assessment. The training will involve an initial orientation workshop, a main training programme and refresher-training programmes.

A session on the EMF will be part of the induction training for the Village Activists. Each CC will organize environmental awareness programmes for the communities he/she is working with at least once every year.

Institutional Arrangements

The administrative set up followed for APDPIP has been retained for APRPRP with some modifications. The modifications have been made based on the learnings from the APDPIP experience in order to provide ease of functioning and understanding the project.

The basic administrative structure in APRPRP for the implementation of the EMF will be at the State, District, Mandal and Sub-project levels:

State Level
Internal: State Project Management Unit (SPMU)
External: Environment Agency

District Level
Internal: District Project Management Unit (DPMU)
External: Environment Resource Group (ERG)

Mandal Level
Mandal Community Support Cell (MCSC)

Sub-project Level
Internal: Sub-project Level Support by Livelihood Associates

Proactive Environmental Pilot Projects

The EMF will proactively encourage the emergence and implementation of sub-projects which contribute to improved livelihoods through the conservation of the environment as special sub-projects. These sub-projects will be so chosen that the community would demand the same after successful demonstration of the pilot sub-projects and would put forward sub-project proposals for funding under the CIF. Sub-projects will be developed in 8 areas which will include:

- Those that involve the use of alternate resources (for example, biomass gassifiers for rural electrification)
- Those that focus of efficient use of existing resources (for example, fuel efficient cook stoves)
- Those that create or enhance natural resources to support livelihoods (for example, energy plantations, water conservation works)
- Those that create or enhance systems for sustainable management of natural resources (for example, community fodder plantations, IPM practices)
- Those that enhance awareness on local environmental management for sustainable livelihoods (for example, environmental education programmes)

The SPMU will supervise the implementation of the special sub-projects. In all 32 pilot sub-projects would be implemented in the 16 APRPRP districts. Each pilot sub-project will cover 4 to 5 villages.

The State Environment Agency will collect and disseminate information on the proactive environment intervention options to the APRPRP functionaries through educational material and through integration of these components into the training programmes. It will also provide information on technical expertise that can be tapped for implementation of the special sub-projects.

Environmental Supervision, Monitoring & Auditing

Environmental supervision would be carried out at two levels. At the district level, as part of their overall supervisory responsibilities, the APRPRP staff would be required to verify that CCs are correctly using EMF guidelines and outputs, and the environment mitigation measures prescribed in the approved sub-project are implemented. The DPMUs would verify these issues from the same sample of sub-projects that they use for other supervisory requirements, and the results would be included in their overall supervision reports provided to the SPMU. These supervision reports would be submitted to the Environment Agency for review of the EMF implementation.

At the state level, the Environment Agency will conduct six-monthly supervision of the EMF, selecting a sample of Level I, Level II and all the Level III category sub-projects to assess the following:

- the technical viability and user-friendliness of the environmental assessment tools used by the CCs, the Appraisal Team members and the ERG
- the accuracy of application of the screening process by the CCs, the Appraisal Team members and the ERG
- the implementation and effectiveness of the mitigation measures recommended by the CCs, the Appraisal Team members and the ERG
- the quality and quantity of sub-projects that proactively contribute to environmental conservation while addressing the core concern of poverty alleviation
- the implementation of community environmental awareness programmes by the CCs

Supervision of the EMF will commence once the CCs and Appraisal Team members are trained in the EMF and will continue on an on-going basis once every six months.

It is the responsibility of the Environment Agency to remain abreast of the changing environmental conditions and emerging environmental concerns in the APRPRP areas. The EA will constantly be involved in collecting information from various departments of the Government and civil society sources. On the basis of the information, the Environment Agency will recommend revisions to the EMF and highlight local concerns to the DPMUs. Details of changing conditions, emerging concerns, recommended revisions and local issues would be included in the six-monthly monitoring reports provided to the SPMU.

The Director of SPMU will contract an Environmental Audit of APRPRP to an external agency (other than the Environment Agency) once in two years to assess the effectiveness of the EMP implementation. The principal focus of the audit will be to assess the extent to which the EMF has lead to the implementation of appropriate mitigation measures in the sub-projects and has promoted the implementation of environmentally beneficial sub-projects. A secondary goal of the audit would be to attempt an assessment of the extent to which the APRPRP sub-projects may have lead to improvement or deterioration in environmental quality.

The Environment Auditing Agency must review at least 5-10% of subprojects requiring an ER, 10-20% of subprojects requiring a LEA and all subprojects requiring an EIA.

Management Information System

The information requirements of the State and Regional Environment Agencies with regard to the sub-projects will be integrated into and provided through the MIS systems of APRPRP. The application of GIS as tool to assist in managing the information for the EMF can be explored.

Budget

The total budget of the EMF is:

(Rs. Million)	(US $ '000)
294.82	**5896.42**

Chapter 1

Introduction

1.1 Introduction

The Government of Andhra Pradesh has initiated the Andhra Pradesh Rural Poverty Reduction Project (APRPRP) with the support from The World Bank to enable the 'poorest of poor' to articulate their needs; access and influence the quality of services; and create their own opportunities to improve their livelihoods in a sustainable manner.

As part of the process of project formulation, the Livelihood Assessment (LA) study has been commissioned. This will be converted into an operational implementation plan- the Sustainable Livelihoods Management Framework that will also include specific Environmental Management Framework for the project as required by The World Bank. This Environmental Assessment Report is prepared by the Society for Elimination of Rural Poverty (SERP) with inputs from Center For Environment Concerns and the Centre for Environment Education.

1.2 Objective of the Study

The objective of the Environment Assessment Study is to prepare an Environmental Management Framework (EMF) for the APRPRP. The EMF for the APRPRP is being prepared based on the EMF currently being implemented in the APDPIP.

1.3 Scope of the Study

The scope of the Environmental Assessment study the outcome of which is this Environmental Assessment report is as follows:

- To provide an overview of the environmental context in the State with specific reference to the 16 districts proposed to be included in the APRPRP and to highlight the implications on the sub-projects that will emerge from the APRPRP
- To provide an overview of the legal framework in the country and in the state of Andhra Pradesh with respect to environmental laws and regulations and to highlight the linkage of the same with the sub-projects
- To provide a listing of the possible impacts and mitigation measures for sub-projects that could emerge from the APRPRP
- To design an Environmental Management Framework (EMF) for the APRPRP that will include details of the environmental assessment procedures and tools, the capacity building requirements and the institutional arrangements.

1.4 Methodology

The methodology followed by SERP for the development of this report includes the following elements:

Review of the EMF for APDPIP: The documented information on the EMF for the APDPIP as well as the learnings based on the implementation experience was the basis for planning the development of this Environmental Assessment report.

Inputs from Center for Environment Concerns: The Centre for Environment Concerns in association with Ernest and Young undertook the preliminary work of developing this report.

Public consultations: The Centre for Environment Concerns organized public consultations at the district and state levels in order to obtain the views and suggestions of the public on the EMF and on the Pest Management Plan.

Pest Management Plan: A Pest Management Plan has been developed by the Centre for Environment Concerns with a view to promote and support safe, effective and environmentally sound pest management in agricultural interventions undertaken in the APRPRP.

Inputs from Centre for Environment Education: Based on the experience of designing and implementing the EMF for APDPIP the Centre for Environment Education has provided inputs into this Environmental Assessment report.

1.5 Project Location Overview

1.5.1 Overview of the State of Andhra Pradesh

The APRPRP project is proposed for 500 selected mandals in 16 revenue districts of Andhra Pradesh. As the proposed mandals in the 16 districts would cover the whole geographic span of Andhra Pradesh, it becomes relevant to first examine the environment of the State.

Andhra Pradesh is the fifth largest state in India, both in terms of area as well as in terms of population. The states of Madhya Pradesh, Chattisgarh and Orissa on the north, Bay of Bengal on the east, Tamil Nadu and Karnataka on the south and Maharashtra on the west, bound the state. The total area of the state is over 2,75,000 sq. km., while the population is 66.3 million of which 48.26 million live in rural areas. Population of tribals is 6.31% of the total population of the state. The density of population is 242 persons per sq. km.

The state is administered in 23 revenue districts, which are further subdivided into 1,104 revenue mandals. The mandals in turn constitute village panchayats.

Andhra Pradesh is divided into three distinct regions namely Telangana, Rayalaseema, and Coastal region. Telangana comprises ten districts, Rayalaseema comprises four districts and the Coastal region is made up of nine districts.

Please see Annexure 1.1 Map depicting location of Andhra Pradesh in India and Annexure 1.2 Map depicting districts of Andhra Pradesh.

1.5.2 Physiography

Physiographically, the state can be divided into three zones viz., Coastal plains, Eastern Ghats and Peneplains. The state being a part of peninsular India is seismically highly stable.

Coastal Plains: On the east of the state the seacoast extends from Srikakulam in the north to Nellore in the south. The length of the coastline running along the Bay of Bengal is about 980 km. The coastal plains are bordered by the Eastern Ghats towards the landward side.

Eastern Ghats: Eastern Ghats are the mountain ranges that run all along the state from the North to the South and represent one of the diverse ecological forms. However, the ghats are not continuous and high. The northern section has ridges in the Chintapalle and Gangarajumaduguala mandals of Vishakapatnam district. The Papikonda range in the north of the state joins the Simhachalam hill range. Mahendragiri, the highest peak in Andhra Pradesh, rises to a height of 1500 m above sea level and is a part of the Eastern Ghats. The Yarada hills extend towards the coast along Vishakapatnam. The Dolphin Nose at Vishakapatnam is part of the Yarada hills and forms the land-locked natural harbour. At about 160 kms to the south of the river Krishna are the Nallamalai hills, which are small and denuded. The Papi hills and Sheshachala hills in Chittoor District and the Yerramala hills in Anantapur District are the branches of the Eastern Ghats. The Horseley hill range in Chittoor district is also the summer resort of the state. In the Northeastern part of the Telangana, these hills are known as the Sahayadri and Balagat hills. The Nirmal hills, Kandikal hills and the Anantagiri hills are the branches of the Sahyadri and Balaghat ranges.

Peneplains: The topography of the peneplain region consists of rounded low hills and the Deccan plateau. The Eastern Ghats slope towards the east border this area. These peneplains are formed due to intense weathering and denudation over a long period. Soils in this area are generally red sandy loams. Black soil also exists in the central and northeastern regions. The peneplains exist in districts of Anantapur, Kurnool and in all the districts of Telangana.

Please see Annexure 1.3 Physical Map of Andhra Pradesh.

1.5.3 Climate and Rainfall

The state has a tropical climate. The average temperature during the cooler months of December and January is 28 ^{0}C, and in the summer months of May and June the temperature reaches 40 ^{0}C. Most parts of the state in summer are hot and humid. Hyderabad, the state's capital however, can be hot and dry in the peak summer month of May. The annual average temperature is 31.5 ^{0}C.

The state is principally fed by the southwest monsoon while the northeast monsoon contributes about one-third of rainfall. The east coast region has been prone to disastrous cyclonic storms, which have destroyed much life and the livelihood of the villagers in the area. Rainfall mainly occurs during the monsoon period of June to September (an average of 57 cm) while it is only 3 cm between December and March. About two thirds of rain, falls in the northeastern part of the state.

Implications for the CIF sub-project context
Much of Andhra Pradesh is in the semi-arid zone. Rainfall is concentrated in a few months in the year. In the Telagana and the Rayalaseema region there may be a demand for irrigation facilities to support agriculture.
In the northeastern districts which receive most of the rain and which have portions of the Eastern Ghats, the focus needs to be on controlling soil erosion and harvesting the rain water.

1.5.4 Water Resources

1.5.4.1 Surface Water

The Godavari and Krishna are the two major river systems in the state. The river Godavari is both the largest and the broadest river in the southern India. Having originated at Triambakeshwar near Nasik in Maharashtra, it traverses along Karnataka and enters into the state at Baster. At Polavaram it enters the plains. Near Dowleshwaram it divides into three branches and forms a delta.

The Krishna enters the state at Alampur having originated at Mahabaleshwar in Maharashtra. After traversing Vijaywada, this river divides into two and forms a delta. Tungabhadra is an important tributary of the river Krishna. Nagarjunasagar Dam at Nandi Konda, Srisailam project at Srisailam and Prakasam barrage at Vijayawada, are constructed on this river.

The other important rivers in the state are the Pennar, Vamsadhara and the Nagavali. All the rivers are rain fed and of great economic significance because they are the source for hydropower and irrigation.

The two major lakes in the state are the Kolleru and Pulicat. While the Kolleru lake lies in the delta between the rivers Krishna and the Godavari, the Pulicat lake is located in the southern tip of Nellore district, close to the sea.

Implications for the CIF sub-project context
In addition to the major surface water resources, there are several medium and small rivers, rivulets, lakes and tanks that have a direct impact on the livelihoods of the poor. Management of these water resources in a way that is sustainable ecologically and economically needs to be a focus area for developing proactive environmental sub-projects.

1.5.4.2 Ground Water

The estimated groundwater potential in the state is 35,290 mcm. Out of this, 15% of the total groundwater potential is used for drinking and industrial purposes. The balance utilizable groundwater resources available for irrigation is in order of 30,000 mcm out of which 53% is available in command areas. The development of groundwater in the state is mainly through 12.20 lakh open wells and 3.16 lakh bore/tube wells. During the last two decades there is a twofold increase in well population with 16 lakhs in 1995-96. In recent years the shallow open dug wells are being replaced by deep bore wells. They have shown a six-fold increase in the last two decades from about 0.5 lakhs to over 3.0 lakhs.

Due to the exploitation of ground water by the deep bore wells the groundwater has gone down drastically in some areas. Between 1994 and 1999 the average fall in the water table is in the range of 0.5 metres to 4.5 metres in the Rayalaseema and Coastal regions and 3.5 metres to 8.0 metres in the Telangana region.

The department of ground water has established about 2,700 wells all over the state to monitor ground water levels and chemical quality of water. Based on the percentage of exploitation of the available ground water resources, the department of ground water has classified into Dark, Grey and White mandals. About 66 mandals in Andhra Pradesh have been declared as Dark mandals, Grey mandals are about 49 in number followed by 35 Saline mandals. The criteria considered for categorizing the mandals into Grey and Dark areas by Ground Water Department is as follows:
Grey Areas: Ground water exploitation between 65% to 85%.
Dark Areas: Ground water exploitation between 85%
However, the Groundwater Department is currently undertaking a reassessment of the groundwater exploitation in the state.
Please see Annexure 1.4 for list of APRPRP mandals identified as Grey and Dark.

Implications for the CIF sub-project context
In view of the declining ground water levels, focus need to be on meeting the water demands through water harvesting and conservation practices rather than on further ground water exploitation, as far as possible, especially in areas with high exploitation of ground water. Sub-projects for digging bore wells may be avoided dark areas.

1.5.4.3 Water Quality

The state has improved drinking water supply coverage remarkably in the past two decades. However, water quality analysis indicates that 40 percent of the people in the state are exposed to unsafe ground water. At least 3 million are exposed to severe health risks from bacterial, nitrates and fluoride contamination in the groundwater and piped water systems.

Bacterial contamination presents the highest and most immediate health risk, accounting for 35 percent of the highest exposure levels. Protection from contamination by human and animal waste is of highest concern for any water system used for drinking water purposes. The health risks due to microbiological contaminants include gastrointestinal illness, hepatitis, diphtheria and reduced nutritional status. Contamination in majority of the areas results from high population densities and underdeveloped water supplies (such as shallow or unprotected wells and poor maintenance of public pumps). The estimated rural population experiencing these problems is over 55 percent. Half a million people live within areas with severe fecal contamination of more than 2,000 MPN per milliliter in East Godavari, Krishna and Karimnagar districts.

Nitrate contamination is localized and is due to both agricultural runoff and household waste, with the relative contribution of each differing by location.

Water Quality and Health Issues in Andhra Pradesh

Quality issue	**Problem districts**	**Limitations on water use**	**Affected population**	**Time-lag between cause and effects**	**Scale of issue**
Pathogens	East Godavari Krishna Cuddapah Karimnagar Kurnool Rangareddy Hyderabad	Drinking water Recreation Marked impairment for food industries	8.8-17 million people exposed to > 100 MPN/ml	< 1 year	Local
Nitrates	Kurnool Rangareddy Chittoor Warangal	Drinking water Aquatic wildlife and fisheries Marked impairment for food industries	Over 6 million people exposed Over 125,000 infants at risk	> 10 years	Local regional
Fluoride	Karimnagar Kurnool Nellore Nalgonda Medak Vizianagaram	Drinking water	415,000-438,000 people at serious risk	>1 year	Local
Pesticides	East Godavari Krishna Nellore Warangal	Drinking water (especially for pregnant women) Aquatic wildlife and fisheries Recreation	Limited data	<1 year to > 10 years	Local Regional

Industrial discharges (SS, BOD, COD, Metals)	East Godavari Nellore Vizianagaram West Godavari Adilabad Khammam	Drinking water Aquatic wildlife and fisheries Recreation Agriculture Industrial uses	Limited data No direct link	<1 year to > 10 years	Local regional

Karimnagar, Krishna and East Godavari appear to be the districts with the highest risk levels of ground water contamination from. Application of pesticides and fertilizers is a major non-point water pollution source in the state. Among the different states in India, Andhra Pradesh is one of the highest users of pesticides (16 % of the pesticide consumption of India is from Andhra Pradesh). Districts with the highest application of pesticides are Guntur, Krishna, East Godavari, Nellore and Warangal.

The house hold and agricultural sources have a greater impact than the industrial sector on the water quality problems that have the most direct effect on the health of large numbers of people. On the other hand, industries are the largest contributors to very toxic and persistent contaminants like heavy metals, which can have long-term health effects.

Implications for the CIF sub-project context
In view of the large numbers of people exposed to unsafe drinking water, there is a need for emphasizing on safe water supply on the one hand and on the need for ensuring that the sub-projects do not aggravate the situation by contributing further to water pollution. As non-point pollution from use of chemical inputs in agriculture is an emerging concern there needs to be an emphasis on encouraging alternatives to the use of heavy and unsafe chemical inputs.

1.5.5 Agriculture

Agriculture provides employment to about 68% of the work force in the State (1991). 22.74% of Andhra Pradesh's income (1997-98) comes from agriculture. The principal crops grown (in terms of area) are rice, oil seeds, groundnut, pulses, other cereals and millets, cotton, jowar, sugarcane, castor, sesamum and tobacco. About 500 sq. km of the forest area (0.78%) is reported to be under shifting cultivation.

More than 60% of the net sown area in the State has no assured irrigation facilities, and depends on rainfall. The net irrigated area in the State has increased from 23.70 lakh ha. (22.94% of the net sown area) in 1951-52 to 39.85 lakh ha. (38.45% of the net sown area) in 1994-95.

The major source of irrigation in the State in 1951-52 was canals followed by tanks. These two sources accounted for 85.27% of irrigated land in the State. Well irrigation accounted for only 12.91%. This dominance of canals and tanks as a source of irrigation continued up to 1980-81 and thereafter, wells gained prominence and occupied the second position, pushing tanks into the third position.

Salinization due to water logging from improper drainage is a problem in the command areas of irrigation projects in the State. Several thousands of hectares have been waterlogged as a result of the Sriramsagar, Nagarjunasagar, Tungabhadra and Srisailam projects.

The use of chemical inputs in agriculture has been on the increase in the State. Fertilizer use increased six times from 2,93,200 tonnes in 1970-71 to 17,51,500 tonnes in 1995-96. The leaching of excess fertilizers pollutes surface water bodies (causes algal blooms) and causes nitrate pollution in ground water. Andhra Pradesh is currently the largest consumer of pesticides in the country accounting for 16.11% of the total pesticide consumption. Indiscriminate use of pesticides adversely affects human and environmental health.

The use of commercial energy in the agricultural sector has also been on the increase. The number of pump sets (used for irrigation) has increased from 9,536 in 1956 to 10,98,692 in 1993. This is naturally associated with increased levels of ground water extraction.

Implications for the CIF sub-project context
Considering the lack of irrigated facilities a demand for irrigation facilities may be a significant CIF sub-project area.
The past trends indicate that the demand may be more for bore well irrigation.
Rejuvenation of tank irrigation, which has lost prominence over the years, provides an opportunity for pro-active environmental intervention.
Proper drainage is an aspect that needs consideration in irrigation projects.
The scenario in terms of chemical inputs, especially pesticides, is extremely serious requiring a through examination of pesticide use in the CIF sub-projects.

1.5.6 Livestock

Animal husbandry, dairy, poultry, fishery and forestry contribute 15 per cent of the State Domestic Product from agriculture and provide supplemental employment and income to a large number of people, especially the poor.

The fodder availability in the State is less than the demand. While the requirement of green fodder in the State is 84.89 million tones, only about 28.91 million tones are available. The result is that livestock are underfed and productivity is low.

Implications for the CIF sub-project context
As there is a likelihood of demand for livestock under CIF sub-projects, the grim fodder situation needs to be addressed.
Strategies to meet the demand for fodder can be a focus area for pro-active environmental intervention

1.5.7 Fisheries

The production of inland and marine fish was 2.04 and 1.52 lakh tones in 1995. These were 0.83 and 1.51 lakh tones respectively in 1961. There is a significant increase in inland fishery. According to the 1993 livestock census, there are about 8.83 lakh fishermen in the State. There are 54,000 traditional crafts and 8911 mechanized vessels including 1869 trawlers in the State.

Implications for the CIF sub-project context
Inland fishery seems to be on a growing trend in the State. There may be a demand for inland fish rearing as a CIF sub-project area.

1.5.8 Energy

The consumption of commercial energy is steadily increasing in the State. The agriculture and industrial sectors are the biggest users of commercial energy in the State followed by the domestic and the commercial sectors. Electricity in rural areas is plagued by problems of poor voltage and intermittent supply.

91.56 % of rural households depend on fuel wood for cooking. This is followed by 3.37% who use cow dung cakes as the cooking fuel. Of immediate concern is the fact that the carbon monoxide in smoke from open woodstoves affects the health of the rural poor, especially women who are the main users of biomass fuels.

Implications for the CIF sub-project context
Considering the great dependence on biomass fuels for cooking, fuel plantations, efficient cook stoves and alternative fuels such as biogas can be explored for proactive environmental interventions through the CIF sub-projects.
Considering the poor quality of rural electricity supplies, alternative to meeting rural electrification needs such as biomass gassifiers can also be explored.

1.5.9 Industries

There are about 1000 medium and large-scale industries in the state with a capital investment of around Rs. 2,00,000 crores or US $ 5 Billion. These industries provide employment for about half a million people.

Another million people are employed in the 100,000 small industrial units, which exist in the state. The main industrial products of the state include pharmaceuticals, chemicals, cement, fertilizers, paper, coal, limestone, asbestos, shipbuilding and marine products.

The state also happens to be the largest maritime state in India. Active trade occurs at the four major ports namely Vishakapatnam, Kakinada, Masulipatnam and Krishnapatnam. Vishakapatnam port besides being the home of the ship building industry, also handles a large volume of industrial traffic. In fact, this port also serves the states of Madhya Pradesh and Orissa.

Implications for the CIF sub-project context
While the sub-projects themselves are out of the scope of large industrial activity, the experience of APDPIP suggests that the livelihoods of the poor may be impacted by large scale industrial activity. The impact of industrial pollution on quality of surface and ground waters and thus on the productivity of agricultural land is an example. The EMF needs to be able to address such problems, through the existing regulatory framework of the state, as when they arise in the APRPRP districts.

1.6 Overview of the 16 APRPRP Districts

1.6.1 Cuddapah

Cuddapah has a land area of 15359 sq. km. comprising a total population of 22.67 lakhs. There are fifty mandals in the district. Gross irrigated area constitutes of 40.2% of the total area. The forest type is of dry deciduous with patches of moist deciduous and constitutes an area of 3480 sq. km. The dense forest constitutes an area of 702 sq. km and the total area of open forest is 2778 sq. km. The total area of land with scrub is 1234 sq. km. Major crops practices in this region are Rice, Jowar, Cotton, Turmeric, Maize, Arhar, Chillies, Sugarcane and Sesame. Among these crops, Rice and Cotton yields are high. 15.33 % and 3.27 % of the total area of the district is utilized for rice and cotton cultivation respectively. The Sri Lankamalleshwara and the Sri Venkateshwara sanctuaries are in the district.

1.6.2 East Godavari

East Godavari district which is closely associated with river Godavari occupies a major portion of the delta. It is located within Latitude $16^0$30' and $18^0$20' N and Longitude 81^0-30'-$82^0$36' E, with Visakhapatnam district on the east, Orissa on north; Khammam and West Godavari districts on the west and Bay of Bengal on south. Kakinada is the HeadQuarters of this district. The district can be broadly classified into three natural zones- the Delta, upland and Agency Tract. The total Geographical area of the district is 10,807 km^2 The district has 57 administrative mandals. Physiographically the district has been divided into 3 regions viz. Hill Track of Eastern Ghats in the north, the uplands in the middle and the deltaic plain in the south. The main river is Godavari, which enters the district at Devipatnam. At Dowleswaram the river attains a width of 4.6 km and the flow is impounded by an ancient (Sir Arthur Barrage) for irrigation. At this point, the river is being divided into two distributaries i.e Gauthami, Godavari and Vashista Godavari. All the three joins Bay of Bengal. The Tributaries – Gudiyeru, Pamuleru, Polavaram vagu, Sileru drain in the Agency area. Another minor river Yeleru River drains part of upland mandals. Tandava river flows in Tuni and Thondangi mandals. Of the total geographical of 10,80,700 ha of the district, the major category is agricultural land, which is 55.88% of area. The rest of the land is distributed under forests (25.5%), waste lands (8.0%) and water bodies (5.1%). The built up area constituted only 5.4% of area. The cropped area is predominantly in the deltaic plain, flood plain of the river Godavari and to a less extent in upland. In kharif season nearly half the area is occupied by crops-paddy, sugarcane and tobacco. In Rabi season the area is confined to land with assured irrigation like delta, tanks, wells and bore wells. The rabi crop are raised in 45% of agricultural land. East Godavari is a highly productive district. About 10% of agricultural production in the state comes from this district. Over 72,301 ha or 6.69% of area is under plantation. The plantations are mango, cashew and citrus identified in uplands and coconut in deltaic terrain. The largest waste land category (77%) is land with or without scrub, which is 66,723 ha, next are 11,237 sqkm

marshy/swampy land (13.0%) and lastly the sandy area (7.5%). The river stream constituted 4.4% (47,482 ha) while lakes / reservoirs / canals are 0.7% of area. Besides these water bodies there are 785 ha of fish tanks.

1.6.3 West Godavari

West Godavari district is located in the western banks of the river Godavari which is the largest river in South India. It lies between $16^0$15' to $17^0$31' North Latitude and $80^0$51' to $81^0$55' East Longitude. It is bounded by the district of Khammam in the north, Bay of Bengal and parts of Krishna district in the south, in the east by the western banks of river Godavari and on the west by Krishna district. The total geographical area of the district is 7795 km^2. It has a coast line of 20km. The district has 46 revenue mandals and the head quarters of the district in Eluru. The district can be divided broadly into three physiographic units viz. hills, uplands and delta, which can be distinctly observed as we proceed from north to south. The Godavari is the important river flowing all along the eastern border of the district. The other minor rivers are – Tammileru, Yerrakaluva and Jalleru, Gunderu, Budameru. Except –Yerrakaluva, all other minor streams flow into Kolleru lake. The Kolleru lake covers part of West Godavari and Krishna districts and is 30 km from the Bay of Bengal. It broadly lies between Kaikalur and Eluru towns. The lake is shallow with depths ranging from 0.5 to 0.2 m. The lake receives water from two rivers, 15 irrigation channels and 15 drains from Krishna and Godavari barrage irrigation system. Tidal water enters the lake through Upputeru, the only out let from lake to Bay of Bengal. The lake is one of the most significant wet land habitats in India. A large segment of fresh water fishery resources of the State comes from the lake. It also provides the best winter breeding grounds for migratory bids. But the lake is neglected and is fast decaying due to occupation of lake floor for commercial purposes. For the last decade its ecosystem has been disrupted by human intervention. The main factors are illegal encroachments of lake bed area for agriculture, construction of fish ponds, release of industrial waste effluents from near by industries and increase in aquatic weeds.

The major categories of land cover / land use identified in the district are agriculture (69.9%), forest land (11.14%), waste land (2.04%) and water bodies (1.05%). The total agricultural land in the district was 5,44,889 ha occupying 69.90% of the total area. The main land use / land cover classes identified under agriculture are Kharif 4,68,936 ha (86.06%), Rabi 4.04,223 (74.18). The double-cropped area is 4,00,321 ha and the plantation area is 72,051 ha (13.32%). The forest area in the district estimated as 86,827 ha of which deciduous forest is very high in the district (56.62%) while degraded forest (or) scrubland (21.82). The wasteland in the district was 15910 ha. The category of waste lands in the order of land with (or) without scrubs 11,672 ha (73.36%) marshy / swampy land 3,456 ha (21.72%) gullied / ravinous land 782 ha (4.92%) while the other types are absent. A vast number of fish tanks have been identified in and around the Kolleru lake and in the southern part of the delta. The area under this category has been estimated as 14,728 ha.

1.6.4 Ranga Reddy

The total land area of the district is 7493 sq. km. the forest cover type is open in nature, no dense forest is found in this region. The open forest area is 343 sq. km. Land with Scrub area is 216 sq. km.

1.6.5 Karimnagar

Karimnagar district occupies a geographic area of 11823 sq. km and comes under Telangana region. The district has forest cover, which is mostly riverine forest, the total area covered by dense forest is 617 sq. km, and open forest area is 1021 sq. km. The Sivaram sanctuary is in this district.

1.6.6 Khammam

The total geographic area of Khammam district is 16029 sq. km. the total forest cover in this region is quite high and the forest type is mostly dry deciduous teak forest. The total area covered by the forest is 7310 sq. km. The dense forest occupies an area of 5192 sq. km and the open forest area is 2118 sq. km. The Kinnerasani sanctuary is in this district. The Kinnerasani sanctuary is in this district.

1.6.7 Krishna

Krishna district is located between $15^0 43'$ and $17^0 10'$ of the North latitude and $80^0 33'$ of the East longitude extending over the area of 8727 sqkm with a coast line of 88 km. The district is surrounded in the East and southern by the Bay of Bengal, Guntur and Nalgonda district on the west and Khammam and W.Godavari districts on the Northern side. It comprises of 50 mandals. The population of the district is 36,98,833 (1991 census). The famous river Krishna is flowing in this district. Among the other streams and tributaries Munneru, Budameru and Tammileru are significant. Besides these, minor hill streams like Jayanti, Kattaleru, Ippalavagu, Upputeru, Telluru, Balleru and Nadimiyeru, which also flows through the district. Kolleru Lake, which is the fresh Water Lake, spreads both into W.Godavari and Krishna districts. The major land use / land cover categories identified in the district are agricultural land (71.33%), forest land (6.19%), waste land (6.10%) and water bodies (1.93%). The highest land use category is for agriculture. The agriculture land is constituting 71.33% of the total area (6.22 lakh ha). Plantations occupy 61,000 ha which is 9.8 % of total agricultural land. Mango, Coconut, Citrus, Cashew and Casuarina are the main plantations grown in the district. Fish tanks are present in an area of 18,356 which is about 2.1 % area. Most of the fish tanks are identified and mapped near the coastal marshy lands in the Kolleru lake area and amidst fields. Swampy areas and lake peripheral areas are converted into fish tanks by specially constructed ponds according to specifications for pisciculture. The high category of forestland in the district is degraded forest, it constitutes 58.97% of total forest area. The next is Marshy / Swamp lands constituted 17,125 ha with a percentage of 24.6% of total forestland. The deciduous forest is only 2.24% (1503 ha). Mangroves occupy 12.5% of total forest (8,688). This mangrove land is present in the krishna estuaries in the mandal of Nagayalanka. The Kirshna sanctuary is in this district.
The total wasteland in the district occupying in an area of 53207 ha which is 6.1% of G.A of the district. Marshy / Swampy land occupying 64.14% (34125 ha). Salt effected soils, waterlogged land and Barren areas are not found. The total land under water bodies in the district is 16813 ha which is 1.92% of area.

1.6.8 Guntur

Guntur district is located on the East Coast of India between $15^0 18^{'}$ -$16^0 50^{'}$ N latitude and $70^0 10^{'}$-$80^0 55^{'}$ East longitude. The are of the district is 11391 sq.km with a population of 41.07 lakh (1991 census). The density of the population is 361 per sq.km. 28.89% of the population is living in the urban areas and the rest in rural areas. The district is bordered on the north by Krishna and Nalgonda districts and on the west by Prakasam and Mahaboobnagar districts on the south by Prakasam district, on the east by Krishna and Bay of Bengal. The district comprises of 57 revenue mandals. Geomorphologically the district is divided into 4 types - the uplands, the delta region, marine landforms and coastal sandy plains. The important rivers and riverlets in the district are the Krishna and the Naguleru, the Chandravasnka and Gundlakamma. The river Krishna traverses about 250 km through the district along the northern boundary of the district.

Four major types of soils occur in these districts viz. alluvial soils, uplands with black soils, uplands with red soils, coastal areas. The total geographical area of the district as per 1991-92 satellite data was 11,39,100 ha. The largest use of land in the district for agriculture (64.66%). The rest of the land distributed among forest (13.37%) built-up area (10%), wasteland (8.88%). The water bodies constituted 7.76%. The forest land present in an area of 1,65,969 ha constituting 13.37% of the total forestland degraded forest accounted for 64.3% (1,06,653 ha) the deciduous forest accounts for 24% (36,593 ha). Along the coastal areas in the district mangrove forest is present in an area of 4856 ha, which constitutes 3.19% of total forest area. The agricultural land in the district was reported as 7,36,555 ha constituting 64.66% of total geographical area of the district. Of this the Net sown area was 7,12,708 ha (96.76%). Of the total agricultural land 54% of the (3,97,956 ha) area was double cropped. The water bodies present in an area of 31,481 ha constituting 2.76% of total geographical area where as fish tanks present in an area 3780 ha constituting 0.33% of total geographical area. Most of the fish tanks are identified near the coastal marshy lands.

1.6.9 Nellore

Nellore district, the southern most coastal district of A.P lies between $13^0 30^{'}$ and $15^0 6^{'}$ of northern latitude and $70^0 5^{'}$ and $80^0 15^{'}$ of the eastern longitude. The geographical area of the district is 13076 sqkm, accounts for 4.75% of total area of the state. It is bounded on the north by Prakasam district, on the east by the Bay of Bengal, on the south by Chittoor district and Chengalpet district of Tamilnadu and on the west by Veligonda hills, which separate it from Cuddapah district. The district has a coastline of about 165km. Administratively the district is divided into 46 mandals, covering under three revenue divisions with head quarters at Nellore. Population of the district is 23.92 lakhs (1991 census). Pennar, Swarnamukhi and Kandaleru are the rivers in the district, which flows West to East direction and merge into the Bay of Bengal. Pulicat, the second largest brackish water lagoon in the country, is located in the district. The geographical area is 13.07 lakh ha. The land under arable agriculture is 39.54% (5,17,054 ha) while the rest is distributed among forest 15.47%, waste land 29.56%, built-up land 7.48%, water bodies 7.71% and others. Degraded forest constitutes the highest area by 1,13,085 ha (55.28) where as deciduous forest is 85,334 ha (41.71%) and the rest by forest plantations (1.85%) and mangrove forest (0.06%). Among the different categories of wasteland the major category found is land with or without scrubland which constituted 50.56% of total

wasteland followed by marshy land present in an area of 31,333 ha. The area under saline soils is 24,459 during 1991-92. However based on satellite data NRSA in 1995 reported that total salt effected area in the district is 65,405 ha. So there is increase in the salt effected soils in the district. The land under water bodies was found to be 100753 ha (7.7% of total G.A), while salt pans present to an extent of 1752 ha (0.13% of G.A). The land under aquaculture was shown to be only 1423 ha.

1.6.10 Prakasam

Ongole district was formed in 1970 taking some parts of Nellore, Kurnool and Guntur district. It was renamed as Prakasam district in the year 1972. This district is located on the east coast of India between $14^0 57'$ and $16^0 17'$ northern latitude and $78^0 45'$ to $80^0 25'$ eastern longitude. The geographical extent of the district is 17,626 sqkm. It is bounded on the north by Guntur district, on the south by Cuddapah and Nellore districts, on the west by Kurnool district and on the east by the Bay of Bengal. The district has a population of 27.59 lakhs (1991 census). It is having 102 km of shore line. There are 56 administrative revenue mandals in the district and the Ongole town is the district headquarters. The physiography of the district can clearly be divided into hilly tracts which are located towards the western side of the district. The Central portion comprises of large tracts of stony plains with rocky hills. The eastern portion of the district is consisting of sandy plains. The main rivers are Gundla kamma, Musi, Manneru and Paleru besides thers are some small rivers viz., Thammileru, Naguleru, Gudiseleru, Varaguvagu, Nallavagu and Mangalavagu. The main source of irrigation and drinking water is Gundlakamma River with a length of 220 km. The famous cumbum tank is also built across this river only. The major land use categories in the district are agricultural land (51.4%), forest land (24.6%), waste land (15.9%) and water bodies (1.4%). The total agricultural land in the district accounts for 51.38% of land use with an area of 9.05 lakh ha. Of the total agricultural land 98.73% is net sown area while double cropped area is only 11.56%. The famous Nallamala and Veligonda forest are spread among erstwhile Kanigiri and Giddalur taluks. In the total forest land deciduous forest occupies major portion present in an area of 3,30,938 ha constituting 78.4% of total forest land, degraded forest or scrub tungle is present in 77,221 ha occupying 18.3% of total forest, the remaining land is occupied by forest plantations, mangroves, barren rocky area, cropland. The Nagarjunasagar-Srisailam, Rollapadu and Gundlabrahmeshwaram sanctuaries are in this district. The major waste land category in the district land with (or) without scrub which constitute nearly 77% of total waste lands. According to estimates of NRSA 1995 the total salt effected soils in the district were reported as 83,209 ha. This shows that there is increase in salt effected soils in the district. Coastal sands constitutes 6%of total waste lands (16,7703), while other categories are barren rocky land, water logged, marshy land and gullied / ravinous land. Water bodies occupy an area of 24,682 ha constituting 1.4% of total area, with fish tanks in 187 ha.

1.6.11 Kurnool

The total Geographic area of Kurnool district is 17658 sq. km. The forest cover in the sanctuaries is dry deciduous mixed forest, open grasslands with thorny bushes and mixed deciduous forest. The Nagarjunasagar-Srisailam, Rollapadu and Gundlabrahmeshwaram sanctuaries are in this district.

1.6.12 Medak

The total land area of Medak district is about 434 sq. km and the forest cover is 1995 sq. km. The area of dense forest is 10 sq. km and the open forest is about 424 sq. km. the forest type is mostly mixed dry deciduous with patches Scrubs and grassy lands, and riverine forest. The Pocharam and Manjira sanctuaries are in this district.

1.6.13 Nalgonda

Nalgonda has a geographic area of 14240 sq. km. The forest cover is only open forest type and the area of the forest is about 170 sq. km. The Nagarjunasagar-Srisailam sanctuary is part of this district.

1.6.14 Nizamabad

Nizamabad has a land area of 7956 sq. km and the forest cover is about 1305 sq. km. the forest type is deciduous and the area of dense forest is about 576 sq. km. and that of open forest is 576 sq. km. The Nagarjunasagar-Srisailam sanctuary is part of this district.

1.6.15 Vishakapatnam

Visakhapatnam district is one of the North-Eastern Coastal districts of Andhra Pradesh and it lies in between $17^0$15'and 18^0 32' North latitude and 81^0- 54' and 83^0- 30' of Eastern latitude. It is bounded in the north partly by Orissa state and partly by Vizianagaram district, on the south by East Godavari district, on the west by Orissa state again and on the east by the Bay of Bengal. The total Geographical area of the district is 11161 km^2 with a population of 32.9 lakhs and density of 294 persons per $km^{2.}$ There are 43 mandals covering 4258 villages in the district, of which 11 mandals and 2,868 villages falls in the Tribal area. The district has a coast line of 132 km. The district presents three geographic divisions. The strip land along the sea coast, the interior, called the plains and the hilly area of the Eastern Ghats which is called as Agency Division and of the total geographic area, 55.8% is occupied by hilly region which are the tribal mandals; 31.3% by plains and the rest by coastal mandals. Of the 43 mandals in the district, 11 are in the tribal area, 22 in plains and the rest of 10 mandals are in the coast. The chief rivers draining in the district are Tandava, Varaha, Sarada, Narava, Gambeera gedda, Gosthani, Gurepreo and Machkund. All the rivers rise in the Eastern Ghats of the district and traverses from west to east and joins Bay of Bengal. Of the total geographical area of the district of 3.9 lakh hectares, nearly 35% is forest land, and 26.6% is waste land. The land put to non-agricultural use (built up area) is 7.2%. The agricultural land is over 30.3% of area.

1.6.16 Warangal

The district occupies a geographic area of 12846 sq. km. and the forest cover in this district is about 3259 sq. km., which is mostly dry deciduous type. The dense forest area is about 2412 sq. km. and open forest area is 847 sq. km. the forest. The sanctuaries in the district include the Eturnaragram and Pakhal sanctuaries.

Please see Annexure 1.5 for further details of the districts.

1.7 Overview of Ecologically Sensitive Areas

1.7.1 Hill Areas

The Eastern Ghats are the mountain ranges that run all along the state from the North to the South and represent one of the diverse ecological forms. However, the ghats are not continuous and high. They include the Papikonda range, Simhachalam hill range, Yarada hills, Nallamalai hills, Papi hills, Sheshachala hills, Yerramala hills, Horseley hill range, Sahayadri and Balagat hills, Nirmal hills, Kandikal hills and the Anantagiri hills. Portions of the Ghats harbour forests with rich biodiversity. Soil erosion (from pressures such as overgrazing), depletion of vegetative cover, mining, etc are some of the threats facing the Eastern Ghats.

1.7.2 Wetlands

The two major lakes in the state are the Kolleru and Pulicat lake. While the Kolleru lake lies in the delta area between the Krishna and the Godavari rivers, Pulicat lake is in the southern tip of Nellore district, near the sea. Both the lakes are habitat for several species of migratory birds. In addition to these there are several smaller wetlands, heronries, and mangrove areas, which serve important ecological functions. Though there are no Ramsar Sites in the State several wetlands are recognized for their ecological value.

1.7.3 Coastal Zone

The coastal region of our state has been divide into nine districts: Srikakulam, Vizianagaram, Vishakapatnam, Krishna, Guntur, Prakasam, Nellore, East Godavari and west Godavari. On the east of the state the seacoast extends from Srikakulam in the North to Nellore in the south. One of the major threats to the coastal zone is from intensive aquaculture being practiced along the coast. The problems from intensive aquaculture include salinization of groundwater in the surrounding areas, pollution of water from organic wastes and inorganic inputs used in aquaculture farms and over extraction of shrimp fry from the wild.

1.7.4 Protected Areas

Andhra Pradesh has 20 wildlife sanctuaries and four national parks. These protected areas are habitat to several endangered and endemic species of flora and fauna. The Red Sanders tree, the Great Indian Bustard, the Jerdon’s Courser and the Tiger are some examples of the critical natural wealth of the State. Habitat degradation, management strategies and problems such as poaching are the major threats to this natural wealth.

Name and Location	Particulars		
	Area (sq. km)	Forest type	Characteristic biological wealth.
Kawal Wildlife Sanctuary, Adilabad district	893	Dry Deciduous	Tiger, panther, gaur, cheetal, sambar, nilgai, barking deer, mouse deer, sloth bear and a variety of birds
Pranahita Sanctuary, Adilabad district (along tributary of river godavari)	136	Dry Deciduous	Tiger, panther, cheetal, black buck, Nilgai, sloth bear and a variety of birds such as ducks, teals, storks and herons
Sivaram Sanctuary, Adilabad and Karimnagar district	37	Riverine forest	Cheetal, sambar, nilgai, monkeys, langurs, jackals, wild of birds such as ducks, teals, boars, python, sloth bear, panther, tiger, marsh crocodile.
Eturnagaram Sanctuary, Warangal district	806	Dry Deciduous teak forest	Tiger, panther, gaur, cheetal, sambar, nilgai, black buck, barking deer, wild boar, wolf, jackal and a variety of birds
Pakhal Sanctuary, Warangal district	879	Deciduous	Marsh crocodiles, cheetal, sambar, nilgai, wild boar, gaur, python, wild dogs, foxes, jackals, hyena, sloth bear, panther, tiger, ducks, teals, spoon bills, storks, etc.
Kinersani Sanctuary, Khammam district	656	Dry Deciduous teak forest	Tiger, panther, gaur, cheetal, chowsingha, sambar, black buck, chinkara, sloth bear, wild dogs, hyena, wild boar, jackal, marsh crocodile aquatic birds
Papikonda Sanctuary, East and West Godavari district	591	Dry deciduous teak forest	Tiger, panther, gaur, cheetal, chowsingha, sambar, black buck, mouse deer, barking deer, sloth bear, wild dogs, hyena, wild boar, jackal, marsh crocodile and a variety of resident and migratory birds
Coringa Sanctuary, East Godavari district	236	Mangrove	Fishing cat, otters, jackal, sea turtle, estuarine, crocodile, gulls, storks, herons and flamingos.

Kolleru Sanctuary, West Godavari district.	673	Marsh	Large variety of water birds such as Gargenys, Teals, Pochards, Ducks, Storks, Herons and occasionally Flamingos and Grey pelicans
Krishna Sanctuary, Krishna and Guntur district	195	Mangrove	Fishing cat, otters, jackals, sea turtle, estuarine crocodile and a variety of seasonal birds.
Pocharam Sanctuary, Medak and Nizamabad districts	130	Mixed dry deciduous, patches of scrubs and grassy lands	Panther, sloth bear, wild boar, cheetal, sambar, nilgai, hyena, chinkara, chowsingha, jackal, python, teals, storks, duck, partridges and quails.
Manjira Sanctuary, Medak district	20	Riverine forest	Marsh crocodiles and a variety of water birds
Nagarjunsagar-Srisailam Sanctuary, Guntur, Prakasham, Kurnool, Mahaboobnagar and Nalagonda	3568	Dry Deciduous mixed forest	Tiger, Panther, sloth bear, wild boar, cheetal, sambar, nilgai, hyena, wolf, fox, giant squirrel, tree shrew, mouse deer, chinkara, chowsingha, jackal, Marsh crocodile, etc.
Rollapadu Sanctuary, Kurnool and Prakasham district	6.14	Open grasslands with thorny bushes	Great Indian Bustard, black buck, monkeys, wolf, jackal, russels' viper and cobra.
Gundla Brahmeshwaram Sanctuary, Kurnool and Prakasham district	1194	Mixed deciduous	Tiger, panther, cheetal, chowsingha, sambar, car, monkeys, langurs, mouse deer, black buck, sambar, nilgai, Pangolin, chikara, monitor lizard, marsh crocodile and python
Srilanka Malleshwaram Sanctuary, Cuddapah district	464	Dry deciduous mixed thorn forest	Red sanders endemic to the region, panther, sloth bear, cheetal, sambar, chowsingha, nilgai, chinkara, wild boar, fox, etc., and the endangered Jerdon's Courser found here
Nelapattu Sanctuary, Nellore district	4.4	Fresh water irrigation tank	Nesting ground for grey pelicians, open bill stork, white ibis, night heron, cormorant, teals, ducks, etc.,

Pulicat Sanctuary, Nellore district	500	Brackish water lake along bay of Bengal	Greater and lesser flamingoes, grey pelician, painted stork, grey heron, ducks, teals, herons, gulls and number of waders
Kaundinya Sanctuary, Chittor district	358	Southern thorn forest	Indian elephant, sloth bear, panther, cheetal, chowsingha, sambar, porcupine, wild boar, jungle cat, jackal, jungle fowl and slender loris
Sri Venkateshwara Sanctuary, and National Park, Chittoor and Cuddapah districts	506	Dry deciduous with patches of moist deciduous	Endemic floral species - Red sanders, Endangered - *Cycas beddomi* Animals found are panther, sloth bear, sambar, cheetal, mouse deer, barking deer, chowsingha, wild boar, hyena, jackal, fox, civet cat. Endangered species - golden gecko, slender loris, giant squirrel, tree shrew and flying lizard
Kasu Brahmananda Reddy National Park	1.45	Southern tropical dry deciduous (last representative of endemic flora of Hyderabad)	Cheetal, jackals, mongooses, wild boars. Over 100 bird species 20 reptiles, and 15 butterfly species.
Mrughavani National Park, Hyderabad	3.6	Southern tropical deciduous	Has few endemic plant species, mammals like wild boar, jungle cat, civet cat, mongoose, monitor lizard, python, russels viper, cobra, grey pelican, grey partridges, quail, cheetal, sambar and butterflies.
Mahavir Harin, Vanasthali National Park, Hyderabad	14.56	Dry scrub jungle with grasslands	Black buck, cheetal, wild boar and small mammals, reptiles and over 100 bird species.

Implications for the CIF sub-project context
Andhra Pradesh has 20 wildlife sanctuaries and four national parks. Of the four national parks three are clustered around the city of Hyderabad and one is the core area of the Sri Venkateshwara Wildlife Sanctuary and National Park. In this context it is important to note that wildlife sanctuaries, more than national parks, are the focus in terms of protected area issues in the APRPRP. Certain degree of human interference is permitted in sanctuaries. The key management question in APRPRP in the context of protected areas will be how the legal rights of the communities can be provided for without compromising on the conservation of the protected areas.

1.8 Sub-project Types

The APRPRP will provide assistance to communities and groups so that they may be in a better position to take advantage of non-farm employment opportunities such as microenterprises, livestock development, value addition to farm produce, trading, etc. As access to funds through formal channels remains one of the major constraints to reducing income poverty, the APRPRP provides for a Community Investment Fund (CIF). The CIF is a catalyst for those activities that cannot be funded through existing sources in the short run.

The activities to be financed under the CIF would be demand-driven sub-projects to be proposed by the SHGs either on their own (through the Village Organization) or jointly with communities (Gram Sabha / Panchayat) or the line departments, during the course of project implementation. The SHGs would, based mostly on the analysis of the livelihoods of the member-communities, in terms of their skills, resources, income-expenditure patterns and value-chains and the scanning of the new livelihood opportunities, prepare sub-project proposals.

These sub-projects basically meet the criteria of productivity (quantitative/qualitative/ economic), equity (economic, gender, child and environment) and sustainability (of benefit flow). These sub-projects are further appraised independently for their meeting the sub-project criteria including technical feasibility, economic viability, institutional capability etc. APRPRP would provide technical and facilitation support to the sub-projects at every stage of the sub-project evolution, implementation and afterwards.

For the communities to seize livelihood opportunities, there is also a need for pro-active experiments, demonstrations and trials in the key livelihood sub-sectors pertinent to the poor. APRPRP shall make investments in taking up pilot projects on the livelihood areas, including those that demonstrate environmentally sustainable livelihood enhancement.

The CIF sub-projects will not exceed a budget of $ 30,000 (about Rupees 15,00,000). The average value of each sub-project would be about $ 20,000 (about Rupees 10,00,000).

Based on the APDPIP experience, a brief on the sub-projects that could emerge from the APRPRP is provided (this is an indicative and not an exclusive list):

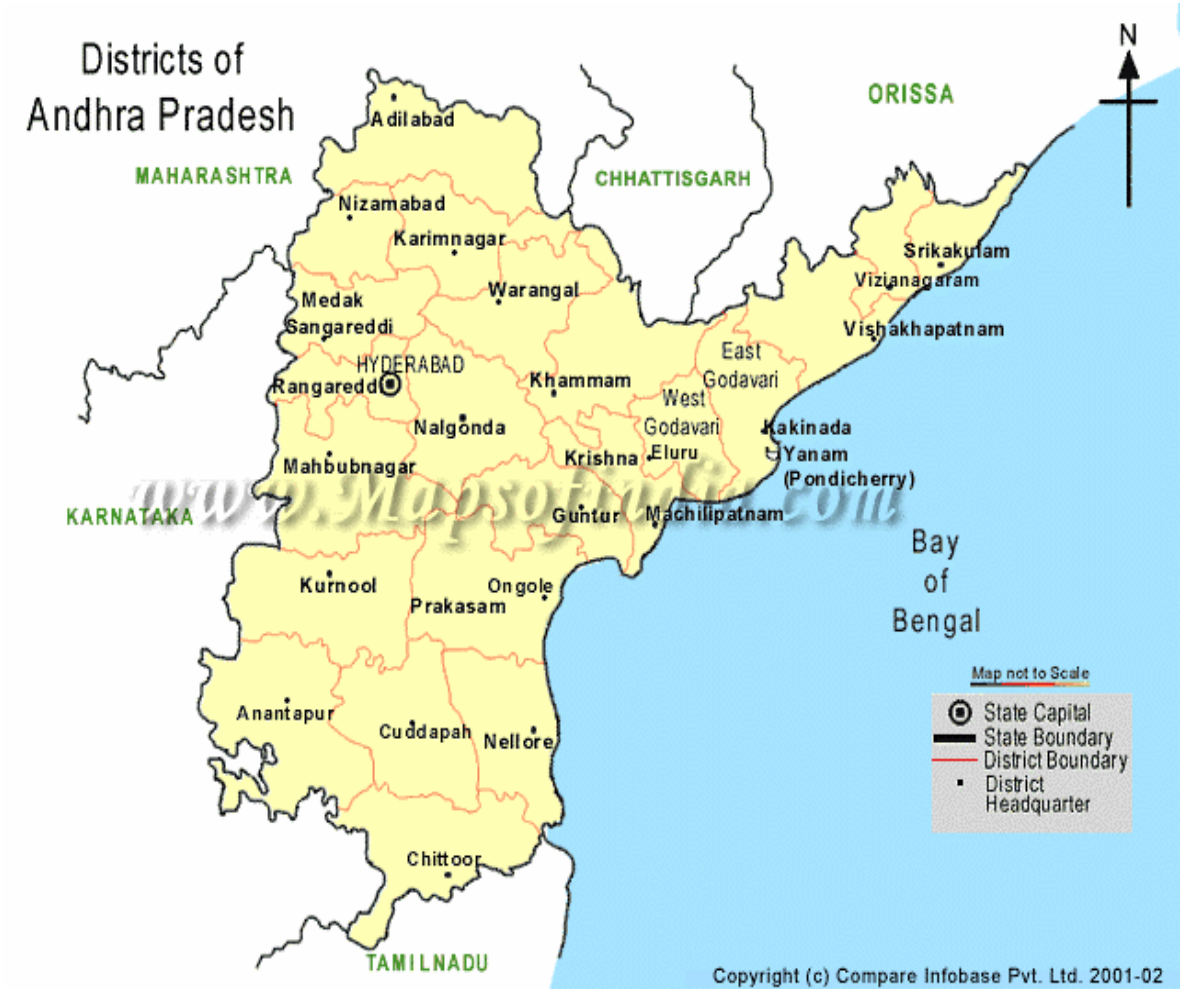
S. No.	*Category*	*Sub-project*	*Brief Description*
1	Livestock	Dairy	Fodder sources are multiple including crop residues, open grazing, cultivated fodder and concentrates (depending on availability). Shelter may or may not be present. Dung is used as manure.
		Sheep rearing	Fodder source is open grazing. In some cases shelter construction and use of dung through composting is practiced.
		Goat rearing	Fodder source is open grazing.
		Poultry	Backyard poultry keeping.
2	Irrigation	Bore well	For irrigation where surface water for agriculture is not adequate. Distance between bore wells is not necessarily more than 200 metres.
		Farm pond	Creation of a pond (or maintenance of existing pond) to store surface water for irrigation. Renovation of open wells also feature as sub-projects.
		Desilting tank	Desilting of irrigation tank to increase water-holding capacity. Silt is used to fertilize farmlands.
3	Agriculture	Crop cultivation (ground nut, paddy)	Chemical pesticides are not used. Chemical fertilizers are used along with organic (Farm yard manure), silt, etc. Bore well irrigation may be practiced (depending on situation). Soil moisture conservation practices are also adopted. Cotton cultivation, which involves heavy pesticide use, may be a significant sub-project area in APRPRP.
		Horticulture, Vegetable farming	Bore well irrigation may be practiced (depending on situation). Organic manure being used. Vegetable cultivation is also a sub-project area.
		Land development	Levelling, clearing rocks, removal of weeds and shrubs, bore well digging, soil moisture conservation measures on land allotted as agricultural land (*patta* land).

		Pisciculture	Stocking of village pond with fingerlings and providing feed inputs (rights are bought through auction).
4	Forest products	Non Timber Forest Produce collection	Includes training on collection practices (sustainability and quality) and marketing intervention. Products collected include leaves (adda leaves, beedi leaves), flowers (mahua), fruits/seeds (tamarind, neem, amla, pongam), gum (gum karaya) and lac.
5	Construction	Shed for cattle	Community sheds (cattle, sheep). Use of manure and cleaning of sheds practiced.
		Check dam	Within 10 metres in height.
		Drying platform	Construction of platform for drying NTFP, crop produce, etc. Platform made of bricks and cement (few square metres in area).
6	Microenterprises	Catering (Mess)	Cooking and supply of food (usually for training programmes, events, etc).
		Crafts	Baskets, fish traps, etc. from bamboo, palm, purchased from market.
		Pottery	Interventions in making (improvised potters' wheels) and in marketing of pots. Combination of fuel wood (gathered and purchased) and rice husk (purchased) are used. Source of clay is tank bed.
		Garment making	Making and marketing ready-made garments. Tailoring unit, training and marketing are interventions.
		Brick making	Source of soil is tank bed or land leased by owners for soil to be taken to help in land levelling. Fuel wood (gathered and purchased) and rice husk (purchased) are used.
		Animal skin and carcass processing	Deskinning animal carcasses, curing the skins using traditional means and marketing (small scale operation). In some cases involves processing of carcasses – meat drying, bone cleaning, fat seperation and sale of the same

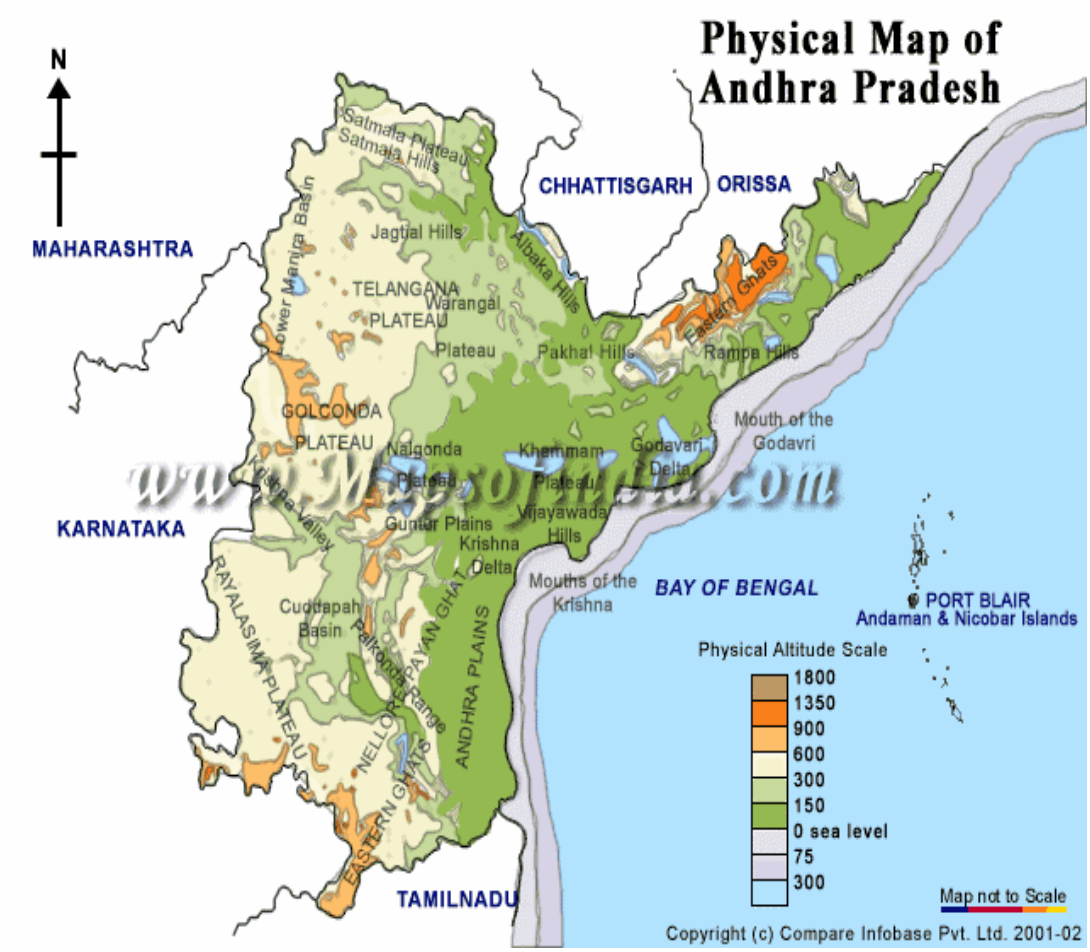
		Marketing interventions	Collective marketing of crop produce, NTFP, crafts, etc. Purchase of weights and measuring instrument is also a sub-project.
7	Others	Skill development training	Training in NTFP collection, tailoring, craft, etc.
		Rice credit	Credit facility for rice.
		Schools (day and residential)	Regular and bridge schools organized in rented premises.

Annexure 1.1 Map depicting location of Andhra Pradesh in India

Annexure 1.2 Map depicting districts of Andhra Pradesh



Annexure 1.3 Physical Map of Andhra Pradesh



Annexure 1.4 List of Grey and Dark mandals of the APRPRP mandals
The list if currently under revision by the Groundwater Department, Government of Andhra Pradesh

District	**Dark Mandals**	**Grey Mandals**	**White Mandals**
East Godavari	Rajanagaram Gandepalli Ragampeta Jaggampeta Prathipadu	Maredumilli Gangavaram Thondangi Korukonda Tuni Addateegala Yeleswaram Rajavommangi Sankhavaram Y. Ramavaram Kotananduru Rampachodavaram Devipatnam Gokavaram	Tallarevu Upparlanka Kajuluru Karapa
Cuddapah	Pendlimarri Vempalli Yerraguntla Kamalapuram	Kondapuram Chinnamandam Mydukur	Atloor Badvel Chakrayapet Chitvel Duvvur Galiveedu Gopavaram Kalasapadu Kodur L. R. Palli Muddanur Mylavaram Nandalur Obulavaripalli Peddamudiyam Pengalur Porumamilla Pullampeta Rayampet Rajupalem Ramapuram Sambepalli T. Sundupalli Thondur Vallur Veeraballi Vemula Vontimitta

District	Dark Mandals	Grey Mandals	White Mandals
Warangal	Bachannapet Cherial Jangaon Maddur Zaffargadh	Chityal Devaruppula Geesugonda Ghanpur Station Lingala Ghanpur Nallabelli Narmetta Rayaparthy Thorrur Wardhannapet	Dharmasagar Hanamkonda (rural) Kesamudram Maripeda Nekkonda Parvathagiri Regonda Mangapet Bhupalapally Dornapal Hasanparthy Kodapandla Mulug Narsampet Nellipudur Ragunathpally Sangam Kothagudam Chennapaopet Eturnagaram Gudur Korivi Mahabubabad Narsimhula Palapurthy Thdavai

District	Dark Mandals	Grey Mandals	White Mandals
Medak	Mirdoddi Gajwel Doulthabad Tupran Ramayampet Nanganur	Jinnaram Kangthi Kalher Kulcharam Medak Manoor Chinnakodur Jagdevpur Andole Nyalkal Jharasangam Zaheerabad Kohir Pulkal Sadashivpet Kowdapur Sangareddy Hatnoora Narsapur Shivampet Wargal Shankaramper (R)	Regode Alladurg Tekmal Raikode Munipally RC Puram Shankarampeta (A) Narayankhed

District	Dark Mandals	Grey Mandals	White Mandals
Khammam	Tirumalayapalem	Kusumanchi Dammapet Khamman (rural) Khamman (urban)	Cherla Dummugudem Bonakal Mudigonda Chinthakani Velairpad Penuballi Sathupalle Enkuru Yerrupalem Vemsoor Kothagudem Burgampadu Mulakalapalle Madhira Aswaraopeta Tekulapalle Kukunoor Wazeed Venkatapuram Pinapaka Gundala Manugur Aswapuram Bhadrachalam Kunavaram Chintur Vararamachand Yellandu Singareni Bayyaram Garla Kamepalle Julurpad Chandrugonda Palavancha

District	Dark Mandals	Grey Mandals	White Mandals
Nalgonda	Marriguda Rajapet Chityal Nuthankal Kethepally Nakrekal Alair Kangal Narketpally Munugode		Anumula Vemulapalle Gundlapalle Munagala Penpahad Valigonda Ramannapeta Chivvemla Atmakur (M) Bommalaramara M. Turka Palle Yadagirigutta Gundala Thirumalagiri Thungathurthi Atmakur (S) Jajireddigude Sali Gouraram Mothkur Pochampalle Kattangoor Mothey Thiparthi Narayanpur Chandur Peddavoora Pedda Adiserl Gurrampode Nampalle Chinthapalle Devarakonda Chandampet Damercherla Tripuraram Nadigudem

Annexure 1.5 Overview of the 16 APRPRP Districts

DISTRICT: CUDDAPAH
Headquarters: Cuddapah

	Unit		Census
Area	Sq.km.	15359.00	1991
Population	'000	2267.77	"
Urban	'000	544.97	"
Rural	'000	1722.80	"
Population Growth (p.a)	%	1.73	"
Population Density (Person/Sq.Km)	Nos.	148.00	"
Urbanisation	%	24.03	"
Agriculture & allied activities	%	71.76	"
Mining & Quarrying	%	0.53	"
Mfg. (Non-household) industries	%	4.02	"
Household industries	%	3.94	"
Forest Area as % of reporting area	%	32.83	97-98
Gross irrigated area as % of gross cropped area	%	40.20	"
Per capita food grain production	Kg.	57.00	"

MAJOR CROPS 1997-98

C R O P	Area as % ofDistrict total	Quantity (In '000 Tonnes)	
Rice	15.33	105	97-98
Jowar	2.51	11	"
Cotton *	3.27	17	"
Turmeric	0.5	15	"
Maize	N	N	"
Arhar	1.51	1	"
Chillies	0.75	4	"
Sugar cane	N	19	"
Sesame	0.75	1	"

* (Lint '000 bales of 170 Kgs) N=Negligible

Major Mineral Production

Mineral	Quantity (Tonnes)	Value (mln)	
Limestone	2494000	165.9	96-97
Kaolin	19570	1	"

DISTRICT: KURNOOL
Headquarters:Kurnool

	Unit		Census
Area	Sq.km.	17658.00	1991
Population	'000	2973.02	"
Urban	'000	768.10	"
Rural	'000	2204.92	"
Population Growth (p.a)	%	2.35	"
Population Density (Person/Sq.Km)	Nos.	168.00	"
Urbanisation	%	25.84	"
Agriculture & allied activities	%	75.17	"
Mining & Quarrying	%	1.80	"
Mfg. (Non-household) industries	%	3.80	"
Forest Area as % of reporting area	%	18.07	1997-98
Gross irrigated area as % of gross cropped area	%	20.93	"
Value of output of major crops			
Per capita food grain production	Kg.	126.00	"

MAJOR CROPS 1997-98

C R O P	Area as % of District total	Quantity (In '000 Tonnes)	
Rice	8.13	201	97-98
Jowar	13.45	118	"
Cotton *	9.76	117	"
Turmeric	0.11	5	"
Maize	0.11	2	"
Arhar	2.28	6	"
Chillies	0.87	8	"
Sugar cane	N	10	"

* (Lint '000 bales of 170 Kgs) N=Negligible

Major Mineral Production

Mineral	Quantity (Tonnes)	Value (mln)	
Limestone	798000	37.6	96-97

DISTRICT - EAST GODAVARI
Headquarters - Kakinada

	Unit		Census
Area	Sq.km.	10807	1991
Population	'000	4541.22	"
Urban	'000	1080.8	"
Rural	'000	3460.62	"
Population Growth (p.a)	%	2.27	"
Population Density (Person/Sq.Km)	Nos.	420	"
Urbanisation	%	23.8	"
Agriculture & allied activities	%	67.88	"
Mining & Quarrying	%	0.23	"
Mfg. (Non-household) industries	%	5.26	"
Household industries	%	3.25	"
Forest Area as % of reporting area	%	29.85	"
Gross irrigated area as % of gross cropped area	%	60.98	"
Value of output of major crops			
Per capita food grain production	Kg.	218	"

MAJOR CROPS 1997-98

C R O P	Area as % of District total	Quantity (In '000 Tonnes)	Value as % of District Total	
Rice	51.47	921		1997-98
Jowar	0.14	1		"
Cotton *	1.4	24		"
Turmeric	N	1		"
Maize	0.84	17		"
Arhar	0.28	N		"
Chillies	0.28	3		"
Sugar cane	2.24	1197		"
Sesame	0.56	1		"

* (Lint '000 bales of 170 Kgs) N=Negligible

Major Mineral Production

Mineral	Quantity (Tonnes)	Value (mln)	
Kaolin	2425	0.3	96-97
Fire Clay	26859	2.4	"

DISTRICT: GUNTUR
Headquarters: Guntur

	Unit		Census
Area	Sq.km.	11391.00	1991
Population	'000	4106.99	"
Urban	'000	1186.70	"
Rural	'000	2920.29	"
Population Growth (p.a)	%	1.96	"
Population Density (Person/Sq.Km)	Nos.	361.00	"
Urbanisation	%	28.90	"
Agriculture & allied activities	%	73.29	"
Mining & Quarrying	%	0.54	"
Mfg.(Non-household) industries	%	5.35	"
Household industries	%	1.21	"
Forest Area as % of reporting area	%	14.30	97-98
Gross irrigated area as % of gross cropped area	%	44.31	"
Value of output of major crops			
Per capita food grain production	Kg.	249.00	"

MAJOR CROPS 1997-98

C R O P	Area as % of District total	Quantity (In '000 Tonnes)	Value as % of District Total	
Rice	36.61	897		97-98
Jowar	0.36	4		"
Cotton *	19.19	433		"
Turmeric	0.47	24		"
Maize	0.83	22		"
Arhar	3.55	16		"
Chillies	3.32	98		"
Sugar cane	0.24	110		"
Sesame	0.59	1		"

* (Lint '000 bales of 170 Kgs) N=Negligible

Major Mineral Production

Mineral	Quantity (Tonnes)	Value (mln)	
Limestone	2171000	143.98	96-97

DISTRICT: KHAMMAM
Headquarters: Khammam

	Unit		
Area	Sq.km.	16029.00	Census 1991
Population	'000	2215.81	"
Urban	'000	448.16	"
Rural	'000	1767.65	"
Population Growth (p.a)	%	2.65	"
Population Density (Person/Sq.Km)	Nos.	138.00	"
Urbanisation	%	19.39	"
Agriculture & allied activities	%	76.83	"
Mining & Quarrying	%	3.18	"
Mfg. (Non-household) industries	%	3.39	"
Household industries	%	1.92	"
Forest Area as % of reporting area	%	47.06	1997-98
Gross irrigated area as % of gross cropped area	%	39.41	"
Value of output of major crops			
Per capita food grain production	Kg.	177.00	"

MAJOR CROPS 1997-98

C R O P	Area as % of District total	Quantity (In '000 Tonnes)	
Rice	29.28	269	97-98
Jowar	5.63	18	"
Cotton *	15.99	89	"
Turmeric	N	1	"
Maize	5.63	73	"
Arhar	5.86	8	"
Chillies	4.05	44	"
Sugar cane	0.45	173	"
Sesam	2.03	1	"

* (Lint '000 bales of 170 Kgs) N=Negligible

Major Mineral Production

Mineral	Quantity (Tonnes)	Value	
Coal	10762000		1996-97

DISTRICT: KRISHNA
Headquarters: Machilipatnam

	Unit		Census
Area	Sq.km.	8727	1991
Population	'000	3698.83	"
Urban	'000	1324.95	"
Rural	'000	2373.88	"
Population Growth (p.a)	%	21.33	"
Population Density (Person/Sq.Km)	Nos.	424	"
Urbanisation	%	35.82	"
Agriculture & allied activities	%	66.18	"
Mining & Quarrying	%	0.45	"
Mfg. (Non-household) industries	%	6.18	"
Household industries	%	2.39	"
Forest Area as % of reporting area	%	7.5	97-98
Gross irrigated area as % of gross cropped area	%	62	"
Value of output of major crops			
Per capita food grain production	Kg.	321	"

MAJOR CROPS 1997-98

C R O P	Area as % of District total	Quantity (In '000 Tonnes)	
Rice	53.43	1093	97-98
Jowar	0.43	2	"
Cotton *	3.71	63	"
Turmeric	0.29	9	"
Maize	1.14	19	"
Arhar	1.57	3	"
Chillies	1	18	"
Sugar cane	2.29	1634	"
Sesame	0.29	N	"

* (Lint '000 bales of 170 Kgs) N=Negligible

Major Mineral Production

Mineral	Quantity (Tonnes)	Value (mln)	
Limestone	1632000	173.6	1996-97

District: MEDAK

Headquarters: Sangareddy

	Unit		Census
Area	Sq.km.	9699.00	1991
Population	'000	2269.80	"
Urban	'000	328.49	"
Rural	'000	1941.31	"
Population Growth (p.a)	%	2.56	"
Population Density (Person/Sq.Km)	Nos.	234.00	"
Urbanisation	%	14.47	"
Agriculture & allied activities	%	78.11	"
Mining & Quarrying	%	0.52	"
Mfg. (Non-household) industries	%	6.94	"
Household industries	%	2.80	"
Forest Area as % of reporting area	%	9.96	1997-98
Gross irrigated area as % of gross cropped area	%	29.48	"
Value of output of major crops			
Per capita food grain production	Kg.	160.00	"

MAJOR CROPS 1997-98

C R O P	Area as % of District total	Quantity (In '000 Tonnes)	
Rice	16.16	135	1997-98
Jowar	22.05	51	"
Cotton *	2.84	13	"
Turmeric	0.22	6	"
Maize	15.50	158	"
Arhar	2.18	N	"
Chillies	2.18	7	"
Sugar cane	3.93	1319	"
Sesame	0.44	N	"

* (Lint '000 bales of 170 Kgs) N=Negligible

DISTRICT: NALGONDA
Headquarters: Nalgonda

	Unit		Census
Area	Sq.km.	14240	1991
Population	'000	2852.09	"
Urban	'000	338.45	"
Rural	'000	2513.64	"
Population Growth (p.a)	%	2.51	"
Population Density (Person/Sq.Km)	Nos.	200	"
Urbanisation	%	11.87	"
Agriculture & allied activities	%	0.34	"
Mining & Quarrying	%	4.13	"
Mfg. (Non-household) industries	%	5.3	"
Household industries	%	1.51	"
Forest Area as % of reporting area	%	44.62	
Value of output of major crops			
Per capita food grain production	Kg.	61.58	1996-97

MAJOR CROPS 1997-98

C R O P	Area as % of District total	Quantity(In '000 Tonnes)	
Rice	36.81	520	1997-98
Jowar	5.56	11	"
Cotton *	8.85	65	"
Maize	0.35	7	"
Arhar	4.51	3	"
Chillies	0.87	10	"
Sugar cane	N	19	"
Sesame	1.04	N	"

* (Lint '000 bales of 170 Kgs) N=Negligible

Major Mineral Production

Mineral	Quantity (Tonnes)	Value (mln)	
Limestone	6271000	396.4	96-97

DISTRICT: NELLORE
Headquarters: Nellore

	Unit		Census
Area	Sq.km.	13076.00	1991
Population	'000	2392.26	"
Urban	'000	569.06	"
Rural	'000	1823.20	"
Population Growth (p.a)	%	1.87	"
Population Density (Person/Sq.Km)	Nos.	183.00	"
Urbanisation	%	23.79	"
Agriculture & allied activities	%	71.82	"
Mining & Quarrying	%	0.40	"
Mfg. (Non-household) industries	%	4.07	"
Household industries	%	2.97	"
Forest Area as % of reporting area	%	18.77	97-98
Gross irrigated area as % of gross cropped area	%	84.76	"
Value of output of major crops			
Per capita food grain production	Kg.	286.00	"

MAJOR CROPS 1997-98

C R O P	Area as % of District total	Quantity (In '000 Tonnes)	Value as % of District Total	
Rice	69.99	672		97-98
Cotton *	2.49	21		"
Arhar	0.28	N		"
Chillies	0.83	6		"
Sugar cane	1.66	446		"
Sesame	0.83	N		"

* (Lint '000 bales of 170 Kgs) N=Negligible

District - PRAKASAM
Headquarters: Ongole

	Unit		
Area	Sq.km.	17626.00	Census 1991
Population	'000	2759.17	"
Urban	'000	453.90	"
Rural	'000	2305.26	"
Population Growth (p.a)	%	1.84	"
Population Density (Person/Sq.Km)	Nos.	157.00	"
Urbanisation	%	16.45	"
Agriculture & allied activities	%	79.44	"
Mining & Quarrying	%	0.32	"
Mfg. (Non-household) industries	%	3.37	"
Household industries	%	2.50	"
Forest Area as % of reporting area	%	25.85	1997-98
Gross irrigated area as % of gross cropped area	%	36.36	"
Value of output of major crops			
Per capita food grain production	Kg.	154.00	"

MAJOR CROPS 1997-98

C R O P	Area as % of District total	Quantity(In '000 Tonnes)	
Rice	25.76	346	1997-98
Jowar	1.52	10	"
Cotton *	7.58	48	"
Turmeric	N	1	"
Maize	1.33	26	"
Arhar	6.63	2	"
Chillies	2.08	14	"
Sugar cane	N	27	"
Sesame	1.33	1	"

* (Lint '000 bales of 170 Kgs) N=Negligible

DISTRICT: RANGAREDDY
Headquarters: Hyderabad

	Unit		Census
Area	Sq.km.	7493.00	1991
Population	'000	2551.97	"
Urban	'000	1205.18	"
Rural	'000	1346.79	"
Population Growth (p.a)	%	6.13	"
Population Density (Person/Sq.Km)	Nos.	340.00	"
Urbanisation	%	47.22	"
Agriculture & allied activities	%	55.78	"
Mining & Quarrying	%	1.55	"
Mfg. (Non-household) industries	%	13.84	"
Household industries	%	1.00	"
Forest Area as % of reporting area	%	9.69	1997-98
Gross irrigated area as % of gross cropped area	%	25.26	"
Value of output of major crops			
Per capita food grain production	Kg.	81.00	"

MAJOR CROPS 1997-98

C R O P	Area as % of District total	Quantity(In '000 Tonnes)	
Rice	14.04	92	97-98
Jowar	26.32	78	"
Cotton *	7.72	22	"
Turmeric	1.40	21	"
Maize	2.11	15	"
Arhar	9.82	1	"
Chillies	1.05	4	"
Sugar cane	N	40	"
Sesame	0.70	N	"

* (Lint '000 bales of 170 Kgs) N=Negligible

Major Mineral Production

Mineral	Quantity (Tonnes)	Value (mln)	
Limestone	717000	36.7	97-98

DISTRICT: VISAKHAPATNAM
Headquarters: Visakhapatnam

	Unit		Census
Area	Sq.km.	11161	1991
Population	'000	3285.09	"
Urban	'000	1308.58	"
Rural	'000	1976.51	"
Population Growth (p.a)	%	2.75	"
Population Density (Person/Sq.Km)	Nos.	294	"
Urbanisation	%	39.83	"
Agriculture & allied activities	%	62.24	"
Mining & Quarrying	%	0.47	"
Mfg. (Non-household) industries	%	6.48	"
Household industries	%	2.65	"
Forest Area as % of reporting area	%	42.15	97-98
Gross irrigated area as % of gross cropped area	%	35.77	"
Value of output of major crops			
Per capita food grain production	Kg.	44	"

MAJOR CROPS 1997-98

C R O P	Area as % of District total	Quantity (In '000 Tonnes)	
Rice	24.09	89	97-98
Jowar	0.24	1	"
Cotton *	0.24	4	"
Turmeric	0.24	1	"
Maize	1.46	8	"
Arhar	1.22	1	"
Chillies	1.22	10	"
Sugar cane	9.73	1637	"
Sesame	3.16	2	"

* (Lint '000 bales of 170 Kgs) N=Negligible

Major Mineral Production

Mineral	Quantity (Tonnes)	Value (mln)	
Kaolin	154	0.02	1996-97

DISTRICT: WEST GODAVARI
Headquarters: Eluru

	Unit		Census
Area	Sq.km.	7742.00	1991
Population	'000	3517.57	"
Urban	'000	728.55	"
Rural	'000	2789.02	"
Population Growth (p.a)	%	2.24	"
Urbanisation	%	454.00	"
Agriculture & allied activities	%	71.98	"
Mining & Quarrying	%	0.20	"
Mfg. (Non-household) industries	%	5.10	"
Household industries	%	2.21	"
Forest Area as % of reporting area	%	10.38	97-98
Gross irrigated area as % of gross cropped area	%	86.52	"
Value of output of major crops			
Per capita food grain production	Kg.	383.00	"

MAJOR CROPS 1997-98

C R O P	Area as % of District total	Quantity (In '000 Tonnes)	
Rice	65.87	1308	1997-98
Cotton *	0.6	8	"
Turmeric	N	2	"
Maize	1.35	35	"
Arhar	0.15	N	"
Chillies	0.75	10	"
Sugar cane	4.04	2157	"
Sesame	0.3	1	"

* (Lint '000 bales of 170 Kgs) N=Negligible

Major Mineral Production

Mineral	Quantity (Tonnes)	Value (mln)	
Limestone	1000	12.9	96-97
Kaolin	36593	36.92	"

DISTRICT: WARANGAL

Headquarters: Warangal

	Unit		Census
Area	Sq.km.	12846	1991
Population	'000	2818.83	"
Urban	'000	546.62	"
Rural	'000	2272.21	"
Population Growth (p.a)	%	2.25	"
Population Density (Person/Sq.Km)	Nos.	219	"
Urbanisation	%	19.39	"
Agriculture & allied activities	%	75.55	"
Mining & Quarrying	%	0.48	"
Mfg. (Non-household) industries	%	5.05	"
Household industries	%	3.54	"
Forest Area as % of reporting area	%	28.69	97-98
Gross irrigated area as % of gross cropped area	%	52.02	"
Value of output of major crops			
Per capita food grain production	Kg.	117	"

MAJOR CROPS 1997-98

C R O P	Area as % of District total	Quantity (In '000 Tonnes)	
Rice	17.49	180	97-98
Jowar	5.83	20	"
Cotton *	22.65	132	"
Turmeric	1.35	23	"
Maize	10.31	119	"
Arhar	2.69	2	"
Chillies	5.16	33	"
Sesame	4.26	2	"

* (Lint '000 bales of 170 Kgs) N=Negligible

Chapter 2

Policy, Legal and Regulatory Framework

2.1 Introduction

It is important that the sub-projects that will emerge from the APRPRP are in tune with the legal framework in the country and state. The existing laws and regulations concerning environmental conservation may restrict certain developmental activities. On the other hand, they may also provide opportunities for good environmental management in the sub-project context. This section presents the laws and regulations relevant to the CIF sub-project context.

It is important that the EMF remain responsive to the changing legal framework. To ensure this, the EMF has to integrate mechanisms for constant monitoring and revision of this component. A mechanism for doing this, the Environment Monitor, has been integrated in the EMF.

The following laws, regulations and policies have been reviewed in this chapter for their relevance to the CIF sub-project context.

Relevant Central Government Laws and Regulations

Environmental Impact Assessment Notification, 1994
Wildlife (Protection) Act, 1972
Coastal Regulation Zone Notification, 1991
The Insecticide Act, 1968 and the Insecticide Rules, 1971

Relevant State Government Laws and Regulations

The Andhra Pradesh Forest Act 1967
Andhra Pradesh Protected Forest Rules, 1970
The Andhra Pradesh Water, Land and Trees Act, 2002 and the Andhra Pradesh Water, Land and Trees Rules, 2002
The Andhra Pradesh Saw Mills (Regulation) Rules, 1969
Andhra Pradesh Forest Produce Transit Rules, 1970
The Andhra Pradesh Minor Forest Produce (Regulation of Trade) Act, 1971
The Andhra Pradesh Scheduled Areas Minor Forest Produce (Regulation of Trade) Regulation, 1979
The Andhra Pradesh Preservation of Private Forest Rules, 1978
Andhra Pradesh (Protection of Trees and Timber in Public Premises) Rules, 1989
The Andhra Pradesh Charcoal (Production and Transport) Rules, 1992

Operational Policies of The World Bank

OP 4.01 Environmental Assessment
OP 4.36 Forestry
OP 4.04, OP 4.04 a, BP 4.04 Natural Habitats
OP 4.09 Pest Management
OP 4.37 Safety of Dams
OD 4.30 Involuntary Resettlement
OP 4.11 Cultural Property
OD 4.20 Indigenous Peoples

2.2 Environmental Impact Assessment Notification, 1994

This notification makes Environment Impact Assessment statutory for:

- 29 different identified industrial activities (in two categories of investments – Rupees 5 crore and Rupees 1 crore),
- for site specific projects such as mining, pit-head thermal power stations, hydropower, major irrigation projects, ports and harbours,
- for all development projects located in areas notified by the Government of India as ecologically sensitive/fragile areas.

Applicability to the CIF sub-project context:

- None of the 29 identified industrial activities will feature as CIF sub-projects in view of their nature and investment requirements
- No site-specific project will feature as a CIF sub-project in view of the nature and scale (mining involving more than 5 ha, thermal power stations of more than Rupees 50 crore investment, river valley projects with more than Rupees 50 crore investment, tourism projects in coastal and high altitude zones with investment of more than Rupees 5 crore)
- Applicability in relation to the ecologically sensitive/fragile areas is discussed in the context of the Wildlife (Protection) Act, 1972 and the Coastal Regulation Zone Notification, 1991.

2.3 The Wildlife (Protection) Act, 1972

2.3.1 Sanctuaries

The State Government may, by notification, declare its intention to constitute any area as a sanctuary if it considers that such area is of adequate ecological, faunal, floral, geomorphological, natural or zoological significance, for the purpose of protecting, propagating or developing wildlife or its environment.

The Collector shall enquire into and determine the existence, nature and extent of rights of any person in or over the land comprised within the limits of the sanctuary.

After the issue of such a notification, no right shall be acquired in, or over the land comprised within the area except by succession, testamentary or intestate.

If a claim is made to a right in or over any of such land and if the claim is admitted, the Collector may exclude the lands from the limits of the sanctuary, acquire the land or rights, or allow, in consultation with the Chief Wild Life Warden, the continuances of any right of any person in or over any land within the limits of the sanctuary.

In the case of the stoppage of a public way or common pasture, the Collector may, with the previous sanction of the State Government, provide for an alternative public way or common pasture, as far as may be practicable or convenient.

No person other than the following shall enter or reside in a sanctuary:

- A public servant on duty
- A person (and this person's dependants) who has been permitted by the Chief Wild Life Warden to reside within the limits of the sanctuary
- A person (and this person's dependants) who has any right over immovable property within the limits of the sanctuary
- A person passing through the sanctuary along a public highway

No person shall destroy, exploit or remove any wildlife from a sanctuary or destroy or damage the habitat of any wild animal or deprive any wild animal of its habitat within such sanctuary except under and in accordance with a permit granted by the Chief Wild Life Warden and no such permit shall be granted unless the State Government, being satisfied that such destruction, exploitation or removal of wildlife from the sanctuary is necessary for the improvement and better management of wildlife therein, authorizes the issue of such permit.

No person shall set fire to a sanctuary, or kindle any fire or leave any fire or leave any fire burning in a sanctuary, in such manner as to endanger such sanctuary.

No person shall use in a sanctuary, chemicals, explosives, or any other substances which may cause injury to, or endanger, any wildlife in such sanctuary.

The Chief Wild Life Warden may regulate, control or prohibit, in keeping with the interests of wildlife, the grazing or movement of livestock.

The Chief Wild Life Warden shall take such measures in such manner, as may be prescribed, for immunization against communicable diseases of the livestock kept in or within five kilometers of a sanctuary. No person shall take, or cause to be taken or grazed, any livestock in a sanctuary without getting it immunized.

2.3.2 National Parks

Whenever it appears to the State Government that an area, whether within a sanctuary or not, is by reason of its ecological, faunal, floral, geomorphological or zoological

association of importance, needed to be constituted as a National Park for the purpose of protecting, propagating or developing wild life therein or its environment, it may, by notification, declare its intention to constitute such area as a National Park.

The Collector shall enquire into and determine the existence, nature and extent of rights of any person in or over the land comprised within the limits of the National Park.

After the issue of such a notification, no right shall be acquired in, or over the land comprised within the area except by succession, testamentary or intestate.

If a claim is made to a right in or over any of such land and if the claim is admitted, the Collector may exclude the lands from the limits of the National Park, acquire the land or rights, or extinguish rights in relation to any land in the area.

No person shall destroy, exploit or remove any wildlife from a National Park or destroy or damage the habitat of any wild animal or deprive any wild animal of its habitat within such National Park except under and in accordance with a permit granted by the Chief Wild Life Warden and no such permit shall be granted unless the State Government, being satisfied that such destruction, exploitation or removal of wildlife from the National Park is necessary for the improvement and better management of wildlife therein, authorizes the issue of such permit.

No grazing of any livestock shall be permitted in a National Park and no livestock shall be allowed to enter therein.

Applicability to the CIF sub-project context:

- Communities living in areas within the limits of the Wildlife Sanctuary, at the time of its notification, may hold certain rights (which do not harm any wildlife or its habitat). These rights (use of land, grazing, etc) have to be exercised with permission from the Collector and the Chief Conservator of Forests.
- No community holds any right (use of land, grazing, etc) inside a National Park.

2.4 Coastal Regulation Zone Notification, 1991

The Government of India declares the coastal stretches of seas, bays, estuaries, creeks, rivers and backwaters which are influenced by tidal action up to 500 metres from the High Tide Line (HTL) and the land between the Low Tide Line (LTL) and the HTL as Coastal Regulation Zone (CRZ) and imposes restrictions on the setting up and expansion of industries, operations or processes, etc., in the CRZ.

Applicability to the CIF sub-project context:
Some of the prohibited activities, which may have implications for the CIF sub-project context are:

- Setting up and expansion of fish processing units including warehousing (excluding hatchery and natural fish drying in permitted areas).
- Discharge of untreated wastes and effluents from industries and human settlements.

- Land reclamation, bunding or disturbing the natural course of sea water with similar obstructions, except those required for control of coastal erosion and maintenance or cleaning of waterways and channels; for prevention of sandbars; and except for structures for prevention of salinity ingress and for sweet water recharge.
- Mining of sands, rocks and other substrata materials, except those raw materials not available outside the CRZ areas.
- Harvesting or withdrawal of ground water and construction of mechanisms for the same within 200 metres of HTL. In the 200 metres to 500 metres zone it shall be permitted only when done manually through ordinary wells for drinking, horticulture, agriculture and fisheries.
- Any construction activity between LTL and HTL (except for those activities permitted under this notification).

2.5 The Insecticide Act, 1968 and the Insecticide Rules, 1971

Any person desiring to manufacture or sell, stock or exhibit for sale or to distribute any insecticide, is required to take a licence. Any person found manufacturing, stocking or selling misbranded insecticides is liable to be punished with imprisonment or fine.

Implications for the CIF context
The list of pesticides classified as hazardous by the World Health Organization's '*Recommended Classification of Pesticides by Hazard and Guidelines to Classification'* (Geneva: WHO 1994-95) as falling in Categories IA, IB and II is provided as part of the Pest Management Plan. Pesticides in these categories are to be avoided in all CIF sub-projects.

2.6 The Andhra Pradesh Forest Act 1967

The Government may constitute any land as reserved forest by publishing a notification in the Andhra Pradesh Gazette and in the District Gazette concerned specifying the details of the land, declaring the proposal to make it reserved forest, and appointing a Forest Settlement Officer to consider the objections against the declaration and to determine and settle the rights claimed to the land or to any forest produce of that land.

During the interval between the publication of a notification in the Andhra Pradesh Gazette and the date fixed in the notification, without the written permission from the Forest Settlement Officer, in the land specified:

- No right shall be acquired by any person in or over the land except by succession or under a grant or contract by the Government or any person who had such a right before the publication of the notification of the land to be Reserved.
- No new house shall be built or plantation formed, no fresh clearing for cultivation or for any other purpose shall be made, and no trees shall be cut for the purpose of trade or manufacture.

Also,
No person shall set fire or kindle or leave burning any fire in such manner as to endanger or damage such land or forest produce.
No *patta* in such land shall be granted by the Government.

If the claim relates to a right of way, right to watercourse or to use of water, right of pasture, or a right to forest produce[1], the Forest Settlement Officer may admit or reject the claim. If the claim is admitted, the Forest Settlement Officer may ensure the continued exercise of the rights subject to certain conditions agreed upon with due regard to the maintenance of the reserved forest.

The following are prohibited in reserved forest (except if the act is done with the written permission of the Divisional Forest Officer or if it is done as part of the exercise of rights ensured by the Forest Settlement Officer):

- Set fire, kindle fire or leave any fire burning in such manner as to endanger such forest
- Kindle, keep or carry any fire except at seasons and conditions specified by the Divisional Forest Officer
- Trespass, pasture cattle or allow cattle to trespass
- Cause any damage, either willfully or negligently in felling or cutting any trees or dragging any timber
- Fell, girdle, lop, tap or burn any tree or strip off the bark or leaves from or otherwise damage the same
- Quarry stone, burn lime or charcoal
- Collect or subject to any manufacturing process, any forest produce
- Clear or break up or plough any land for cultivation or for any other purpose
- Hunt, shoot, fish, poison water or set traps or snares
- Damage, alter or remove any wall, ditch embankment, fence, hedge, or railing, or
- Remove any forest produce

2.6.1 Notifications

G.O.Ms.No.387, Food & Agriculture (Forest III) dated 14-3-1968
From 1-4-1968 free grazing is allowed in the Reserved Forest (excepting plantation areas) throughout the State without any permits. Goat browsing in the Forest areas is however, prohibited.
G.O.Ms.No.273, Food & Agriculture (Forest III) Department dated 19-2-1969

[1] Forest produce includes timber, bamboos, charcoal, rubber, cacutchour, catechu, wood-oil, resin, natural varnish, bark, lac, mahua flowers, mahua seeds, myrobalans, tumki leaves, rousa grass, *Rauwolfia serpentina*, adda leaves, and

- trees, such leaves, flowers and fruits as may be prescribed and all other parts or produce
- plants (including grass, creepers, reeds and moss) and all parts or produce of such plants
- wild animals, wild birds, skins, tusks, horns, bones, silk cocoons, honey, wax, and all other parts and produce of animals and birds
- peat, surface soil, rock and minerals (including limestone and laterite) mineral oil and all products of mines or quarries

G.O.Ms.No.2502, Industries, Cooperation and Labour, dated 16-12-1955
In all the reserved forests and in forests that are open to grazing, goats may be permitted to lead sheep into the forests, as per the following conditions:

- For every flock of sheep 25 and below – no goats
- For every flock of sheep 25 and up to 99 – 2 goats at Rs. 5 each per year
- For every flock of sheep 100 and above – 4 goats at Rs. 5 each per year

Applicability for the CIF sub-project context:
Communities can have certain rights in reserve forest lands (for example, free grazing is permitted in Reserve Forests[2]). Activities such as agriculture, collection of NTFP, stone quarrying, lime or charcoal making are not permitted unless there is written permission from the Divisional Forest Officer (or as part of the settlement with the Forest Settlement Officer). New construction and cultivation is not permitted.

2.7 Andhra Pradesh Protected Forest Rules, 1970

The following are prohibited in a protected forest (except when the act is done in accordance with any Government order or with permission of the Chief Conservator of Forests, Conservator or Forests or Divisional Forest Officer):

- Clearing, ploughing or breaking up of land for cultivation or any other purpose
- Kindling of fire
- Cutting, sawing, conversion and removal of trees and timber and collection and removal of natural produce
- Quarrying of stone, the boiling of catechu or the burning of lime or charcoal
- Cutting of grass, or the pasturing of cattle, and
- Hunting, shooting, fishing, poisoning of water and setting of traps or snares

Persons belonging to scheduled tribes are eligible for the following concessions:
The removal of timber, bamboos, and forest produce from the protected forests for domestic and agricultural purposes on payment of the fee fixed for the purpose
Agricultural purposes includes the use of:

- Timber for agricultural implements
- Poles and thorns for hedges
- Bamboo for fencing and roofing of huts and sheds in fields, and
- Leaves for green manure

Domestic purposes includes the use of:

- Fuel for heating and cooking
- Timber and other forest produce for the erection and repair of permanent and temporary dwellings, cattle sheds, pandals and fencing of compounds and fields

[2] The proposed Grazing Policy currently in discussion seeks to reintroduce the system of permits for grazing livestock.

Applicability to the CIF sub-project context:

- Communities living in areas within the limits of the Wildlife Sanctuary, at the time of its notification, may hold certain rights (which do not harm any wildlife or its habitat). These rights (use of land, grazing, etc) have to be exercised with permission from the Collector and the Chief Conservator of Forests.
- No community holds any right (use of land, grazing, etc) inside a National Park.

Please also refer to Wildlife (Protection) Act, 1972.

2.8 The Andhra Pradesh Water, Land and Trees Act, 2002 and the Andhra Pradesh Water, Land and Trees Rules, 2002

The Andhra Pradesh Land, Water and Trees Act and Rules, 2002 are to promote water conservation and tree cover and to regulate the exploitation and use of ground and surface water for protection and conservation of water sources and land.

State, District and Mandal authorities are constituted under these rules. The Ex-Officio Chairman of the District Authority is the District Collector and the Ex-Officio Member Secretary is the Project Director, Drought Prone Area Programme / District Water Management Agency. The Ex-Officio Chairman of the Mandal Authority is the Mandal Revenue Officer and the Ex-Officio Member Secretary is the Assistant Executive Engineer, Rural Water Supply.

2.8.1 Ground Water Protection Measures

Owners of all wells (including those which are not fitted with power driven pumps) and water bodies in the State shall register their wells/water bodies with the Village Secretaries of the Gram Panchayats.

No person shall sink any well in the vicinity of a public drinking water source within a distance of 250 metres, without permission from the Authority, and if the well is to be used with a power driven pump, without permission from APTRANSCO. Sinking of any well for public drinking purpose and hand pump for public or private drinking water purpose is exempted from this.

In areas declared as overexploited by the Authority, no person shall sink a well without the permission of the Authority.

Every rig owner shall register his machinery with the Authority.

2.8.2 Land and Soil

No brick manufacturing shall be taken up in areas where the soil is prone to erosion and depletion.

Wherever coal based thermal power plants are in operation, all constructions within a radius of 10 kilometres shall be taken up with bricks made only of fly ash.

Sand mining shall not be permitted in I, II and III order streams except for local use in villages or towns bordering the stream. Transportation of sand from these notified I, II and III order streams through mechanical means out of the local jurisdiction shall be banned. In IV order streams, sand mining shall be restricted to specified areas. In V order and above rivers (eg: Godavari, Krishna, Pennar) sand mining may be permitted without affecting existing irrigation, drinking water or industrial uses.

Sand mining shall not be carried out within 500 metres of any existing structure (such as bridges, dams, weirs, or any other cross drainage structure) and within 500 metres of any groundwater extraction structures (either for irrigation or drinking water purposes).

Sand mining shall not be permitted within 15 metres or $1/5^{th}$ of the width of the stream bed from the bank, which ever is more.

In streams and rivers where the thickness of sand is quite good (more than 8 metres), the depth of removal my be extended up to 2 metres. Sand mining shall not be permitted in streams where the thickness of sand deposition is less than 2 metres. In minor streams, where the thickness of sand deposition is more than 3 metres and less than 8 metres, the depth of removal of sand shall be restricted to one metre.

Sand mining shall be restricted to depths above the water table recorded during monsoon and in no case shall effect/disturb the water table.

2.8.3 Surface Water

No undesirable wastes including liquid wastes shall be allowed to be dumped in the water bodies by any person or organization.

2.8.4 Trees

Tree plantation and landscaping shall be adopted in all public and private premises.

No felling of the trees or branches is permitted without prior permission of the Authority.

Compulsory planting in residential areas, commercial/institutional areas and industrial areas as per the following details is to be taken up:

For residential areas with an area of:

Below 100 sq. metres	3 trees
101 to 200 sq. metres	5 trees
201 to 300 sq. metres	10 trees
More than 301 sq. metres	10 trees, plus 5 trees for every increase of 100 sq. metres

For commercial and institutional areas with an area of:

Below 200 sq. metres	2 trees
201 to 500 sq. metres	4 trees
501 to 1000 sq. metres	6 trees, plus 2 trees for every increase of 100 sq. metres

2.9 The Andhra Pradesh Saw Mills (Regulation) Rules, 1969

Saw mill means a mechanical contrivance for sawing, cutting or conversion of timber with the aid of electrical or mechanical power but does not include a contrivance operated solely by manual power.

No person shall install, erect or operate a Saw Mill for cutting, converting or sawing of timber without obtaining a licence for such installation from the Divisional Forest Officer.

No licence for setting up fresh saw mills within a distance of 5 km. from the boundary of any Forest under the control of the Forest Department shall be granted.

Applicability to the CIF sub-project context:
In case a sawmill (as defined under these rules) is proposed, the required licence from the Divisional Forest Officer needs to be taken.

2.10 Andhra Pradesh Forest Produce Transit Rules, 1970

No forest produce shall be moved into or from or within the State by land or water unless such produce is accompanied by a permit.

Timber exceeding 25 cms in girth at its thickest part and one metre in length, except timber sawn into sizes shall not be moved into or from or within the State of Andhra Pradesh, unless such timber bears a distinguishable Government transit mark authorizing the transit. (Firewood means all timber below 25 cms in girth at it thickest end and one metre in length.)

Applicability to the CIF sub-project context:
Sub-projects which involve collective marketing of NTFP will require a permit.

2.11 The Andhra Pradesh Minor Forest Produce (Regulation of Trade) Act, 1971

Minor Forest Produce means any forest produce other than timber, trees (excluding bamboos) and charcoal.

No person other than the Government, or an authorized officer of the Government or an agent appointed by the Government shall sell or purchase or cure or otherwise process or collect or store or transport any minor forest produce. Any sale to or purchase from the Government, the authorized officer or the agent appointed by the Government of a minor forest produce is permitted.

Every grower[3], other than the Government, shall, if the quantity of the minor forest produce grown by him during a year is likely to exceed such quantity as may be prescribed, get himself registered with the Divisional Forest Officer.

A registered grower may collect any minor forest produce from any land belonging to him on which such produce is grown and may transport the minor forest produce to the nearest depot.

No grower shall carry on any trade or business in or any industry with the use of the minor forest produce except in accordance with the provisions of this Act and the rules made thereunder.

Every manufacturer of finished goods using minor forest produce, and every exporter of minor forest produce shall get himself registered.

Applicability to the CIF sub-project context:
Sub-projects which involve collection, processing and marketing of NTFP will require registration with the Divisional Forest Officer.

2.12 The Andhra Pradesh Scheduled Areas Minor Forest Produce (Regulation of Trade) Regulation, 1979

The object and purpose of the Regulation was to create a State monopoly in the trade of minor forest produce in Scheduled Areas through Andhra Pradesh.

No person other than the Girijan Cooperative Corporation, Ltd., shall sell or purchase or cure or otherwise process or collect or store or transport any minor forest produce.

Any sale to or purchase from the Corporation of a minor forest produce is permitted.

Applicability to the CIF sub-project context:
Sub-projects, which involve collection, processing and marketing of NTFP, will require registration with the Girijan Cooperative Coorporation, Ltd.

[3] Grower means –
the Government, in respect of any minor forest produce grown in any land constituted as reserved forest or in any forest or wasteland declared as protected forest
the Government, in respect of minor forest produce grown on unoccupied land which is the property of the Government or which is placed under their control and management
the owner, occupier, tenant, lessee or other person having right to the possession and enjoyment of the land included in a unit, on which the minor forest produce is grown and includes every person, who, from time to time, claims title to such produce through him

2.13 The Andhra Pradesh Preservation of Private Forest Rules, 1978

The Forest area situated in Patta land is a Private Forest.

No permission to fell the following 'prohibited trees' is granted:

1. Vepa (*Azadirachta indica*)
2. Ippa (*Madhuka latifolia*)
3. Mamidi (*Mangifera indica*)
4. Kunkudu (*Sapindus emarginatus*)
5. Mushti (*Strychnos nuxvomica*)
6. Chinta (*Tamarindus indica*)
7. Panasa (*Artocarpus integrifolia* and *Artocarpus hirsuta*)
8. Karaka (*Termalia chebula*)
9. Tuniki (*Diospyros malonaxylon*)
10. Kaniga (*Pongamia glabra*)

Permission to cut the following reserved trees shall not be granted unless the trees exceed 120 cms. in girth at 1.3 mtrs. height from ground level (Also, the felling should be as close to the ground as possible):

1. Bandaru (*Adina cordifolia*)
2. Billudu (*Chloroxylon swietenia*)
3. Jittegi (*Dalbergia latifolia*)
4. Yepi (*Hardwickia binata*)
5. Raktachandanam (*Pterocarpus santalinus*)
6. Yegisa (*Pterocarpus marsupium*)
7. Chandanam (*Santalum album*)
8. Salwa (*Shorea robusta*)
9. Kusum (*Schleichera trijuga*)
10. Teku (*Tectona grandis*)
11. Maddi (*Terminalia tomentosa*)
12. Konda Tangedu (*Xylya dolabriformis*)

2.14 Andhra Pradesh (Protection of Trees and Timber in Public Premises) Rules, 1989

Public premises means any area under the control of Government Department and includes road sides; premises of institutions and public buildings, public gardens, porambokes, beroon lands, Panchayat lands, irrigation project sites and canal banks, tank bunds, tank spread and foreshores, etc.

Unless it is in accordance with any order issued by the Government or with prior written permission of the Forest Officer, the following is not allowed in public premises:

- Felling, girdling, lopping, tapping or burning of any trees

- Stripping off the bark or collecting leaves or otherwise damaging a tree
- Removing any produce from such trees existing in public premises
- Damaging, altering, removing any fence or live hedge fence

Applicability to the CIF sub-project context:
Sub-projects that involve lopping of branches for fodder, collection of bark and leaves (or any other produce) as part of NTFP collection will require written permission from the Forest Officer.

2.15 The Andhra Pradesh Charcoal (Production and Transport) Rules, 1992

No person shall make charcoal, or cut or cause to cut trees for the purposes of making charcoal, without the previous written permission of the Divisional Forest Officer concerned.

Applicability to the CIF sub-project context:
Sub-projects that involve charcoal making will require written permission from the Divisional Forest Officer.

2.16 Guidelines on Minor Irrigation

2.16.1 Draft Guidelines for National Watershed Development Project for Rainfed Areas, Ministry of Agriculture, Government of India

These operational guidelines and regulations are flexible in some instances to some extent so that the desired modifications could be considered at different levels according to the site, climatic, geographic and climatic conditions:

Location of the Minor Irrigation project site should be nearer to the wells and lands owned by poor families.

Willingness by the people to implement all the proposed projects by people themselves with out any contractor.

Willingness by the people to maintain all records properly and take up audit responsibility for the developmental funds to be released under the project.

Necessary sanctions for the proposed site must be taken from the concerned authority. For example, if it is forestland take the permission from the Forest Officer.

The site of the proposed project should be in Low Intensity of Irrigation land (Less than 30 per cent of the cultivated land).

The project should ensure equity for resource-poor families and empowerment of women.

During the implementation of the projects, the implementing agency should ensure equal wage and equal employment opportunities for women.

The project site should be in an area where there has been a significant reduction of the water table in the wells/ bore wells, in over exploited areas with high well density and in areas with drinking water scarcity.

Should check the runoff potential index (Estimation of rainwater flow, this may be calculated through Dickens' formula Q=C*M, Q=Discharge in quesecs, C=constant, M=catchment in square kilometer) for rainwater and other drainage lines in the site and near around. Based on runoff potential one can assess the water storage capacity of water harvest tank or bund in proposed site.

The assessment should consider the degree of land degradation and sedimentation yield through runoff as it reflects the necessity for soil and water conservation.

Before taking up the project, the underground water status in proposed site must be monitored. This will be a base data for the requirement of the project in the proposed site.

2.16.2 Guidelines on Percolation Tanks, Ground Water Department, Ministry of Agriculture, Government of India

The following guidelines should be followed while constructing the percolation and other water harvesting tanks:

The construction of water harvesting tanks should be taken up at a site where it is not possible to construct irrigation canals.

The site should be in high ridges of the drain. Preferably passing through low intensity of land, because the results will have a positive impact on low intensity areas.

The basin of the tank should be in a saucer shape in order to increase the degree of percolation.

There should not be direct drains from water harvesting tanks to irrigation fields, since direct surface irrigation is not envisaged under any water harvesting projects and the purpose of harvesting tanks is to recharge the ground water so that the water level of nearby wells will increase.

The capacity of a tank normally ranges from 1,41,600 cu.mt. to 5,66,400 cu.mt. The capacity in relation to catchment area and rainfall must be properly designed to ensure that they will fill almost ever year.

The zone influence of percolation for a water-harvesting tank is 4 miles with ½ a mile width. Following this one should see that the density of wells shall not be less than 2 wells / sq. km near the site. This leads to the increase in the utility of the project.

The construction of percolation tanks should be avoided in areas where clay soils are predominant, as clay soils have less degree of porosity.

The project should ensure that the site location should not be in steep, narrow valleys with undulating topography as these are not favorable (and not economical) locations for tanks.

Water harvesting tanks should provide the suitable out let at the deepest bed level and it should be insured that the silt depositions are periodically removed, other wise the percolation will be retarded due to silting of bed in course time.

2.16.3 Guidelines on Water Harvesting Dams and Dykes, Ground Water Department, Ministry of Agriculture, Government of India

Narrow gauge of valleys where alluvium exists with flat basement or gentle slopes or shallow basement are desirable to have water harvesting dams and dykes. These will have maximum storage capacity and are economical.

Structural fractures and lineaments etc. in the vicinity of dam site should be examined and such sites should be avoided as the topography of fractures and lineaments are not suitable to construct a dam or dyke.

The post-monsoon ground water levels near the dam site should be deep enough, that is more than 3 meters below ground level.

The chemical composition of ground water in the basin and topography, type of soil, cropping pattern, rainfall in the basin should be discussed with the help of a geologist.

The site should be in over-exploited areas such as high-density of open bore wells and wells and in villages with drinking water problems, because setting up a harvesting project in over exploited areas will lead to the recharging of ground water in such villages.

Zones with outcrops and shallow basement across the general direction flow do not need formation of dyke (subsurface dam) as these themselves act as natural barriers to sub surface flow. The possible adverse impacts as a result of construction of the sub surface projects will be water logging, salination and pollution of ground water. These should be examined in detail.

The above guidelines should be adhered to with the help of geologist and irrigation department. The information on soil and land use survey can also be utilized.

Implications for the CIF sub-project context
The guidelines for water-shed development, percolation tanks, water harvesting dams and dykes needs to be the basis on which the watershed component of the APRPRP will be designed.

2.17 Operational Policies and Guidelines of the World Bank

2.17.1 OP 4.01 Environmental Assessment

The Bank requires environmental assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making.

Applicability to the CIF sub-project context
The EMF requires an assessment of all the sub-projects that will emerge from APRPRP. The details of the screening and assessment procedures are provided in the EMF.

2.17.2 OP 4.36 Forestry

In forest areas of high ecological value, the Bank finances only preservation and light, nonextractive use of forest resources. In areas where retaining the natural forest cover and the associated soil, water, biological diversity, and carbon sequestration values is the object, the Bank may finance controlled sustained-yield forest management. The Bank finances plantations only on nonforested areas (including previously planted areas) or on heavily degraded forestland.

Applicability to the CIF sub-project context
The focus of this policy is on sustainable extraction of forest resources. This emphasis has been built into the EMF specifically to those projects, which use forest resources. For example, Non Timber Forest Produce collection.

2.17.3 OP 4.04, OP 4.04 a, BP 4.04 Natural Habitats

The Bank does not support projects that, in the Bank's opinion, involve the significant conversion or degradation of critical natural habitats.

Wherever feasible, Bank-financed projects are sited on lands already converted (excluding any lands that in the Bank's opinion were converted in anticipation of the project). The Bank does not support projects involving the significant conversion of natural habitats unless there are no feasible alternatives for the project and its siting, and comprehensive analysis demonstrates that overall benefits from the project substantially outweigh the environmental costs.

If the environmental assessment indicates that a project would significantly convert or degrade natural habitats, the project includes mitigation measures acceptable to the Bank. Such mitigation measures include, as appropriate, minimizing habitat loss (e.g., strategic

habitat retention and post-development restoration) and establishing and maintaining an ecologically similar protected area. The Bank accepts other forms of mitigation measures only when they are technically justified.

In deciding whether to support a project with potential adverse impacts on a natural habitat, the Bank takes into account the borrower's ability to implement the appropriate conservation and mitigation measures. If there are potential institutional capacity problems, the project includes components that develop the capacity of national and local institutions for effective environmental planning and management. The mitigation measures specified for the project may be used to enhance the practical field capacity of national and local institutions.

In projects with natural habitat components, project preparation, appraisal, and supervision arrangement include appropriate environmental expertise to ensure adequate design and implementation of mitigation measures.

Natural habitats are land and water areas where (i) the ecosystems' biological communities are formed largely by native plant and animal species, and (ii) human activity has not essentially modified the area's primary ecological functions.

Critical natural habitats include existing protected areas and areas officially proposed by governments as protected areas and those recognized as protected by traditional local communities (e.g., sacred groves).

Implications for the CIF sub-project context Wildlife sanctuaries and national parks constitute critical natural habitats. The EMF addresses this in the context of the Wildlife (Protection) Act, 1972.

2.17.4 OP 4.09 Pest Management

In Bank-financed agriculture operations, pest populations are normally controlled through IPM approaches, such as biological control, cultural practices, and the development and use of crop varieties that are resistant or tolerant to the pest. The Bank may finance the purchase of pesticides when their use is justified under an Integrated Pest Management (IPM) approach.

In Bank-financed public health projects, the Bank supports controlling pests primarily through environmental methods. Where environmental methods alone are not effective, the Bank may finance the use of pesticides for control of disease vectors.

The procurement of any pesticide in a Bank-financed project is contingent on an assessment of the nature and degree of associated risks, taking into account the proposed use and the intended users. With respect to the classification of pesticides and their specific formulations, the Bank refers to the World Health Organization's '*Recommended Classification of Pesticides by Hazard and Guidelines to Classification'* (Geneva: WHO 1994-95).

The following criteria apply to the selection and use of pesticides in Bank-financed projects:
(a) They must have negligible adverse human health effects.
(b) They must be shown to be effective against the target species.
(c) They must have minimal effect on non-target species and the natural environment. The methods, timing, and frequency of pesticide application are aimed to minimize damage to natural enemies. Pesticides used in public health programs must be demonstrated to be safe for inhabitants and domestic animals in the treated areas, as well as for personnel applying them.
(d) Their use must take into account the need to prevent the development of resistance in pests.

2.17.5 OP 4.37 Safety of Dams

The Bank distinguishes between small and large dams.
a) Small dams are normally less than 15 meters in height. This category includes, for example, farm ponds, local silt retention dams, and low embankment tanks.
b) Large dams are 15 meters or more in height. Dams that are between 10 and 15 meters in height are treated as large dams if they present special design complexities—for example, an unusually large flood-handling requirement, location in a zone of high seismicity, foundations that are complex and difficult to prepare, or retention of toxic materials. Dams under 10 meters in height are treated as large dams if they are expected to become large dams during the operation of the facility.

Applicability to the CIF sub-project context:
For small dams generic dam safety measures designed by qualified engineers are usually adequate. No large dams (those above 15 metres of height) are expected to arise under the CIF sub-project component (in fact, check dams are usually well under 10 metres of height). In case a planned dam exceeds 10 metres of height triggering OP 4.37 it is likely to be rejected.

2.17.6 OD 4.30 Involuntary Resettlement

Involuntary resettlement should be avoided or minimized where feasible, exploring all viable alternative project designs. For example, realignment of roads or reductions in dam height may significantly reduce resettlement needs.

Applicability to the CIF sub-project context:
Certain sub-projects under CIF could require small amounts of land - mostly public but some private also. The land is often seen to be given voluntarily, without compensation, because of the strong private and community interest in the proposed activity. Sub-projects proposed under the project would be screened as per the Social and Environment Monitoring Framework developed as part of the preparatory process. Where land is provided voluntarily, a Memorandum of Understanding, a transparent public consultation process and independent monitoring to ascertain voluntariness, would be emphasized. Sub-projects wherein Involuntary Resettlement (OD 4.30) is likely to be triggered would be disallowed.

2.17.7 OP 4.11 Cultural Property

The Bank normally declines to finance projects that will significantly damage non-replicable cultural property, and will assist only those projects that are sited or designed so as to prevent such damage.

2.17.8 OD 4.20 Indigenous Peoples

The Bank's policy is that the strategy for addressing the issues pertaining to indigenous peoples must be based on the informed participation of the indigenous people themselves. Thus, identifying local preferences through direct consultation, incorporation of indigenous knowledge into project approaches, and appropriate early use of experienced specialists are core activities for any project that affects indigenous peoples and their rights to natural and economic resources.

Implications to the CIF sub-project context
Please refer to Tribal Development Plan.

Chapter 3

Impacts and Mitigation Measures

3.1 Introduction

The CIF sub-projects are community driven projects. It is not possible to anticipate exactly what the communities in the APRPRP will propose as sub-projects for support under the CIF. However, the APDPIP experience helps by giving an indicative list of sub-projects that could also emerge from the APRPRP. The impacts and mitigative measures of these projects will provide a fair understanding of what may be expected in the APRPRP.

Any new developmental activity has the potential to impact the environment. The impact may be significant or insignificant, positive or negative, direct or indirect, short term or long term, reversible or irreversible.

3.2 Impacts and Mitigation Measures for Selected Sub-project Types

The main purpose of this section is to present, for each possible sub-project area, those impacts that are significant and those mitigation measures that are effective and feasible.

This implies that impacts that are not significant and mitigation measures that are ineffective and unfeasible are not mentioned. The significance of the impact and the feasibility of mitigation measures has been determined in view of the nature and scale of the sub-projects and in view of the context of the rural poor.

Category	*Sub-project*	*Impact*	*Mitigation Measure*
Livestock	Dairy	Reduced grass productivity	Fodder cultivation Multiple fodder base (crop residue) Fodder management
		Soil erosion	Regulated grazing Stall feeding
		Reduced regeneration of tree species	
		Organic waste	Composting and use as manure
	Sheep rearing	Reduced grass productivity	Regulated grazing
		Soil compaction and erosion	
		Reduced regeneration of tree species	

	Goat rearing	Reduced grass productivity	Regulated grazing Regulated lopping of fodder trees
		Soil erosion	
		Reduced regeneration of tree species	
	Poultry	Loss of local breeds	Encourage rearing of local breeds

Category	*Sub-project*	*Impact*	*Mitigation Measure*
Irrigation	Bore well	Decline of water in existing open wells and bore wells	Minimum distance of 200 metres between bore wells
		Depletion of ground water	Ground water recharging practices Surface water harvesting practices (check dams, openwells, tanks, etc.) Water conservation measures (efficient irrigation and soil moisture conservation methods) Low water demanding crops (or adopt horticulture)
	Farm pond / Open well	Harvesting of rain water	No mitigation necessary
		Harvesting of surface water	
	Desilting tank	Increased water holding capacity of tank and increase in irrigated area	No mitigation necessary
		Ground water recharge due to increased percolation	No mitigation necessary
		Availability of silt	Use silt on farm land to enhance fertility Afforestation and soil conservation in tank catchment to reduce future siltation

Category	*Sub-project*	*Impact*	*Mitigation Measure*
Agriculture	Crop cultivation (ground nut, paddy)	Water pollution due to application of fertilizers (Ground nut cultivation has positive impact of nitrogen fixation thus enhancing soil fertility)	Optimal application of fertilizers Use of organic fertilizers
		Water pollution due to application of pesticides	Minimal application of chemical pesticides as part of IPM
		Enhanced water depletion if source is ground water	Adopt water conservation practices
	Horticulture, Vegetable farming	Water pollution due to application of fertilizers	Optimal application of fertilizers Use of organic fertilizers
		Water pollution due to application of pesticides	Minimal application of chemical pesticides as part of IPM
		Enhanced water depletion if source is ground water	Adopt water conservation practices
			Soil conservation measures required if land is undulating (eg: cashew cultivation)
	Land development	Conversion of non-cropland to cropland	Soil and water conservation measures
		Soil loss during leveling for irrigation	Conserve top soil Apply silt if top soil is not adequate or is eroded If highly undulating adopt horticulture or agro forestry

	Pisciculture	Organic pollution from excess feed	Regulate feeding
		Oxygen depletion due to overstocking	Regulate intensity of stocking
		Loss of local fish species	Avoid exotic species

Category	*Sub-project*	*Impact*	*Mitigation Measure*
Forest products	Non Timber Forest Produce collection	Complete removal of seeds, fruits and flowers will affect regeneration	Avoid 100 per cent removal of seeds, fruits and flowers to allow for regeneration
		Lopping of branches for NTFP collection	Avoid lopping of branches. Collect fallen seeds, fruits, flowers
		Over extraction affects life of tree and leads to loss of species	Training in sustainable harvesting Regulation of harvesting

Category	*Sub-project*	*Impact*	*Mitigation Measure*
Construction	Shed for cattle	Positive impact on health and hygiene	No mitigation required
		If large sheds are located near water source, can lead to contamination	Locate sheds atleast 100 metres away from water sources Compost waste materials for use as fertilizer
		Increased demand on building materials if large number of sheds are proposed	Use of energy efficient and environmentally sound building construction materials (eg: stabilized and mud blocks)

	Check dam	Submergence of land due to water storage	Height below 10 metres Multiple smaller dams
		Reduction in soil erosion	Check for technical soundness and safety
		Improving ground water level	
		Reduction in siltation of downstream tanks	
		Water available for cattle, small vegetable garden, etc.	

Category	*Sub-project*	*Impact*	*Mitigation Measure*
Micro-enterprises	Catering (Mess)	Increased consumption of fuel wood impacting trees	Use of efficient smokeless cook stoves Use of LPG stoves
		Smoke from woodstoves impacts health	
		Improper disposal of food waste causing pollution	Composting of food waste Use as animal feed
		Disposable serving utensils leads to increase in solid wastes	Use of biodegradable disposables (leaf plates) Use of reusable utensils (steel plates)
	Crafts	Reduction of natural resource (bamboo, tree leaves) if extraction is not sustainable	Training in sustainable extraction and efficient use
	Pottery	Removal of soil from tank bed functions as desilting	No mitigation required
		Depletion of tree cover due to fuel wood use	Adopting efficient kiln design Use of alternative fuel resources (eg: rice husk)

	Garment making	No significant impact	No mitigation required
	Brick making	Loss of top soil if source is agricultural land	Use soil from tank bed as it helps in desilting Switch to stabilized blocks, concrete blocks, stone blocks, etc.
		Depletion of tree cover due to fuel wood use	Adopting efficient kiln design Use of alternative fuel resources (eg: rice husk, coal) Fuel wood tree plantations
	Leather (Animal skin and carcass processing)	Organic pollution (as processing is by traditional methods without chemical use) Impact on human health	Well managed waste disposal of solid and liquid wastes Locate at least 500 metres away from water sources and human habitation
	Marketing interventions	No significant impact	No mitigation required

Chapter 4

Recommendations from Public Consultations

4.1 Purpose

In order to disseminate the contents of the EMP and PMP to the public and to obtain their views and suggestions about the project and the environmental aspects, public consultations were conducted at various levels to represent the cross section of the population in the project area.

This report delves on the process, followed prior to the public consultations and the deliberations during the consultations at various levels.

4.2 Pre Consultation Process

4.2.1 Selection of locations/places for the consultation

The EMP and PMP were put through public consultations in 3 districts of AP, namely Warangal, Kurnool, and Prakasam. These districts were selected on geo-political considerations. AP has three major geo-political regions: Telengana, Coastal Andhra and Rayalaseema, from each of which a district was selected- Warangal from Telengana, Prakasam from Coastal Andhra and Kurnool from Rayalaseema. There were altogether 27 consultations in the districts, 9 in each district, conducted between 20th-31st of May 2002. There was one consultation at the state level in Hyderabad.

The selection of the 8 villages in each District was on the basis of their varied geographical conditions. The selection was done in consultation with local NGOs and District officials. Local NGO field staff informed the villages about the programme and venue through tom-tom and house-to-house visits. All the village level public hearings were conducted at a convenient time in order to ensure villagers' attendance.

4.2.2 Dissemination of information

- The full report of EMP and PMP was posted on the website mentioned above.
- The Executive Summaries of the EMP and the PMP were translated into Telugu. 1000 copies were printed for circulation.
- Orientation on the public hearing to the consulting teams was conducted on 14th May 2002 at Hyderabad.
- Notification in newspapers was given in two widely circulated daily newspapers, namely Deccan Chronicle (English) and Vaartha (Telugu). A change of date for the Public Consultation in Hyderabad was also issued. These appeared on the 15th and 19th May respectively.

- Executive Summaries in Telugu were posted to a number of NGOs and other relevant institutions and concerned local resource persons.

- Executive Summaries in Telugu were distributed to government officials and non-officials, both before and during consultations.

- Pre-consultation visits to the districts by the consulting teams were made to brief the officials and to fix the time schedule for mandal / village level consultations and to constitute district-level witness committees comprising of village elders, officials and prominent local resource persons. Consulting teams also visited the villages to inform the people regarding the consultations.

- Arrangements were made to video-graph, and photograph the proceedings and for minutes to be recorded in Telugu and English.

4.3 Consultation Process

Public Consultations were carried out in 24 Mandal/villages in three project districts. District level consultation at the three district head quarters – Warangal, Ongole (Prakasam) and Kurnool and a State level consultation at Hyderabad were also carried out.

A nine-member committee comprising of elders, Government Officials, Dalit/NGO leaders and prominent political leaders was constituted in each district and the members of these committee have attended the public hearings at the village level as well. Local political leaders attended the public consultation as well.

Please see Annexure 4.1 for Brief Details of the Public Consultations. The complete documentation of the consultation process is available as a separate report.

4.4 Recommendations

The recommendations from the public consultations have been integrated into the Environmental Management Framework (EMF).

4.4.1 Drinking Water

- In many villages people demanded drinking water facilities. In some Fluorosis affected villages it was found that the canals of the irrigation projects were passing through in the immediate neighborhood. The people naturally felt aggrieved that this fluoride free water, which could have been supplied to them, is denied to them. Effort must be made on an emergency basis to supply drinking water from the canals to the villages in the neighborhood. In one of the villages de-fluoridation plant under Netherlands Assistance Programme was found to be functioning satisfactorily. How to extend this facility may be explored.
- Indiscriminate bore well sinking increases fluoride contamination in ground water. Restriction of Bore well sinking will mitigate the fluorosis problem to some extent.
- Roof water harvesting for direct use for drinking should be piloted especially in fluoride affected areas. Similarly water from natural hill springs can be stored in closed tanks for drinking water purpose.

4.4.2 Health & Sanitation

- A demand for drainage channels came up repeatedly in many villages. Wherever the drainage channels are already there, maintenance mechanism was found lacking. This should be put in place through the Panchayat system.
- Some demand for toilets came up in some villages, these should be constructed complete with maintenance machinery.
- Safety measures and protection devices against pesticides while spraying particularly for agricultural workers and women should be well publicized and made available in the local medical / pesticides shops. Information about how to handle pesticides should be widely disseminated through posters and hoardings.

4.4.3 Land, Agriculture, Irrigation

- Soil erosion should be arrested through watershed development programme.
- Water logging was found to be a big problem in some villages. This can be controlled by constructing channels along the fields. This can be a sub project in this program and it can also be taken up as part of watershed development programme.
- There was a lot of demand for soil testing facilities to be made more easily accessible so that unnecessary and high use of fertilizers can be avoided.
- Increase of cattle population to enhance organic manure availability with development of adequate fodder base and veterinary facilities should become an important component of the programme.
- Green manuring crops & vermicomposting should be promoted in a big way.
- Information campaign on pesticides use should be a mandatory component of the programme.
- More emphasis should be focused on bio- pesticides production, training for the same should be imparted to the farmers.
- Organic crops should be promoted with incentive price support and marketing facilities.
- Farmers reported that water from surface sources was found to be more nutritive for irrigation purpose than ground water. Surface water resources should be developed for irrigation purpose wherever possible.
- Competitive drilling of borewells should be tackled by developing a package of incentives & penalties. The recently enacted Land Water Tree Act should be implemented effectively in its spirit to further prevent depletion of ground water table.

4.4.4 Horticulture and Forestry

- In some areas, particularly in Prakasam district, very little greenery was noticed including on the hills. Afforestation programme and social forestry programmes should be promoted.
- Suitable horticulture crops with drip irrigation facilities will wean people away from water intensive crops like sugarcane and paddy as well as increase the vegetative cover

4.4.5 Fisheries and Industry

- Aquaculture projects should be promoted with due caution, as land degradation and water pollution from aquaculture is endemic in these areas.
- Slate & granite industry workers in Prakasam district suffer from respiratory problems and malaria. The large pits in these areas should be covered or water should be treated against vectors like mosquitoes. Workers should receive suitable medical treatment on a concessional basis.

Annexure 4.1 Brief Details of the Public Consultations

DISTRICT: PRAKASAM

S.No	Mandal	Village	Date of Consultation
1.	Ballikurava	Gangapalem	21-05-2002
		Vemavaram	24-05-2002
2.	Pullalacheruvu	Mutukula	22-05-2002
		Chowtappacharla	22-05-2002
3.	Konakanamitla	Marripalem	23-05-2002
		Ambapuram	23-05-2002
4.	Markapur	Bodapadu	23-05-2002
		Peda Nagulavaram	24-05-2002

DISTRICT: WARANGAL

S.No	Mandal	Village	Date of Consultation
1.	Zaffargadh	Zaffargadh	22/05/02
		Uppugallu	22/05/02
2.	Kesamudram	Kesamudram	23/05/02
		Inugurthy	23/05/02
3.	Cheriyal	Cheriyal	24/05/02
		Akunur	24/05/02
4.	Mulugu	Mulugu	25/05/02
		Jangalapally	25/05/02

DISTRICT: KURNOOL

S.No	Mandal	Village	Date of Consultation
1.	Dhone	Dhone	21/05/02
2.	Pathikonda	Pathikonda	21/05/02
3.	Yemmiganur	Yemmiganur	22/05/02
4.	Kawthalam	Kawthalam	22/05/02
5.	Rudravaram	Rudravaram	23/05/02
6.	Sirivella	Sirivella	23/05/02
7.	Pamulapadu	Pamulapadu	24/05/02
8.	Kothapally	Kothpally	24/05/02

State-Level Public Consultation on EMP & PMP - Hyderabad, 31st May 2002

The hearing was held at SERP office from 11a.m. to 1p.m. The public hearing was attended by representatives from Andhra Pradesh Pollution Control Board, CPR Environmental Education Society, AP NGO's Committee on Forests, Suraksha and Assist, NGO's from Prakasam District, ECO development society from Kurnool and MV Foundation from Hyderabad. Mr. Vijay Kumar, Project Co-ordinator introduced the subject and Mr. Sujeet Kishen of Ernst & Young Pvt Limited, briefly described the contents of EMP and PMP and invited opinions and suggestions form the participants.

- It was pointed out that developmental activities other than APRPRP were also carried out by other projects that did not have an environment screening process, which may have bearing on the environment of the region. There is need to extend the environment aspects to all the projects.

- Although APRPRP is a demand driven project there is a need to suggest a basket of eco-friendly projects to the people so that their choices will be made that much easier, instead of rejecting their choices of projects on the basis of environment screening.

- In spite of stringent laws, poaching and smuggling goes on in forests on a large scale. There is need to show the tribals alternative avenues of employment.

- The great Indian Bustard in Kurnool District is facing threat from high pesticide use, which gets leached into the reservoir during rains.

- High schools in the project area should be actively involved in Environmental matters and providing training to teachers will go a long way to enhance environment awareness.

- Water harvesting structures considerably decreases the fluoride content in drinking water and should be actively promoted in fluoride, affected villages.

- The relevant laws and acts should be displayed in relevant public offices so that people become aware of them, for eg. laws relating to pesticides ,bore wells, poaching, etc.

- Everybody ends up asking for livestock units in demand driven projects. Non-farm employment avenues and training in them should be imparted.

Chapter 5

Environmental Management Framework

5.1 The Perspective

The purpose of the Environmental Management Framework is to ensure that neither the livelihoods of the poor nor the environment are compromised. It is to explore possibilities of making the efforts to improve livelihoods as well as conservation of the environment complimentary so that there are sustained benefits from the developmental activities initiated.

Specifically, the Environmental Management Framework will contribute to the goal of poverty reduction by:

- preventing and/or mitigating any negative environmental impact that may emerge from the sub-projects
- ensuring the long term sustainability of benefits from sub-projects by securing the natural resource base on which they are dependent
- facilitating pro-active sub-projects that can be expected to lead to increased efficiency and improved management in the use of natural resources resulting in improvements in local environmental quality and human well-being

The Environmental Management Framework for the APRPRP is prepared based on the experiences and learnings gained so far in the implementation of the Framework designed for the APDPIP.

5.2 Screening for Decision on Level of Environmental Assessment

Environmental screening is intended to ensure that proposed projects are subject to the appropriate extent and type of Environmental Assessment (EA). The EA process generally begins with screening at the time of project identification. Environmental screening also helps to determine the choice of EA instruments, depending on the needs of the project.

The APRPRP project is categorized as Financial Intermediary (FI) project. The FI project is defined in general terms as a project or operation financed through a financial intermediary. The project would finance several micro sub-projects to improve the livelihood of the poorest of the poor in Andhra Pradesh.

Based on the *scale* and *nature* of sub-projects currently emerging from APDPIP the screening procedure for the APRPRP has been identified. The sub-projects depending on the location, type and nature of impacts are categorized as Level 0, Level 1, Level 2 and Level 3.

Four levels of environmental assessment are suggested:

Level 0: The proposed sub-project doesn't depend on or use any natural resource directly (such as water, forests, grazing land, soil, etc) and more importantly doesn't adversely impact any natural resource (such as ground water depletion, soil erosion, and loss of Biodiversity). A detailed environmental assessment is not required for sub-projects in this category (such as a sub-project on tailoring). However, depending on feasibility, some proactive environmental interventions may be included.

Level I: The proposed sub-project has either marginal or short-term impact on the natural resources or environment (such as a small scale cooking operation that consumes fuel wood). Even if a project has only positive or beneficial impact on environment (such as soil and water conservation), it is necessary to ensure the positive impacts. Thus Environmental Review is suggested.

Level II: If the proposed project has a significant or irreversible or long-term negative impact (such as bore well leading to depletion of ground water), Level II assessment is suggested. This level could be termed as Limited Environmental Assessment.

Level III: If the proposed sub-project has a severe adverse environmental impact, that cannot be mitigated within a feasible timeframe and budget, Level III assessment is suggested. This level could be termed as Environmental Impact Assessment. However, the probability of such sub-projects emerging is very less. In case such a sub-project does emerge, it will most likely be rejected, as mitigation would demand time and resources beyond that available for a CIF sub-project.

The Level I assessment will be done by the Community Coordinator.
The Level II assessment will be done by the district level Environment Resource Group (ERG) members.
The Level III assessment will be commissioned by the State Project Monitoring Unit in consultation with the State Environment Agency.

A listing of sub-projects that fall into each of these categories is presented as 'Sub-project Classification Table' (Appendix 5.1). This listing will be updated on a half-yearly basis to include any new sub-projects that have been recently developed. The 'Criteria for Decision on Level of Environmental Assessment' (Appendix 5.2) is also presented.

The 'General Guidelines for Screening of Sub-projects' (Appendix 5.3) will help in decision making with regard to any sub-project that is not currently covered in the listing of sub-projects. In some cases the CC may find it difficult to screen the sub-projects using the 'General Guidelines for Screening of Sub-projects'. In such cases, the Appraisal Team (and/or the ERG) can double check on the level of screening.

Once the sub-projects are classified, the CC checks the 'Negative List of Sub-projects' (Appendix 5.4). If the sub-project falls in the negative list, then it is rejected.

5.3 Assessment of Potential Impacts of Sub-projects

The sub-projects for APRPRP are expected to be similar to the sub-projects currently emerging in the APDPIP. The physical, biological and social impacts of probable sub-projects have been predicted and their mitigative measures have been recommended in the Chapter 4: Impacts and Mitigative Measures. Of all the impacts and mitigative measures suggested in the study, the ones most relevant to the scale and nature of the sub-projects will be integrated in the tools that will be developed for Level I and Level II assessments. This is to ensure that time and resources are invested efficiently both in the identification of the impacts and in their mitigation.

After classifying the sub-project and ensuring that it does not belong to the negative list, the CC proceeds to use the appropriate assessment tools for the particular level of assessment.

Level 0: No detailed environmental assessment is necessary.

Level I: If the screening indicates that a Level I assessment is required, the CC is to refer to Level I tools to determine (i) whether or not to proceed with the sub-project (ii) measures to mitigate the impacts of the sub-project, if it is decided to proceed with the sub-project. For each sub-project type, specific Level I tools are given. (Appendix 5.9). For those sub-projects for which the sub-project specific tools are not available the CC will use the ‘General Guidelines for Environmental Assessment of Sub-projects’ (Appendix 5.5) and conduct the assessment.

Level II: If the screening indicates that a Level II assessment is required, the CC will refer it to the DPMU for Level II assessment. The DPMU will invite the Environment Resource Group (ERG) to visit the sub-project site and conduct the Level II assessment. The ERG will refer to Level II tools to determine (i) whether or not to proceed with the sub-project (ii) measures to mitigate the impacts of the sub-project, if it is decided to proceed with the sub-project. For each sub-project type, specific Level II tools are given. (Appendix 5.9). For those sub-projects for which the sub-project specific tools are not available the ERG members will use the ‘General Guidelines for Environmental Assessment of Sub-projects’ (Appendix 5.5) and conduct the assessment.

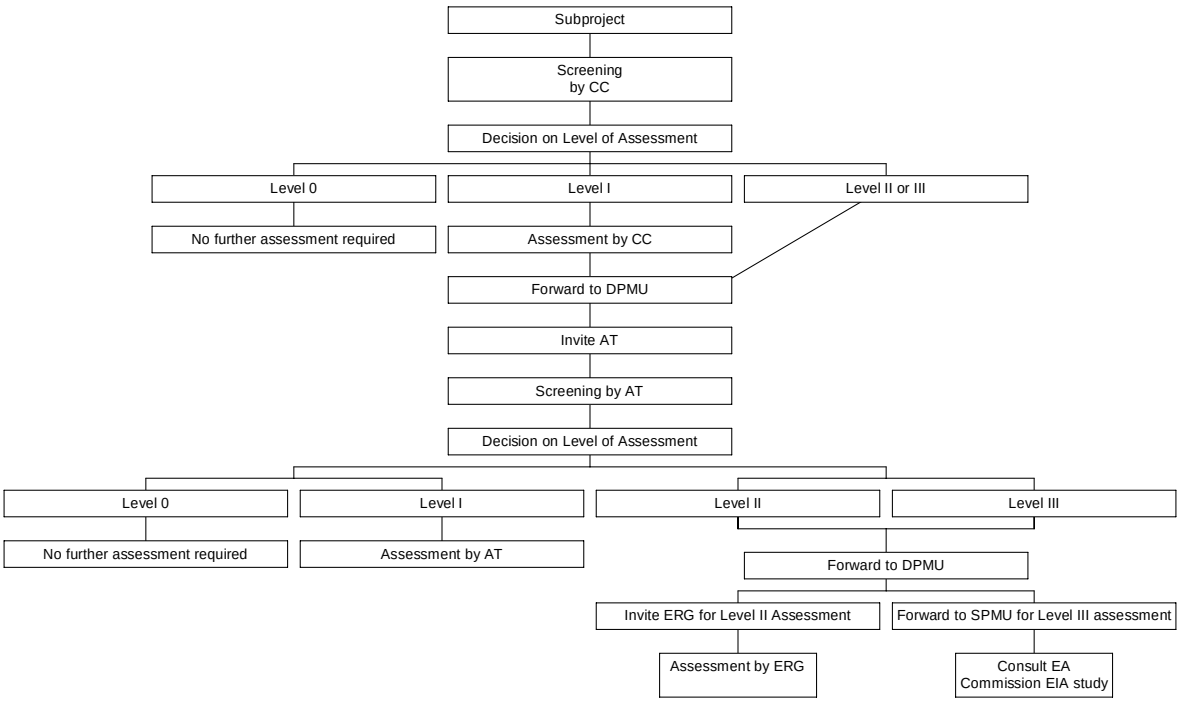
Level III: If the screening indicates that a Level III assessment is required, the CC will refer it to the DPMU for Level III assessment. The DPMU will forward the sub-project for assessment to the SPMU. The SPMU will issue a contract in consultation with the Environment Agency for a detailed Environmental Impact Assessment of the sub-project.

After the proposal is forwarded by the CC to the DPMU, depending on the scale (in terms of finances) an Appraisal Team is invited by the DPMU to independently appraise the sub-project and make suitable recommendations. The Appraisal Team will use the ‘Sub-project Classification Table’ or the ‘General Guidelines for Screening of Sub-projects’ to check if the level of assessment identified by the CC for the sub-project is correct and then proceed to use the Level I tools to determine the impacts and suggest mitigation

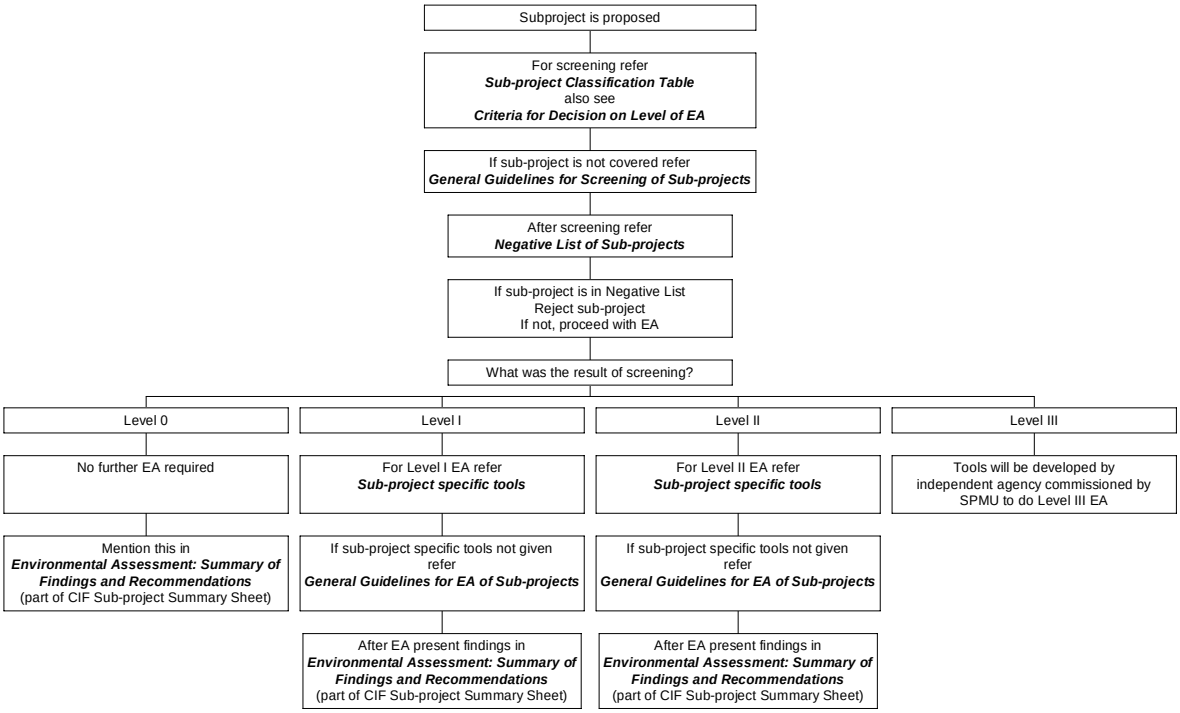
measures. If a Level II or Level III assessment is required, the sub-project is referred to the DPMU for further action.

For a Level II assessment the DPMU invites the Environment Resource Group (ERG) members to conduct the assessment. For a Level III assessment the DPMU forwards the sub-project proposal to the SPMU for further action.

Process for Environmental Assessment



An indicative set of tools (for Level I and Level II assessments), based on those developed as part of APDPIP, are presented (Appendix 5.9). A decision-tree format for the tools has been adopted as it helps in focusing attention on the impacts, integrates mitigation measures and helps in arriving at a decision. These tools have been field tested on a sample basis and have been found to be acceptable to both the CCs and the ERG members. However, they will need to be modified based on feedback from users. More tools will need to be developed to cater to the assessment needs for new sub-project areas that emerge from time to time. For those sub-projects for which the sub-project specific tools are not available 'General Guidelines for Environmental Assessment of Sub-projects' have been provided (Appendix 5.5).



5.4 Training

Training programmes to equip the DPMU staff members (responsible for facilitating implementation of the EMF) and the ERG members in using the environmental assessment tools will be organized by the Environment Agency.

The DPMU staff, the ERG members and the Livelihood Associates (LAs) will form the core group of trainers who will train the CCs and the Appraisal Team members in environmental assessment.

5.4.1 Training Needs

Based on the interactions with the CCs, DPMU members and the Environment Resource Group members in the APDPIP, the following training needs have been identified:

- Linkages between environment and poverty
- Basic concepts in environment and ecology
- Environmental issues in the district and implications for CIF sub-projects
- Role of Environmental Assessment
- System for Environmental Assessment
- Tools for Environmental Assessment
- Field techniques for Environmental Assessment

- Mitigation measures
- Proactive environmental intervention through CIF sub-projects

5.4.2 Training of Trainers

The core group of trainers from every district will comprise of the ERG members (at least six members), two of the DPMU staff (the CIF coordinator, the Monitoring and Learning coordinator, the Training coordinator or another identified person) and two Livelihood Associates (LAs). Thus about 10 people from each district will be trained by the Environment Agency.

The training will involve an initial orientation workshop, a main training programme and refresher-training programmes. The orientation workshop will be organized in two batches. It will be for a duration of one day. The main and refresher training programme will be organized in five batches each. Each batch will have about 30 participants each. This training will be organized regionally. Each training programme will be for duration of 4-5 days. The refresher training programmes will be organized twice every year. In all ten such refresher training programmes will be organized.

5.4.3 Training of CCs

This core group of trainers will in turn train the CCs and the Appraisal Team members in environmental assessment. Estimating that there will be about 100 CCs in each district, a total of about 1600 CCs will be trained. In addition to this there will be about 10 Appraisal Team members in each district and about 10-15 Assistant Project Manager/Social Organizers who will be trained.

The training will involve an initial orientation session, a main training programme and refresher-training programmes.

The orientation session will be part of the induction training for the CCs and APMs/SOs. It will be part of the orientation workshop for the Appraisal Team members.

The main and refresher training programmes will be organized in seventy-five batches each. Each batch will have about 20-25 participants each and will be organized in the districts. Each training programme will be for duration of 2-3 days. About 4 or 5 such batches will have to be organized in each district depending on the number of CCs and Appraisal Team members.

The refresher training programmes will be organized twice every year. In all ten such refresher training programmes will be organized.

5.4.4 Content and Methodology

The broad contents of the training programmes will be:

- Environment and Poverty: Linkages
- Basic concepts in Environment and Ecology
- Environmental issues of the district and implications for CIF sub-projects
- Role of Environmental Assessment
- System of Environmental Assessment
- Tools for Environmental Assessment
    - Screening
    - Level I
    - Level II (only for ERG members)
- Proactive Environmental Intervention
- Environmental Education and Awareness

The methodology of the training will include hands-on environmental assessment of sub-projects in addition to exposure visits, interactions with resource persons and group exercises.

5.4.5 Training of Village Activists

A session on the EMF will be part of the induction training for the Village Activists.

5.4.6 Awareness Programmes for Community

Each CC will organize environmental awareness programmes for the communities he/she is working with at least once every year. In all each community will get an exposure to at least three environmental awareness programmes from the CC over the five-year project period. The communication material developed as part of the EMF will assist the CC in organizing these programmes.

5.5 Institutional Arrangements

The administrative set up followed for APDPIP has been retained for APRPRP with some modifications. The modifications have been made based on the learnings from the APDPIP experience in order to provide ease of functioning and understanding the project.

The basic administrative structure in APRPRP for the implementation of the EMF will be at the State, District, Mandal and Sub-project levels:

State Level
Internal: State Project Management Unit (SPMU)
External: Environment Agency

District Level
Internal: District Project Management Unit (DPMU)
External: Environment Resource Group (ERG)

Mandal Level
Mandal Community Support Cell (MCSC)

Sub-project Level
Internal: Sub-project Level Support by Livelihood Associates

An overview of the sequence of activities in the CIF sub-project generation, appraisal, monitoring and evaluation will help in understanding the administrative structure.

1. The need for the sub-project is identified by the Common Interest Group (which is a part of the Self Help Group/s) in consultation with the Community Coordinator (CC) through the Village Organization.

2. The CC assists the community in developing the project proposal.

3. The CC uses the Screening Tool to decide on the level of environmental assessment required for the sub-project. The CC will refer to the 'Sub-project Classification Table' (Appendix 5.1) to find out the level of assessment required. The 'Criteria for Decision on Level of Environmental Assessment' (Appendix 5.2) will help the CC understand the reason why the sub-project has been classified as requiring that particular level of environmental assessment. In case the sub-project does not feature in the 'Sub-project Classification Table', the CC will use the 'General Guidelines for Screening of Sub-projects' (Appendix 5.3) to arrive at the decision on the level of assessment required. The CC will then refer to the 'Negative List of Sub-projects' (Appendix 5.4) to ensure that the proposed sub-project is not on the list.

4. If the Screening Tool indicates that a Level 1 Assessment is required, the CC will do it using the tools provided (Appendix 5.9). If sub-project specific tools are not available the CC will use the 'General Guidelines for Environmental Assessment of Sub-projects' (Appendix 5.5) and conduct the assessment. The summary findings and recommendations of the Level 1 assessment by the CC will feature in the prescribed format (Appendix 5.6) as part of the Sub-project Proposal Appraisal Sheets (referred to as the *CIF Sub-project Summary Sheet*).

5. Once the proposal is forwarded by the CC to the DPMU, depending on the scale (in terms of finances) an Appraisal Team is invited by the DPMU to independently appraise the sub-project and make suitable recommendations.

6. The Appraisal Team (AT) will use the Screening Tool to decide on the level of environmental assessment required for the sub-project. The AT will refer to the

'Sub-project Classification Table' (Appendix 5.1) to find out the level of assessment required. The 'Criteria for Decision on Level of Environmental Assessment' (Appendix 5.2) will help the AT understand the reason why the sub-project has been classified as requiring that particular level of environmental assessment. In case the sub-project does not feature in the 'Sub-project Classification Table', the AT will use the 'General Guidelines for Screening of Sub-projects' (Appendix 5.3) to arrive at the decision on the level of assessment required.

7. If the Screening Tool indicates that a Level 1 Assessment is required, the AT will do it using the tools provided (Appendix 5.9). If sub-project specific tools are not available the AT will use the 'General Guidelines for Environmental Assessment of Sub-projects' (Appendix 5.5) and conduct the assessment. The summary findings and recommendations of the Level 1 assessment by the AT will feature in the prescribed format (Appendix 5.6) as part of the Sub-project Proposal Appraisal Sheets (referred to in APDPIP as the *CIF Sub-project Summary Sheet*).

8. Both the CC and the AT, based on the results of the screening, may recommend the sub-project proposal for Level II assessment by the ERG to the DPMU.

9. The ERG members, on request by the DPMU, will visit the sub-project area and conduct the Level II assessment using the tools provided (Appendix 5.9). If sub-project specific tools are not available the ERG will use the 'General Guidelines for Environmental Assessment of Sub-projects' (Appendix 5.5) and conduct the assessment. The summary findings and recommendations of the Level 2 assessment by the ERG will feature in the prescribed format (Appendix 5.6) as part of the Sub-project Proposal Appraisal Sheets (referred to in APDPIP as the *CIF Sub-project Summary Sheet*).

10. In case the Screening Tool indicates that a Level III assessment is required, the DPMU will refer to sub-project proposal to the SPMU.

11. The SPMU in consultation with the Environment Agency will deicide on whether the sub-project needs to be rejected and if required will commission an independent agency to do the Level III assessment.

12. It is the responsibility of the project team to ensure that the recommendations made by the environmental assessments are implemented.

5.5.1 State Project Management Unit

Personnel: A team of one Project Manager and two Project Executives will form the team at the SPMU to facilitate the implementation of the EMF and to ensure its mainstreaming in the APRPRP. This team will form a part of the Livelihoods Unit at the SPMU.

Responsibility: The Project Manager will be responsible for the effective implementation of the EMF and towards this the following tasks will be undertaken with assistance from the Project Executives:

1. Appointment of the Environment Agency (EA).
2. To decide on the sanctioning of sub-projects screened as requiring a Level III assessment and appointment of an independent agency in consultation with the SEA to undertake Level III assessments as and when required.
3. Appointment of an independent agency to conduct an environmental audit once in two years.
4. Supervision of implementation of special projects on environment.

5.5.2 District Project Management Unit

Personnel: One of the District Project Managers in the DPMU will have the responsibility for ensuring that the provisions of the EMF are adequately met in the sub-project cycle. The DPM will be selected based on the individual's interest and commitment on environmental issues and could be the CIF coordinator or the Monitoring and Learning Coordinator or another DPM.

Responsibility: The DPM will be responsible for the effective implementation of the EMF in the district and towards this the following tasks will be undertaken with support from the SPMU:

1. Appointment of the ERG.
2. Facilitating the work of the ERG and of the Appraisal Team.
3. Facilitating the work of the Environment Agency in the district.
4. Integrating information on implementation of the EMF into the CIF MIS. Providing the Environment Agency access to the CIF MIS.
5. Supervising the environmental assessment process in order to ensure that it is conducted effectively.
6. Implementation of special projects on environment

5.5.3 Mandal Community Support Cell (MCSC)

Personnel: The Assistant Project Manager/Social Organizer (APM/SO) and the CCs at the Mandal level form the team through which the EMF is implemented. The EMF is one of the several other responsibilities APM/SO and the CCs implement.

Responsibility: The APM/SO will be responsible for the effective implementation of the EMF in the mandal and towards this the following tasks will be undertaken with assistance from the CCs:

1. Facilitating environmental assessment by the ERG and of the Appraisal Teams in the mandal.
2. Supervising the environmental assessment process in order to ensure that it is conducted effectively.
3. Implementation of special projects on environment.

5.5.4 Sub-project Level

At the sub-project level there will be Livelihood Associates (LAs) who will have the responsibility to ensure that environmental considerations have been incorporated in the Livelihood Enhancement Action Plan (LEAPs). In each district, there will be about 2 LAs who will have this additional responsibility.

5.5.5 State Environment Agency

As in APDPIP an Environment Agency will be appointed for the APRPRP. The Environment Agency will have the responsibility of facilitating the implementation of the EMP. This Environment Agency will provide support on (i) developing tools for sub-project screening and assessment (ii) development and delivery of training, education and communication material (iii) monitoring (iv) supervision (v) coordinating the conduct of Level III assessments, if any, and (vi) provide ad hoc technical support. The terms of reference for the Environment Agency are presented (Appendix 5.7).

5.5.6 Environment Resource Group

An Environment Resource Group (ERG) needs to be appointed for each district to support the DPMU in the implementation of the EMF. This group will include individuals from NGOs, departments of universities, individual experts and consultants. These individuals will be contracted to provide support to implement the EMF at the district level. In addition, one or two individuals in each district will be selected to develop a team to provide further support. The selection of these individuals will be based on the identification of environmental issues prevalent in the district where further environmental expertise needs to be developed and support is required.

The terms of reference for the ERG are presented (Appendix 5.8).

Relationship between the Environment Agency and Environment Resource Group

The Environment Agency will report to SPMU, while the Environment Resource Group will be in contact with the DPMU.

The Environment Agency will facilitate the functioning of the ERG by training and feedback on environmental assessment conducted by the ERG. The ERG will support the work of the Environment Agency by providing feedback on utility of the assessment tools, the need for new tools for emerging sub-project areas and inputs for the environment monitor.

5.6 Proactive Environmental Pilot Projects

The EMF will proactively encourage the emergence and implementation of sub-projects which contribute to improved livelihoods through the conservation of the environment as special sub-projects. These sub-projects will be so chosen that the community would demand the same after successful demonstration of the pilot sub-projects and would put forward sub-project proposals for funding under the CIF. Sub-projects will be developed in 8 areas which will include:

- Those that involve the use of alternate resources (for example, biomass gassifiers for rural electrification)
- Those that focus of efficient use of existing resources (for example, fuel efficient cook stoves)
- Those that create or enhance natural resources to support livelihoods (for example, energy plantations, water conservation works)
- Those that create or enhance systems for sustainable management of natural resources (for example, community fodder plantations, IPM practices)
- Those that enhance awareness on local environmental management for sustainable livelihoods (for example, environmental education programmes)

The SPMU will supervise the implementation of the special sub-projects. In all 32 pilot sub-projects would be implemented in the 16 APRPRP districts. Each pilot sub-project will cover 4 to 5 villages.
The State Environment Agency will collect and disseminate information on the proactive environment intervention options to the APRPRP functionaries through educational material and through integration of these components into the training programmes. It will also provide information on technical expertise that can be tapped for implementation of the special sub-projects.

5.7 Environmental Supervision, Monitoring & Auditing

5.7.1 Environmental Supervision

Environmental supervision would be carried out at two levels. At the district level, as part of their overall supervisory responsibilities, the APRPRP staff would be required to verify that CCs are correctly using EMF guidelines and outputs, and the environment mitigation measures prescribed in the approved sub-project are implemented. The DPMUs would verify these issues from the same sample of sub-projects that they use for other supervisory requirements, and the results would be included in their overall supervision reports provided to the SPMU. These supervision reports would be submitted to the Environment Agency for review of the EMF implementation.

At the state level, the Environment Agency will conduct six-monthly supervision of the EMF, selecting a sample of Level I, Level II and all the Level III category sub-projects. The Environment Agency will develop indicators for and assess the following:

- the technical viability and user-friendliness of the environmental assessment tools used by the CCs, the Appraisal Team members and the ERG

- the accuracy of application of the screening process by the CCs, the Appraisal Team members and the ERG
- the implementation and effectiveness of the mitigation measures recommended by the CCs, the Appraisal Team members and the ERG
- the quality and quantity of sub-projects that proactively contribute to environmental conservation while addressing the core concern of poverty alleviation
- the implementation of community environmental awareness programmes by the CCs

Supervision of the EMF will commence once the CCs and Appraisal Team members are trained in the EMF and will continue on an on-going basis once every six months.

5.7.2 Environmental Monitoring

It is the responsibility of the Environment Agency to remain abreast of the changing environmental conditions and emerging environmental concerns in the APRPRP areas. The EA will constantly be involved in collecting information from various departments of the Government and civil society sources. On the basis of the information, the Environment Agency will recommend revisions to the EMF and highlight local concerns to the DPMUs. Details of changing conditions, emerging concerns, recommended revisions and local issues would be included in the six-monthly monitoring reports provided to the SPMU. A newsletter based on the information collected for the Environmental Monitor will help in reaching out to all the project personnel.

5.7.3 Environmental Auditing

The Director of SPMU will contract an Environmental Audit of APRPRP to an external agency (other than the Environment Agency) once in two years to assess the effectiveness of the EMP implementation. The external agency will be an independent civil society organization. The principal focus of the audit will be to assess the extent to which the EMF has lead to the implementation of appropriate mitigation measures in the sub-projects and has promoted the implementation of environmentally beneficial sub-projects. A secondary goal of the audit would be to attempt an assessment of the extent to which the APRPRP sub-projects may have lead to improvement or deterioration in environmental quality.

Depending on the results of the above evaluation, the audit must rate the environmental performance in accordance to World Bank (1996 a) criteria as described below:

1. Highly Satisfactory – Projects where the environmental components are being implemented in a timely and satisfactory manner.
2. Satisfactory –Projects where there are some unpredicted impacts but they do not undermine the progress of execution of projects and are addressed by the responsible agency, fall in the satisfactory category.

3. Unsatisfactory - Projects where, there are major problems in execution due to unexpected environmental impacts fall in this category. The measures suggested by the Environmental Agency and the ERG are not being addressed properly.

The terms of reference for the external audit will include details of the sample, scope of the audit and details of the key environmental parameters to be monitored.

Details of the sample:

The Environment auditing agency must review at least 5-10% of subprojects requiring an ER, 10-20% of subprojects requiring a LEA and all subprojects requiring an EIA.

Scope of the audit:

The Environmental Audit should include an assessment of:
1. Whether the projects are categorized correctly into Level 0, Level I, Level II and Level III depending on their impacts and investment.
2. Whether the project impacts and recommendations are defined correctly as mentioned in Level I and II.
3. Whether the suggested mitigative measures are carried out as planned.
4. Any adverse or unpredicted environmental impacts due to the implementation of the projects.

Key environmental parameters:

The key environmental monitoring parameters are as follows (indicative list based on existing APDPIP sub-projects. These monitoring parameters will be the basis for the environmental audit.

Category: Livestock

Sub-project	*Impact*	*Mitigation Measure*	*Key Monitoring Parameter*
Dairy	Reduced grass productivity	Fodder cultivation Multiple fodder base (crop residue) Fodder management	Percentage of fodder needs met from cultivation (fodder cultivation, crop residue)
	Soil erosion	Regulated grazing Stall feeding	Presence and practice of regulations for grazing
	Reduced regeneration of tree species		Incidence of stall feeding
	Organic waste	Composting and use as manure	Incidence of composting practices

Sheep rearing	Reduced grass productivity	Regulated grazing	Presence and practice of regulations for grazing
	Soil compaction and erosion		
	Reduced regeneration of tree species		
Goat rearing	Reduced grass productivity	Regulated grazing Regulated lopping of fodder trees	Presence and practice of regulations for grazing
	Soil erosion		Presence and practice of regulations for lopping of trees for use as fodder
	Reduced regeneration of tree species		Incidence of stall feeding
Poultry	Loss of local breeds	Encourage rearing of local breeds	Percentage of local breeds

Category: Irrigation

Sub-project	*Impact*	*Mitigation Measure*	*Key Monitoring Parameter*
Bore well	Decline of water in existing open wells and bore wells	Minimum distance of 200 metres between bore wells	Decline of water in existing open wells and bore wells Density of bore wells
	Depletion of ground water	Ground water recharging practices Surface water harvesting practices (check dams, openwells, tanks, etc.) Water conservation measures (efficient irrigation and soil moisture conservation methods) Low water demanding crops (or adopt horticulture)	Existence and status of ground water recharging practices and surface water harvesting practices Existence and status of water conservation measures Extent of bore well irrigated area under water demanding crop

Farm pond / Open well	Harvesting of rain water	No mitigation necessary Ensure regular maintenance and desilting	
	Harvesting of surface water		
Desilting tank	Increased water holding capacity of tank and increase in irrigated area	No mitigation necessary	
	Ground water recharge due to increased percolation	No mitigation necessary	
	Availability of silt	Use silt on farm land to enhance fertility Afforestation and soil conservation in tank catchment to reduce future siltation	Record of afforestation and soil conservation in tank catchment

Category: Agriculture

Sub-project	*Impact*	*Mitigation Measure*	*Key Monitoring Parameter*
Crop cultivation (ground nut, paddy)	Water pollution due to application of fertilizers (Ground nut cultivation has positive impact of nitrogen fixation thus enhancing soil fertility)	Optimal application of fertilizers Use of organic fertilizers	Quality and quantity of fertilizer application Percentage of organic fertilizer use to total use
	Water pollution due to application of pesticides	Minimal application of chemical pesticides as part of IPM	Quality and quantity of pesticide application Extent of area under IPM
	Enhanced water depletion if source is ground water	Adopt water conservation practices	Extent of area under bore well irrigation Extent of area under water conservation practices

Horticulture, Vegetable farming	Water pollution due to application of fertilizers	Optimal application of fertilizers Use of organic fertilizers	Quality and quantity of fertilizer application Percentage of organic fertilizer use to total use
	Water pollution due to application of pesticides	Minimal application of chemical pesticides as part of IPM	Quality and quantity of pesticide application Extent of area under IPM
	Enhanced water depletion if source is ground water	Adopt water conservation practices	Extent of area under bore well irrigation Extent of area under water conservation practices
		Soil conservation measures required if land is undulating (eg: cashew cultivation)	Extent of area under soil conservation practices
Land development	Conversion of non-cropland to cropland	Soil and water conservation measures	Extent of area under soil and water conservation practices
	Soil loss during leveling for irrigation	Conserve top soil Apply silt if top soil is not adequate or is eroded If highly undulating adopt horticulture or agro forestry	Depth and quality of top soil
Pisciculture	Organic pollution from excess feed	Regulate feeding	Instances of fish kills
	Oxygen depletion due to overstocking	Regulate intensity of stocking	BOD levels in pond
	Loss of native fish species	Avoid exotic species	Presence of native fish species in pond

Category: Forest Products

Sub-project	*Impact*	*Mitigation Measure*	*Key Monitoring Parameter*
Non Timber Forest Produce collection	Complete removal of seeds, fruits and flowers will affect regeneration	Avoid 100 per cent removal of seeds, fruits and flowers to allow for regeneration	Regulation on extent and method of extraction in practice
	Lopping of branches for NTFP collection	Avoid lopping of branches. Collect fallen seeds, fruits, flowers	
	Over extraction affects life of tree and leads to loss of species	Training in sustainable harvesting Regulation of harvesting	Skill in sustainable harvesting

Category: Construction

Sub-project	*Impact*	*Mitigation Measure*	*Key Monitoring Parameter*
Shed for cattle	Positive impact on health and hygiene	No mitigation required	
	If large sheds are located near water source, can lead to contamination	Locate sheds at least 100 metres away from water sources Compost waste materials for use as fertilizer	Distance from water sources Incidence of water contamination from shed Presence of waste management practice
	Increased demand on building materials if large number of sheds are proposed	Use of energy efficient and environmentally sound building construction materials (eg: stabilized and mud blocks)	Number of sheds built using energy efficient and environmentally sound building construction materials

Check dam	Submergence of land due to water storage	Height below 10 metres Multiple smaller dams	Number of dams exceeding 10 metres in height
	Reduction in soil erosion	No mitigation required Silt management practice needs to be adopted	Existence of desilting practices and use of silt
	Improving ground water level		
	Reduction in siltation of downstream tanks		
	Water available for cattle, small vegetable garden, etc.		

Category: Micro-enterprises

Sub-project	*Impact*	*Mitigation Measure*	*Key Monitoring Parameter*
Catering (Mess)	Increased consumption of fuel wood impacting trees	Use of efficient smokeless cook stoves Use of LPG stoves	Percentage of catering facilities using efficient smokeless cook stoves
	Smoke from woodstoves impacts health		Percentage of catering facilities using LPG stoves
	Improper disposal of food waste causing pollution	Composting of food waste Use as animal feed	Practice for solid waste disposal
	Disposable serving utensils leads to increase in solid wastes	Use of biodegradable disposables (leaf plates) Use of reusable utensils (steel)	Incidence of use of non biodegradable disposables
Crafts	Reduction of natural resource (bamboo, tree leaves) if extraction is not sustainable	Training in sustainable extraction and efficient use	Skills in sustainable extraction and efficient use
Pottery	Removal of soil from tank bed functions as desilting	No mitigation required	

	Depletion of tree cover due to fuel wood use	Adopting efficient kiln design Use of alternative fuel resources (eg: rice husk)	Number of efficient kilns adopted Percentage of fuel needs met from alternative fuel resources
Garment making	No significant impact	No mitigation required	
Brick making	Loss of top soil if source is agricultural land	Use soil from tank bed as it helps in desilting Switch to stabilized blocks, concrete blocks, stone blocks, etc.	Number of units for making stabilized blocks, concrete blocks, etc. installed
	Depletion of tree cover due to fuel wood use	Adopting efficient kiln design Use of alternative fuel resources (eg: rice husk, coal) Fuel wood tree plantations	Number of efficient kilns installed Percentage of fuel needs met from alternative fuel resources
Leather (Animal skin processing)	Organic pollution (as processing is by traditional methods without chemical use)	Well managed waste disposal of solid and liquid wastes Locate at least 500 metres away from water sources and human habitation	Mechanism for waste disposal being practiced Distance from nearest water source
Marketing interventions	No significant impact	No mitigation required	

5.8 Management Information System

The relevance of the EMF is dependent on how responsive it is to the emerging sub-project context. The State and Regional Environment Agencies needs information on a continuous basis on the number and nature of sub-projects. The information requirements of the State and Regional Environment Agencies with regard to the sub-projects will be integrated into and provided through the MIS systems of APRPRP.

GIS can also be a powerful tool to identify and analyze project alternatives in terms of geographic location, overall design and technology choices. The application of this tool to the EMF can be explored.

5.9 Budget

No.	Particulars	Amt. (Rs. Mill.)	Amt. ('000 US $)
1	**SPMU: Institutional Arrangements + Other Costs**		
(a)	**Staff at SPMU** [1 Project Manager @ Rs. 25,000 per month and 2 Project Executives @ Rs. 15,000 per month]	**3.96**	**79.20**
(b)	**State Environmental Resource Group** [6 years x 2 meetings / year x Rs. 75,000 / meeting]	**0.90**	**18.00**
(c)	**Material production / printing costs** [Rs.1000 per copy x 1 copy / CC x 1500 CCs + 500 additional sets for Las and others]	**2.00**	**40.00**
2	**Environmental Agency - Costs**		
(a)	**Project team** [1 Manager @ Rs. 15,000 per month, 4 Executives @ Rs. 10,000 per month, 3 part-timers x Rs. 75,000 per year x 6 years]	**5.31**	**106.20**
(b)	**Technical Assistance (New tools + Scoping for full environmental assessment)** [Rs. 50,000 per year x 6 years]	**0.30**	**6.00**
(c)	**Training (incl. Material + All Cost of Resource Persons)**		
	(1) Orientation Workshop [2 nos. x Rs. 100,000 per Workshops]	**0.20**	**4.00**
	(2) Initial Training [1 session x 5 locations (3 districts/location) x Rs. 50,000 per session]	**0.25**	**5.00**

	(3) Refresher Training [2 sessions/yr x 5 locations (3 districts/location) x 5 years x Rs. 20,000 per session]	**1.00**	**20.00**
	(4)Follow-up of initial training by the ERG members [Travel cost of Rs. 6000 per visit x 16 district visits]	**0.10**	**1.92**
(d)	**Development of material for use by CCs** [Lumpsum for preparation w/o printing]	**0.10**	**2.00**
(e)	**Communication Material for Community for use by CCs/LAs** [Lumpsum for preparation w/o printing]	**0.20**	**4.00**
(f)	**Newsletter - Bimonthly** [Rs. 10,000 per issue x 6 issues/year x 6 years]	**0.36**	**7.20**
(g)	**Supervision** [2 visits / district /year x 6 years x 16 districts Rs. 10,000 per visit]	**1.92**	**38.40**
(h)	**Environmental Monitor**		
	(1) Baseline development [Lumpsum Rs. 50,000 for first year]	**0.05**	**1.00**
	(2) Recurring data / information collection [Lumpsum Rs. 10,000 per year x 5 years]	**0.05**	**1.00**
(i)	**Administration & Other Overheads** [Lumpsum Rs. 2.50 lakhs / year x 6 years]	**1.50**	**30.00**
3	**Role of ERG**		
(a)	**ERG Members** [16 Districts x 5 Members x 100 days/yr x Rs. 1000 per day x 6 years]	**48.00**	**960.00**

(b)	**Building ERG Teams** [16 Districts x 2 Members developing teams x 3 Executives / team x 200 days/yr x Rs. 500 per day x 5 years]	**48.00**	**960.00**
(c)	**Training by ERG members with DPMU & LAs**		
	(1) Initial Training [1 x 75 sessions x Rs. 35,000]	**2.63**	**52.50**
	(2) Refresher Training [2 times/yr x 75 sessions x 5 years x Rs. 20,000]	**15.00**	**300.00**
4	**Undertaking Environmental Audits** [2 audits x Rs. 15 lakhs / audit]	**3.00**	**60.00**
5	**Environmental Pilot Sub-projects** [2 sub-project types x 16 districts x 5 pilot sub-projects / type x $ 20,000 / sub-project (assumed average) x Rs. 50 per US $]	**160.00**	**3200.00**
	Total:	**294.82**	**5896.42**

Sub-project Classification Table

Level – 0 projects	**Level – I Projects**	**Level – II projects**
Bamboo skill development	Agarbathi making	Brick making
Rice Credit	Bamboo products unit	Bore well
Ice vending Unit	Irrigation canal	Sheep rearing
Mike set and lighting unit	Cashew horticulture	Minor irrigation tanks
Autorickshaw	Dairy	Lift irrigation
Oil engine, pipes and shed	Community vegetable growing	Check dams
Readymade Garments/ cloth business	Land development	
Rickshaws	Construction of sheds for animals	
Skill development on gum collection	NTFP collection	
Skill development on tailoring	Groundnut cultivation	
Business (Tamarind / Vegetable / Amla / Dal and oil / Ground nut / petty shop /fish	Food making	
Tent House	Day school	
Band set	Wood chips cutting	
Bullock carts	Creche /Child care centre	
Candle making unit	Residential School	
Construction of retaining wall	Poultry	
	Bullocks	
	Godown construction to store forest produce	
	Duck rearing	
	Granite metal making	
	Kitchen garden	
	Paddy cultivation	
	Sericulture	
	Coconut leaf sticks	
	Desilting tanks	
	Making fish traps	
	Community pisciculture	

Note: This listing is on the basis of CIF sub-project types received from the DPMUs in March 2002.

Criteria for Decision on Level on Environmental Assessment

Level-0

The type of natural resource used, impact on natural resource, if any, and explanation for categorizing each sub-project as Level-0 is given in the following table.

Sub projects	**Natural Resource Used**	**Remarks**
Bamboo skill development	Bamboo	Programme component is only training i.e., skill development. Training should include sustainable extraction of bamboo
Rice Credit	Nil	This involves only financial management and it is only a service
Ice vending Unit		It is a business proposition. Vendor needs to be educated on hygienic ice vending.
Mike set and lighting unit		Electricity is not a local resource. It is a business. Usage of energy efficient lighting should be encouraged
Autorickshaw	Diesel	Diesel is not a local resource. The number of autorickshaws proposed, even under different sub-projects, is not likely to be large. However, a check on the number is required.
Oil engine, pipes and shed	Diesel	Diesel is not a local resource. It is a service sector enterprise.
Readymade garments/ cloth business	Nil	No natural resource usage.
Rickshaws	Nil	It is a service sector enterprise using human labour.
Skill development on gum collection	Nil	Programme component is only training i.e., skill development. Training should include sustainable extraction of gum
Skill development on tailoring	Nil	Programme component is only training i.e., skill development.
Business (Tamarind / Vegetable / Amla / Dal and oil / Ground nut /petty shop /fish)	Nil	Programme component is marketing. May emphasize on sustainable extraction.
Tent House	Nil	Programme component is service.
Band set	Nil	It is a service sector enterprise.
Bullock carts	Nil	It is a service sector enterprise.

Candle making unit	Fuel wood	Insignificant fuel consumption because it is low temperature heating
Construction of retaining wall	Nil	Enhance soil conservation

Level – I (Environmental Review)

The natural resource impacted, potential positive impact and /or potential negative environmental impacts for sub-projects qualifying for environmental screening Level – I "Environmental Review" is given in the following table.

Sub Projects	**Natural Resource Impacted**	**Potential Positive Impacts**	**Potential Negative Environmental Impacts (minor/short-term)**
Agarbathi making	Human health	-	Impact on health from harmful chemicals if no protection
Day and Residential school	Human health	Improved health, if sanitation and drinking water provided	Adverse impact on health if sanitation and drinking water are not provided
Bamboo products unit	Bamboo	-	Over extraction of bamboo
Creche/ Child care centre	Health and hygiene	Improved health, if sanitation and drinking water provided	Adverse impact on health if sanitation and drinking water are not provided
Irrigation canal	Soil	If soil water conservation practices implemented	Enhanced soil erosion, water loss and water logging
Cashew horticulture	Land	-	-
Dairy	Grazing land and crop land	Improved fertilizer value of dung if composted Conserving fuelwood if biogas is used for cooking	Over grazing Adverse effect on regeneration Poor health if sanitation facility absent in cattle shed
Community pisciculture	Water	-	Exotic species of fish may harm native fish species Excessive feed may cause eutrophication in small ponds
Community vegetable growing	Soil	-	Use of pesticides

Land development	Land and soil	Conserves soil and moisture and prevents erosion	Wrong practices may lead to soil erosion and loss of moisture holding capacity
Construction of sheds for animals	Livestock population	Improved hygiene conditions	If no proper waste collection and disposal, poor sanitation results
NTFP collection	Trees and other plants	-	Over harvesting, affects regeneration, tree growth and health
Groundnut cultivation	Soil and water	Enhanced soil fertility	Pesticides use
Food making	Tree wood		Wood / Tree depletion
Wood chips cutting	Trees		If wood harvested non-sustainably or over extraction leads to tree depletion
Poultry	Soil	Poultry waste as manure	
Bullocks	Grazing land and crop land	Improved fertilizer value of dung Biogas for cooking leads to conserving fuelwood	Over grazing Adverse effect on regeneration of forests
Godown construction to store forest produce	Soil		Loss of top soil
Paddy cultivation	Soil and water usage	-	Use of pesticides Over irrigation leads to salinization
Coconut leaf stick	Tree health		Over harvesting of green leaves can adversely affect the tree

Criteria for sub-projects for Level – II (Limited Environmental Assessment)

The natural resource impacted, nature of resource depletion or degradation and potential adverse long-term environmental impact for a selected list of sub-projects which qualify for environmental screening, level-II "Limited Environmental Assessment" are given in table 3.4. Sub-projects, which qualify for level-II, are likely to have long-term adverse impact on natural resources, some of which could be irreversible (such as loss of biodiversity and decline in ground water level). Environmental screening under level-II requires data, field visits, consultation with village communities as well as experts.

Sub Projects	Natural Resource Impacted	Resource Depletion or Degradation	Potential Long-term
Brick making	Soil Wood or fuel	Loss of fertile soil Loss of tress	Loss of top soil
Bore well	Ground water	Ground water depletion	Loss of ground water
Sheep rearing	Grassland Forests	Loss of regenerating trees Lower grass production	Soil erosion
Minor Irrigation Tank	Water Soil Land	Loss of water Loss of soil for embankment Loss of land	Water submergence Enhanced soil erosion
Lift Irrigation	Water (Open well or Bore well)	Ground water decline if bore well Water level decline if open well	Loss of ground water
Check dams	Land and water	Prevents soil erosion Improved percolation of water	Land submergence

Level III (Environmental Impact Assessment)

There is a Level – III assessment that is for sub-projects, which are likely to have very serious negative impact on the environment, and for which an EIA will be required. So far no such sub-projects have been found in the APDPIP.

Appendix 5.3

General Guidelines for Screening of Sub-projects

Step I: Identify natural resources impacted by the sub-project

Identify the natural resources proposed to be used, the nature of impacts, including whether short or long-term impact, from implementation of the proposed sub-project.

Name of the sub project: ……..……

What is the natural resource to be impacted?[1]	Describe briefly if it is positive or negative impact[2]	Describe briefly if it is short term or long term impact[3]

Source of information and method:

Information on resources to be used and nature of impact could be obtained by discussion with village community, field visit and observation in a location where a similar project activity was implemented and finally by consulting the experts at the district level.

Examples of questions to guide identification of impacts on natural resources and health:

Questions	Examples
What resources will be used for installation or implementation of the sub-project?	Land submergence for minor irrigation tank Top soil for brick making Ground water for irrigation
What inputs are used if any for manufacturing or processing as part of the sub-project activity?	Diesel or electricity for pumping Chemicals for processing Tree leaves for fodder Fuel wood for brick making
What are the outputs of the sub-project?	Ground water percolation from check dam Compost from dairy
What is the waste generated if any?	Poultry waste from poultry Waste food from hotel
What are the impacts on health if any?	Drinking water contamination Exposure to smoke in kitchen

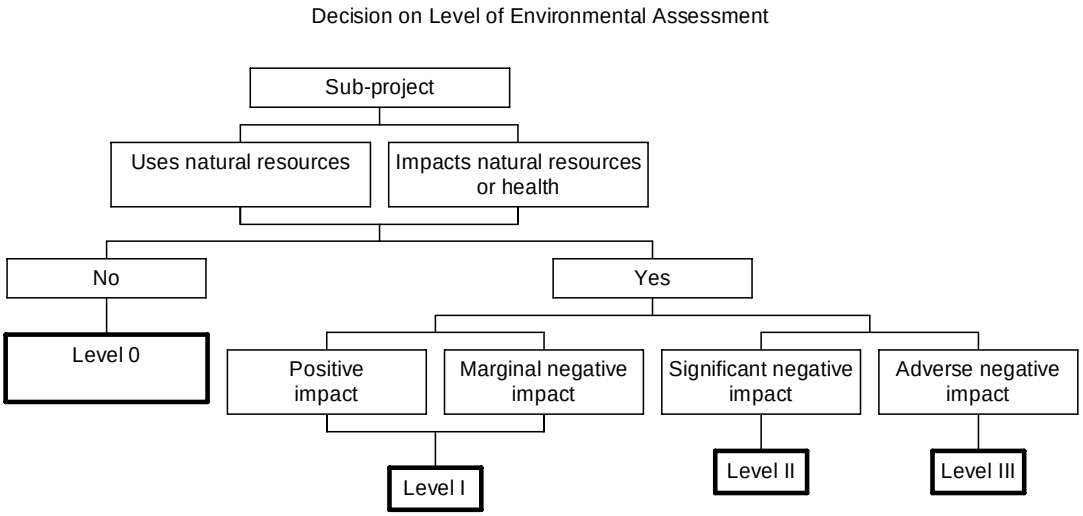
[1] Natural resources include: soil, air, ground water, surface water, grassland, forests, tree stems, medicinal plants etc.

[2] Positive impacts could include (soil and water conservation, fuel wood conservation) and negative impacts could include (increased soil erosion, damage to trees)

[3] Short term impacts could include: damage to trees or over grazing and long-term impact could include: soil erosion, ground water depletion etc.

Step II: Decision on level of environmental assessment

The decision on level of environment assessment to be adopted depends on the extent of dependence or use of natural resources, extent of impact on the resources, nature of impact such as short or long-term impact, possibility to mitigate the impacts. Use the decision flow chart to determine the level of environment assessment needed.



Three levels of environmental assessment are suggested:

Level 0: The proposed sub-project doesn't depend on or use any natural resource directly (such as water, forests, grazing land, soil, etc) and more importantly doesn't adversely impact any natural resource or health (such as pollution, ground water depletion, soil erosion, and loss of Biodiversity).

Level I: The proposed sub-project has either marginal or short-term impact on the natural resources or health. Even if a project has only positive or beneficial impact (such as soil and water conservation), it is necessary to ensure the positive impacts. Thus Environmental Review is suggested. Level I assessment is done by the CC.

Level II: If the proposed project has large adverse impact or irreversible or long-term negative impact (such as bore well leading to depletion of ground water), Level II assessment is suggested. This level could be termed as Limited Environmental Assessment. Level II assessment is done by the Environment Resource Group members.

Level III: If the proposed sub-project has a severe adverse environmental impact, that cannot be mitigated within a feasible timeframe and budget, Level III assessment is suggested. This level could be termed as Environmental Impact Assessment. Level III assessment is commissioned by the SPMU to a qualified independent agency in consultation with the Environment Agency.

Negative List of Sub-projects

The following list has been compiled based on the laws and regulations of the Governments of India and Andhra Pradesh and the Safeguard Policies of the World Bank.

It is recommended that the following sub-projects must not be supported in APRPRP:

Concerning Environmental Assessment

Any sub-project that is not screened for environmental assessment.

Concerning Forests, Forest Produce, Trees

Any sub-project that involves destruction, exploitation or removal of any wildlife from a sanctuary or destroys or damages the habitat of any wild animal or deprives any wild animal of its habitat within such sanctuary (except with a permit granted by the Chief Wild Life Warden).

Any project that involves setting fire to a sanctuary, or kindling any fire or leaving any in a sanctuary, in such manner as to endanger such sanctuary.

Any sub-project that involves the use of chemicals, explosives, or any other substances which may cause injury to, or endanger, any wildlife in a sanctuary.

Any sub-project involving procurement of livestock to be kept in or within five kilometers of a sanctuary without immunization of the animals against communicable diseases.

Any sub-project that involves taking for grazing any livestock in a sanctuary without getting it immunized.

Any sub-project that involves grazing of animals in the plantation area in the sanctuary.

Any sub-project that involves grazing of goats in a sanctuary.

Any sub-project that is located in or involves a National Park.

Any sub-project that involves the following in a reserved forest without the written permission of the Divisional Forest Officer:

- Set fire, kindle fire or leave any fire burning in such manner as to endanger such forest
- Kindle, keep or carry any fire except at seasons and conditions specified by the Divisional Forest Officer

- Trespass, pasture cattle or allow cattle to trespass in the plantation areas
- Grazing of goats
- Cause any damage, either willfully or negligently in felling or cutting any trees or dragging any timber
- Fell, girdle, lop, tap or burn any tree or strip off the bark or leaves from or otherwise damage the same
- Quarry stone, burn lime or charcoal
- Collect or subject to any manufacturing process, any forest produce
- Clear or break up or plough any land for cultivation or for any other purpose
- Hunt, shoot, fish, poison water or set traps or snares
- Damage, alter or remove any wall, ditch embankment, fence, hedge, or railing, or
- Remove any forest produce

Any sub-project that involves the following in reserved and protected forests:

- Brick making involving extraction (for soil or fuel) from reserved or protected forests
- Agriculture involving chemical pesticide use without an IPM approach
- All infrastructure activities without permission from the Forest Department and all activities that require permission from the Forest Department for which such permission has not been taken

Any sub-project that involves the collection, moving and sale of forest produce without a permit from the Divisional Forest Officer and without a plan for sustainable extraction.

Any sub-project that involves selling or purchasing or curing or otherwise processing or collection or storage or transport of any minor forest produce without the required registration and permission from the Divisional Forest Officer.

Any sub-project in a scheduled area that involves selling or purchasing or curing or otherwise processing or collection or storage or transport of any minor forest produce unless it is for sale to or purchase from the Girijan Cooperative Corporation, Ltd.

Any sub-project that involves any of the following without prior written permission of the Forest Officer in public premises (any area under the control of Government Department and includes road sides; premises of institutions and public buildings, public gardens, porambokes, beroon lands, Panchayat lands, irrigation project sites and canal banks, tank bunds, tank spread and foreshores, etc.):

- Felling, girdling, lopping, tapping or burning of any trees
- Stripping off the bark or collecting leaves or otherwise damaging a tree
- Removing any produce from such trees existing in public premises
- Damaging, altering, removing any fence or live hedge fence

Any sub-project that involves the felling of the following ‘prohibited trees’ without a permit:

1. Vepa (*Azadirachta indica*)
2. Ippa (*Madhuka latifolia*)

3. Mamidi (*Mangifera indica*)
4. Kunkudu (*Sapindus emarginatus*)
5. Mushti (*Strychnos nuxvomica*)
6. Chinta (*Tamarindus indica*)
7. Panasa (*Artocarpus integrifolia* and *Artocarpus hirsuta*)
8. Karaka (*Termalia chebula*)
9. Tuniki (*Diospyros malonaxylon*)
10. Kaniga (*Pongamia glabra*)

Any sub-project that involves the cutting of the following reserved trees, if the tree does not exceed 120 cm. in girth at 1.3 metres height from ground level:

1. Bandaru (*Adina cordifolia*)
2. Billudu (*Chloroxylon swietenia*)
3. Jittegi (*Dalbergia latifolia*)
4. Yepi (*Hardwickia binata*)
5. Raktachandanam (*Pterocarpus santalinus*)
6. Yegisa (*Pterocarpus marsupium*)
7. Chandanam (*Santalum album*)
8. Salwa (*Shorea robusta*)
9. Kusum (*Schleichera trijuga*)
10. Teku (*Tectona grandis*)
11. Maddi (*Terminalia tomentosa*)
12. Konda Tangedu (*Xylya dolabriformis*)

Any sub-project involving logging operations or purchase of logging equipment.

Any sub-project that involves the installation, erection or operation of a saw mill (a mechanical contrivance for sawing, cutting or conversion of timber with the aid of electrical or mechanical power) for cutting, converting or sawing of timber without a licence from the Divisional Forest Officer. Also, any sub-project that involves the setting up fresh saw mills within a distance of 5 km. from the boundary of any forest under the control of the Forest Department shall be granted.

Any sub-project which involves making charcoal, or cutting or cause to cut trees for the purposes of making charcoal, without the previous written permission of the Divisional Forest Officer concerned.

Concerning Coastal Areas

Any sub-project that involves setting up and expansion of fish processing units including warehousing (excluding hatchery and natural fish drying in permitted areas) in the Coastal Regulation Zone (CRZ) (*The Government of India declares the coastal stretches of seas, bays, estuaries, creeks, rivers and backwaters which are influenced by tidal action up to 500 metres from the High Tide Line (HTL) and the land between the Low Tide Line (LTL) and the HTL as CRZ*).

Any sub-project that involves discharge of untreated wastes and effluents from industries and human settlements in the CRZ.

Any sub-project in the CRZ that involves land reclamation, bunding or disturbing the natural course of sea water with similar obstructions, except those required for control of coastal erosion and maintenance or cleaning of waterways and channels; for prevention of sandbars; and except for structures for prevention of salinity ingress and for sweet water recharge.

Any sub-project that involves mining of sands, rocks and other substrata materials in the CRZ areas, except those raw materials not available outside the CRZ areas.

Any sub-project that involves harvesting or withdrawal of ground water and construction of mechanisms for the same within 200 metres of the high tide line. In the 200 metres to 500 metres zone it shall be permitted only when done manually through ordinary wells for drinking, horticulture, agriculture and fisheries.

Any construction activity between the low tide line and the high tide line.

Concerning Dams

Any sub-project involving a dam (existing or new) of 10 metres high or more.

Concerning Agriculture

Any agriculture sub-project that does not incorporate Integrated Pest Management (IPM) approaches.

Any agriculture sub-project that intends to use banned pesticides, agrochemicals in WHO Classes IA, IB and II.

Any sub-projects that involve manufacture or sale, stocking or exhibiting for sale or distribution of any insecticide, without a licence.

Any sub-project involving intensive aquaculture involving harvest of fish/shrimp seed from the wild, pumping of saline water, conversion of prime agricultural land into aquaculture ponds, use of chemical inputs in natural wetlands and coastal habitats.

Concerning Cultural Property

Any sub-projects that will damage non-replicable cultural property will be permitted.

Concerning Water

Any sub-project that involves sinking any well (other than any well for public drinking purpose and hand pump for public or private drinking water purpose) in the vicinity of a

public drinking water source within a distance of 250 metres, without permission from the Andhra Pradesh Water, Land and Trees Authority (APWLTA), and if the well is to be used with a power driven pump, without permission from APTRANSCO.

Any sub-project that involves sinking a well without the permission of the APWLTA in areas declared as overexploited by the APWLTA.

Any sub-project that involves sinking of a bore well in a dark mandal unless it is for the purpose of providing drinking water.

Any sub-project that involves purchase of a rig without registering the machinery with the APWLTA.

Concerning Land

Any sub-project that involves brick manufacturing in areas where the soil is prone to erosion and depletion.

Any sub-project for constructions within a radius of 10 kilometres of coal based thermal power plants not involving use of bricks made of fly ash.

Any sub-project involving sand mining in I, II and III order streams except for local use in villages or towns bordering the stream (refer to Andhra Pradesh Water, Land and Trees Rules, 2002 given in Chapter 2 of this EA Report for further details).

General Guidelines for Environmental Assessment of Sub-Projects

The general guidelines are applicable to any sub-project area and have been suggested specifically to cater to the needs of assessment of those sub-projects not covered in the Appendix 6.4.

Level I - Environment Review

Environment Review will involve seeking information on the resources to be used and impacted, type or nature of impact, what indicators could be used to assess impacts, can the impacts be measured, if the impacts are negative can the adverse impacts be minimized or avoided.

Source of Information and Methods:

Information needed (as given in the format below) could be obtained from

i) SHG/CIG members (and village community or farmers or artisans),
ii) field visit to a location where a similar project has been implemented,
iii) reference to technical literature and
iv) experts in the relevant field at the district level.

Given the wide range of potential projects and impacts, it is difficult to suggest specific methods. However, example of the types of impacts, indicators for assessing the impacts and method for assessment are given in Appendix I (at the end of the section).

It is very important to obtain the opinion and perspective of local community or persons who are likely to be impacted by implementation of project.

Format for Level I (Environmental Review)

Sub project: ……..…….

	Information required on	*Record observations here*
1. Resources to be used	What resources will be used for the sub-project (for initiating the sub-project, during implementation of the sub-project, etc.)? Ex: soil, tree leaves, groundwater, fuel *Discuss with community*	
2. Resources to be impacted	What resources will be impacted? Ex: soil, ground water, open well water, tree leaves, grass, etc. *Discuss with community*	
3.Type of impact	What type of impact: ▪ Positive or negative ▪ Depletion of resources or degradation of resource ▪ Long-term or short-term *Discuss with community and project staff*	
4. What are the indicators of impact?	What indicator can be used? *Discuss with project staff* *Refer technical literature*	
5. Quantification of impact - Is it possible? - If no, opinion of village community	Can the impact be measured, if yes, what can be measured *Discuss with community*	
6. If impact is positive, what needs to be done to ensure it?	What activities or practices should be stressed to ensure positive impacts *Discuss with community and project staff*	
7. If negative impact, is it possible to mitigate?	Possibility to minimize or avoid negative impacts *Discuss with community and project staff*	
8. If yes, what mitigation measure could be suggested?	Improved technology / practices *Discuss with community and project staff*	
9. Indicators for mitigation measures	List indicators for improved technology / practices *Discuss with community and project staff*	

Level 2 - Limited Environmental Assessment (LEA)

If the sub-project needs Level 2 assessment, adopt the following procedure, which is only an elaboration of the procedure adopted for Level 1. Under this approach more detailed or intensive quantitative methods could be adopted to evaluate the potential impacts, to enable decision on the project. Projects that need Level 2 assessment are likely to have significant and possibly long-term or irreversible impact on natural resources. Thus, the impacts have to be quantitatively assessed and mitigation measures integrated into the recommendations on the sub-project. If the impacts are long-term and irreversible, an alternate sub-project providing the same or similar service or benefit needs to be suggested.

Source of Information and methods:

As the impacts are likely to be adverse and long-term, systematic and scientific measurement of impacts may be necessary. The types of impacts, examples of indicators and methods for different resources are given in Appendix-I at the end of this section. Methods could include:

i) Participatory approach
ii) Field visit and observation
iii) Technical or scientific measurement of indicators
iv) Consultations with experts

Format for Level II (Limited Environmental Assessment)

Sub-project……..…….

	Information required on	Record observations and measurements here
1. Resources to be used	What resources will be used for the sub-project (for initiating the sub-project, during implementation of the sub-project, etc.)? Ex: soil, tree leaves, groundwater, fuel *Discuss with community*	
2. Resources to be impacted	What resources will be impacted? Ex: soil, ground water, open well water, tree leaves, grass, etc. *Discuss with community*	
3. Type of impact	What type of impact: ▪ Positive or negative ▪ Depletion of resources or degradation of resource ▪ Long-term or short-term *Discuss with community and project staff*	
4. What are the indicators of impact?	What indicator can be used? *Discuss with project staff* *Refer technical literature*	
5. Measurement of indicators - Methods	Refer to methods suggested for similar indicators in appendix or to other similar projects with similar impacts.	
6. Quantification of impacts	Use methods suggested as above to measure the indicators *Consult community*	
7. If impact is short term, what is the mitigation measure suggested?	Mitigation measures *Discuss with community and project staff*	
8. If impact is long-term, what is the mitigation measure needed?	Mitigation measures *Discuss with community and project staff*	
9. If difficult to mitigate what alternate practice could be suggested	Alternate sub-project or technology/practice *Discuss with experts*	

Appendix I:

Natural Resources to be Impacted, Nature of Impact and Indicators

Natural resource and health	Impact	Indicator	Methods
Soil	Soil erosion	Gravel exposure Gully formation	Field observation
	Soil extraction	Depth and area of soil extraction	Observation and measurement
	Soil conservation	Soil conservation measures implemented	Observation of presence of soil conservation structures
	Soil pollution	Presence of toxic chemicals	Laboratory test
Water	Ground water depletion	Depth of bore wells	Measurement of water level
	Loss of water in open well	Depth of water in open wells	Measurement of water level
	Water pollution affecting health	Presence of coliform bacteria	Laboratory analysis
	Water logging	High water table (water below soil surface)	Field Observation
	Availability of drinking water	Human effort for collecting water Presence of taps	Survey Survey
Forest	Forest loss/ clearing forests	Area of forest cleared or converted Number of trees and species felled	Area estimate Counting or estimation of trees felled
	Over lopping of trees	Percentage of trees with crown damage	Counting of damaged trees / ha
	Loss of biodiversity	No of species and species wise density Trees Medicinal plants	Counting of number of plants of different species per hectare.

	Absence of regeneration	Percentage of trees in tree girth range < 5 cm, 5-10 cm, > 10 cm.	Counting tree seedlings in different tree girth classes
Grass land	Over grazing	Presence or absence of green grass cover Grass productivity	Field observation.
	Soil erosion	Gravel exposure Sheet erosion Gully erosion	Field observation
Fuel wood for cooking	Smoke affecting women & childrens' health	Presence of smoke in kitchen Respiratory diseases	Field visit, observation and discussion with women
	Loss of trees	Trees felled or damaged	Field visit observation and discussion with women Field studies & measurement of damaged trees
		Purchase / commercial selling	Household survey
Sanitation	Water borne diseases	Number of toilets Percentage of households with toilets Absence of drainage for household and cattle shed waste	Field visit and survey

Appendix 5.6

Environment Assessment: Summary of Findings and Recommendations

(To be included in the CIF Sub-project Proposal Appraisal Sheets)

Sub-project name: _____

Level of Assessment: _____

Assessment done by: _____

Date of Assessment: _____

For Level 1 and Level 2 Assessments, please fill the following:

<table>
<tr><td colspan="3">Findings of environment assessment</td></tr>
<tr><td>Resource Impacted</td><td colspan="2"></td></tr>
<tr><td>Type of impact
(Please Tick)
Short term / Long term
Resource depletion / degradation
Waste generation / pollution</td><td colspan="2">Type of impact
(Please describe)</td></tr>
<tr><td rowspan="2">Current status of resource</td><td colspan="2">Level of degradation: High/Medium/Low</td></tr>
<tr><td colspan="2">Level of availability: High/Medium/Low</td></tr>
<tr><td colspan="3">Recommendation on sub-project based on environment assessment</td></tr>
<tr><td>Approved</td><td colspan="2"></td></tr>
<tr><td>Approved with mitigation measure</td><td>☐ Mandatory
☐ Desirable
☐ Optional</td><td>Give details of mitigation measure</td></tr>
<tr><td>Not approved due to long term or adverse impact</td><td colspan="2">Alternate sub-project suggested (give details)</td></tr>
<tr><td>General observations</td><td colspan="2"></td></tr>
</table>

Appendix 5.7

Terms of Reference for Environment Agency (EA)

1. To design an Environmental Management Framework that will:
   - Contribute to the goal of poverty alleviation by helping the project to better address the linkages between environmental degradation and poverty; and
   - Prevent environmental degradation as a result of either cumulative effects of many small sub-projects that individually have negligible impact or impact of individually harmful sub-projects
   - Facilitate pro-active sub-projects that can be expected to lead to improvements in local environmental quality

2. To identify criteria to screen the sub-projects into one of the three levels of environmental studies – Environment Review (ER) to be done at the village level by the Community Coordinator, Limited Environmental Assessment (LEA) to be done at the DPMU level by the Regional Environment Agency and Environment Impact Assessment (EIA) to be done by the State Environment Agency.

3. To develop the checklists for various likely sub-project components for the ER and LEA and Terms of reference for the EIA

4. To train the CCs, Social Organizers and DPMUs in ER and raising awareness of the communities and activists, through appropriate Training of Trainers

5. To train the Regional Environment Agency at DPMU level and DPMUs in LEA and follow-up; the trained and certified (certified by EA) members of these Environment Resource Groups would conduct the LEA based on the LEA guidelines

6. To provide cost estimates for each and every sub-project that is referred by the DPMU to SPMU for the EIA; further decision to go for the EIA or not is based on the cost of the EIA and the benefit of the sub-project

7. To conduct the EIA for the sub-projects referred for EIA directly or through appropriate resource agency/persons (under separate contracts)

8. To build generic capacity for environmental management at the local, district and state levels and develop indicative pro-active sub-projects that have a positive bearing on the local environmental quality

9. To audit the EMF's application for the sub-projects on a sample basis on a six monthly basis

10. To monitor the environmental conditions to ensure that the EMF remains responsive to environmental concerns

11. To provide technical support on environmental issues as requested by the SPMU and/or DPMUs

12. To participate and cooperate with an External Environmental Audit of APDPIP after two years

Appendix 5.8

Role of the Environment Resource Group (ERG)

ERG members are expected to play the following roles and commit the days as follows –

Training

The ERG members will be the core group of trainers who will be trained by CEE (mandatory) and who will in turn train the CCs through main and refresher training programmes on Screening and Level 1 Assessment.

Assessment

The ERG members will conduct the level 2 assessment.

The ERG will contribute to the environmental monitor. This requires reporting on environmental news and issues to the SEA as and when the relevance and need is identified.

Awareness

The ERG will organize (with financial support from APDPIP) and /or assist the CCs in organizing environmental awareness programmes for the community (focusing on sub-projects that contribute to environmental conservation). The assistance to the CCs is essentially in an advisory role.

Monthly review of sub-projects

The ERG will, on invitation by the DPMUs, participate in the monthly review of the CIF sub-projects.

Each ERG member will, on invitation by the DPMU, visit two sub-projects each month.

Audit of sub-project processes

The ERG will, on invitation by the DPMUs, participate in random audit of sub-projects.

Days of Involvement

1. Undergoing Training etc.	5 to 8
2. Organizing Training	4 to 16
3. Assessment (Level 2)	10 to 30
Compulsory involvement	19 to 54 days
4. Community Awareness Programmes	4 to 10
5. Monthly review of sub-projects	8 to 12
6. Audit of sub-project processes	4 to 8
Additional optional days of involvement	16 to 30 days

Support required for ERG from DPMU

Monthly Meetings

A meeting between the ERG and the DPMU has to be convened once every month by the DPMU. The convener for the meeting is the CIF/Livelihoods/M&L coordinator at the DPMU. The PD is the chairperson of the meeting.

Information

The ERG must have regular access to the CIF status of CIF sub-projects in the district.

Appendix 5.9

Sample Environmental Assessment Tools for Sub-projects

List of Tools

Level	Project Themes	Sub Project titles	Satus
Level II	Rural industry	1. Brick making	Tool provided
		2. Leather (Animal skin and carcass processing)	Yet to be developed
	Irrigation projects	3. Bore well for irrigation	Tool provided
		4. Check dam	Yet to be developed
	Livestock rearing	5. Sheep rearing	Tool provided

Level	Project Themes	Sub Project titles	Status
Level I	Rural industry	6. Bamboo products making unit	Tool provided
		7. Food making unit	Tool provided
	Land development and Agriculture	8. Land development	Tool provided
		9. Cashew horticulture	Tool provided
		10. Vegetable growing	Tool provided
		11. Ground nut cultivation	Tool provided
		12. Paddy cultivation	Tool provided
	Livestock rearing	13. Dairying	Tool provided
	Forest product collection	14. NTFP collection	Tool provided
	Projects involving Civil works	15. Construction of sheds for animals	Tool provided

EA Tool for Brick making

1. Level of assessment: Level II (LEA)

2. Resource to be impacted and environmental impact

Resource	*Potential impact – long-term*
Soil/land	1. Loss of top soil 2. Depletion of fertile soil 3. Land degradation by creation of huge pits – making the land unsuitable for other use
Trees	Depletion of tree cover and reduction in the number of fuel wood trees

3. Potential scenarios

Scenario – 1	Rice Husk is the source of fuel for bricks	Chart - 1
Scenario – 2	Wood is the source of fuel for bricks	Chart - 1
Scenario – 3	Coal cinder is the source of fuel for bricks	Chart - 1

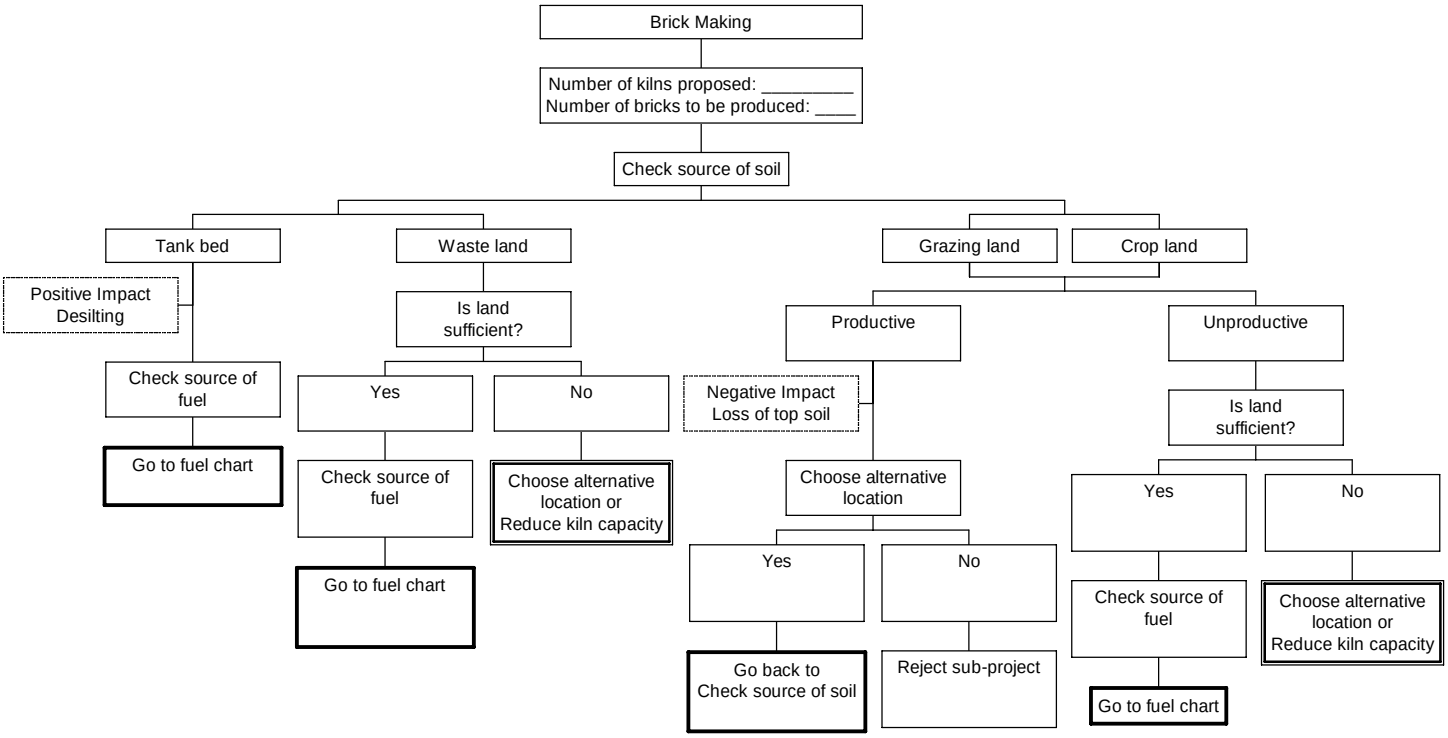
4. Baseline / Bench mark information

Natural resources			Access / Regulation to existing resource use	Status / current availability
Relevant	Use	Data		
1. Number of brick making units	-	-- Nos		
2. Soil for Bricks • Tank Bed • Grazing land suitable for bricks • Crop/Agricultural Land	 Yes/No Yes/No Yes/No	 .. ha .. ha .. ha	Yes/No, If yes what? e.g., Restrictions to excavate soil for brick making	Adequacy of soil for bricks Adequate/ inadequate/ severe shortage
3. Fuel for brick burning • Wood • Coal • Rice husk • Others - specify	 Yes/No Yes/No Yes/No Yes/No	 … ha* -- tons	Yes/No If Yes, what? e.g., Restrictions on tree cutting from forest land	Shortage of fuel for bricks Adequate/ inadequate/ severe shortage

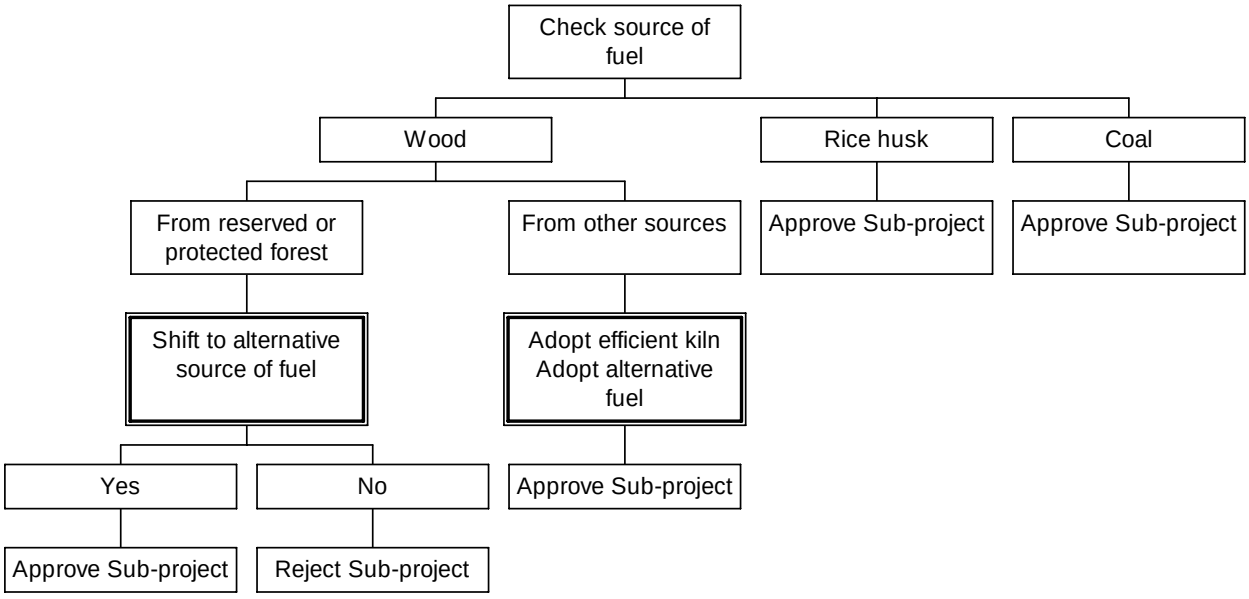
* Hectares of forest or any other land having trees that is used for brick making

5. Location and Implications

Resource	Location	Implications/ impacts
Source of Soil	Tank bed	Tank desilting has positive impact
	Grazing Land	Creation of huge pits makes land unsuitable for any other activity
	Agricultural Land	Creation of huge pits makes land unsuitable for any other activity
Source of Wood	Forest Land	Depletion of tree cover and reduction in the number of trees
	Non-forest Land	



Fuel Chart (part of Decision Tree for Brickmaking)



6. Mitigation measures

Practice	Impacts	Mitigation		Indicator of mitigation
		Improved	Alternate	
Brick Burning	Depletion of fertile soil	Fuel efficient kilns for burning	Use of stabilized blocks / concrete blocks / stone blocks etc	No. of efficient kilns installed No. of stabilized block machines in use No. of houses built using alternate methods
Tree felling	Depletion of trees or forests		Use of alternate fuel like rice husk / Coal Cinder Grow trees / plantations	No. of trees planted Ha of plantations raised

EA Tool for Irrigation Bore well

1. Level of Assessment: Level –II (LEA)

2. Resource to be impacted and environmental impacts

Resources	Potential impact – long term
Ground Water	Ground water in existing open wells and bore wells could decline, ultimately drying up the well. Depletion of groundwater permanently, thus borewell water need to be most efficiently used.

3. Potential Scenarios for bore well project in villages

Scenario - 1	Bore wells already exist in the village	CHART- I
Scenario - 2	No bore wells in the village, and bore wells will be drilled for the project	CHART- II

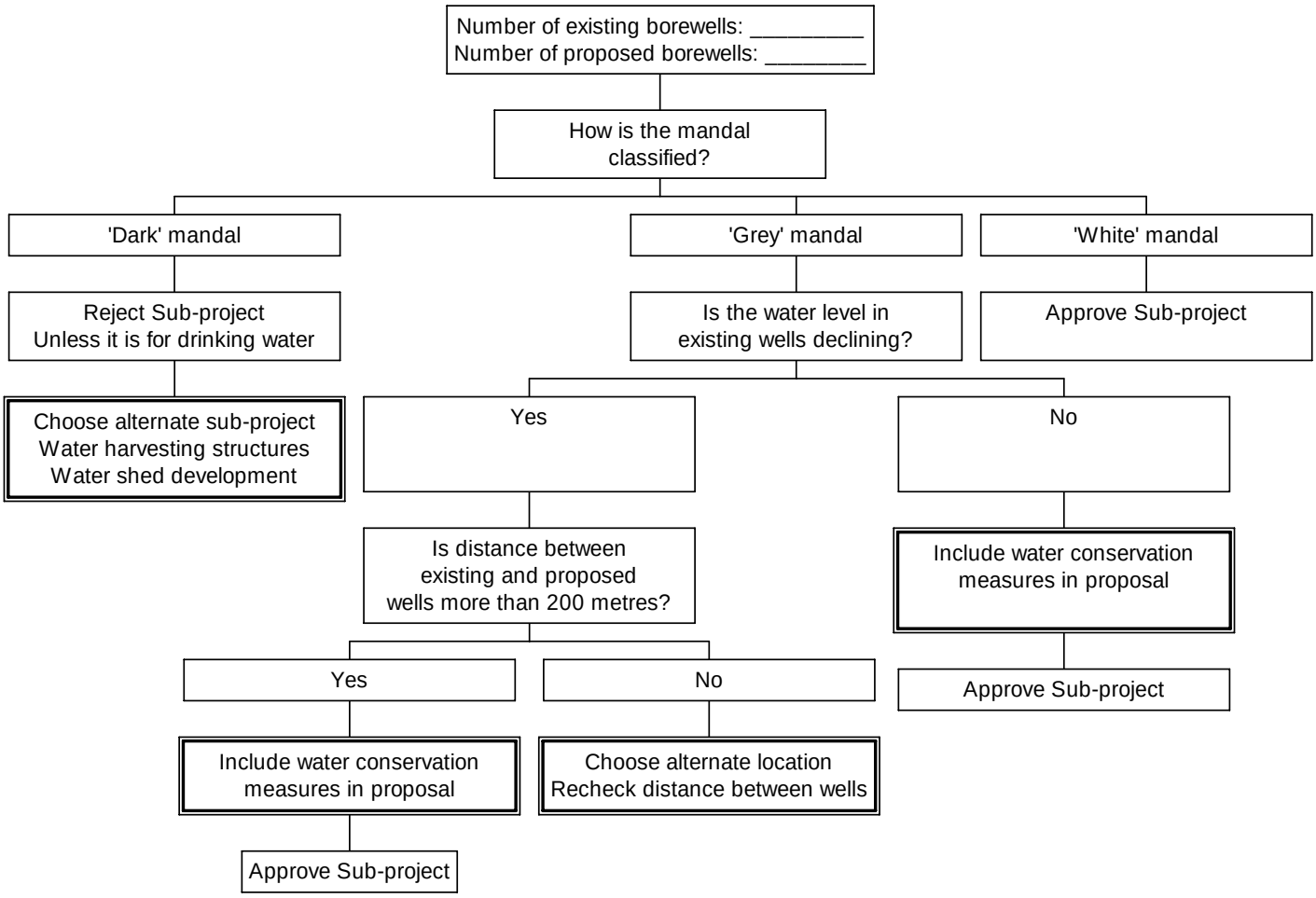
4. Baseline/Bench Mark information

Area/Existing resource	Status of resources	Data
Number of borewells in the locality	Ground water availability in the area	Depth m Yield gallons/hour
Total irrigated land		
Tank	----- No.	… ha
Open Well	----- No.	… ha
Stream	----- No.	… ha
Borewell	----- No.	… ha
Others	----- No.	… ha

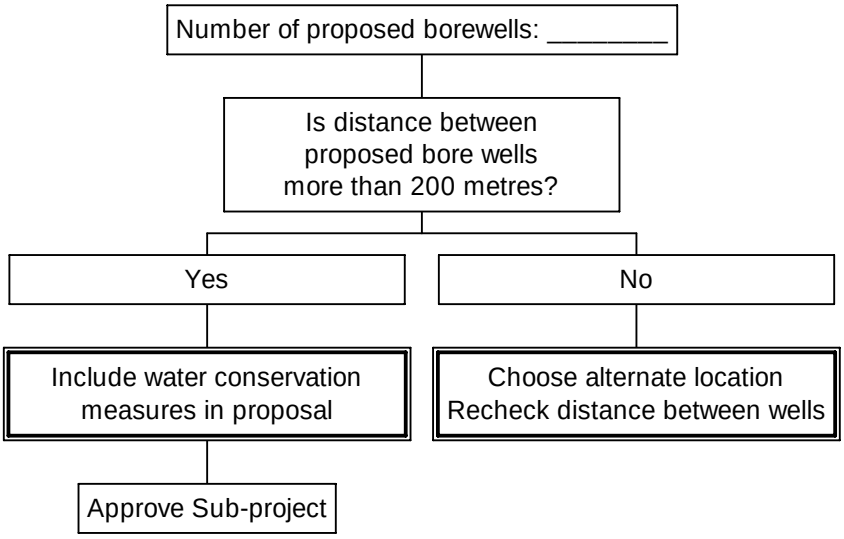
5. Impacts and indicators

Impacts	Indicators	Corrective measures
- Ground water depletion affecting neighbouring wells - Competition to drinking water source	- Depleting ground water level - Objections from neighbouring water source users	- Alternate location - Recharging of ground water - Harvest surface water by other methods (Check dams, open wells, tanks etc.)

Scenario 1: Borewells present in village



Scenario 2: Borewells not present in village



6. Mitigation measures

Practice	Impacts	Mitigation		Indicator of mitigation
		Improved	Alternate	
- Borewell drilling	- GW depletion	- GW recharge techniques - Better utilisation of water (sprinklers) - Grow low water demand crops - Equitable water sharing	- Use other techniques of water harvest (small tanks/check dams etc.) - Regulate cropping pattern - Switch over to horticulture crops	-Improved ground water level

EA Tool for Sheep Rearing

1. Level of Assessment: Level II (LEA)

2. Resources to be impacted and Environment impact

Resources	*Potential Long term impact*
Agricultural Land	Reduced Grass productivity in bunds
Grazing Land	Reduction in grass productivity and soil erosion
Forest Land	Reduced future tree population and canopy opening

1. Potential Scenarios for sheep rearing project in Villages

Scenario – 1	No grassland or grazing land in the village	Chart I
Scenario – 2	Grassland or grazing land available in the village	Chart II
Scenario – 3	Forestland available in the village used for grazing	Chart III

2. Benchmark Information

Resource	Status of resource	Data	Method
Livestock Population	Bullocks Cow Buffaloes Sheep Goat Total	…. No.s …. No.s …. No.s …. No.s …. No.s …. No.s	Records or census
Grazing Land in village (non-forest) Area -- ac	Level of degradation Grass coverage Grass productivity Extent of erosion Exposure of gravel Presence of gully	High / Medium / Low High / Medium/ Low High/ Medium / Low High/ Medium/ Low High/ Medium/ Low High/ Medium/ Low	Field observation PRA
Is there forest land		Yes/No	PRA
Is it used for grazing		Yes/No	PRA
If Forest Land used for grazing Area -- ac	Level of degradation Presence of seedlings of key species on forest Option 1 No. of seedlings in < 5 cm tree girth class No. of seedlings in > 5 -10 cm tree girth class No. of seedlings in > 10 cm tree girth class Option 2 Height of the tree < 2 m Height of the tree < 2 - 5 m Height of the tree < 5 m	High / Medium / Low Present /absent …. No.s …. No.s …. No.s …. No.s …. No.s …. No.s	Field observation and PRA Measurement Measurement

3. Features of the proposed project

Number of families proposed for sheep rearing	No. of families
Total number of sheep proposed for the project	…No.s
Source of grazing land proposed	Farm Land ...Acre Public grazing land ….Acre Forest Land ….Acre
Source of tree fodder proposed	Open lands …….Acre Forest Land …….Acre Crop land …….Acre
Grazing density (No. of sheep/goats/ha of grazing land) - Current - Current + proposed	 ……. No. /Acre ……. No. /Acre

Location of grazing land for proposed project

Resource	**Location**	**Potential impacts**
Grazing Land	Forest land	- Damage to tree seedlings
	Grassland	- Reduce grass cover or productivity - Enhance Soil Erosion

Scenarios:

1. Grazing land available (non-forest land)
2. Forestland is the potential grazing land
3. No grazing land available

Basic Decision Guidelines

Scenario 1: Grazing land available (non-forest land)

Assess productivity of grazing land or carrying capacity. The following parameters level of degradation, grass coverage, grass productivity and extent of erosion are observed. Rank the status of resources as high, medium or low. For example, if the land has gully then high, gravel exposed then medium and no visible indicators of erosion low has to be assigned. Then sum the values to get an aggregate value. If the value is < 5 then the potential degradation is less and therefore the sheep rearing could be taken up, if the value is between 5 and 8 then the potential degradation is medium and appropriate mitigation measures are to be taken up for undertaking sheep rearing. If the value is >8 then mitigation measures are to be adopted before sanctioning the project.

	High	Medium	Low
Level of degradation	3	2	1
Grass coverage	3	2	1
Grass productivity	3	2	1
Extent of Erosion	3	2	1

Suggestions:

1. Hygienic conditions of the sheds should be maintained
2. Sheep need grazing land. If no grazing land the sheep rearing is not possible and therefore dedicated land is necessary

4. Mitigation Measures

Practice	Mitigation/corrective action		Mitigation; Indicators
	Improved practice	Alternate practice	
Open grazing	Regulate grazing	Stall feeding of tree leaves (at least partially)	- Area under regulated grazing - No. of families adopting stall feeding

Scenario 2: Forest is the potential grazing land

If the sheep is grazing on forestland, then the productivity of the land, provisions under the forest act need to be considered for allowing them to graze on forestland. Rank the following parameters are to be observed for approving the sheep-rearing project. Then sum the values to get an aggregate value. If the value is < 5 then the potential degradation is less and therefore the sheep rearing could be taken up, if the value is between 5 and 8 then the potential degradation is medium and appropriate measures are to be taken up for undertaking sheep rearing. If the value is >8 then mitigation measures are to be adopted before sanctioning the project.

	High	Medium	Low
Level of degradation	3	2	1
Grass productivity	3	2	1
Seedling density	3	2	1
Tree height	3	2	1

Record data on height and girth of some key tree species in the forest

Species	Height			Girth (at 130 cm)		
	< 2m	2 -5 m	> 5m	< 15 cm	15-30 cm	> 15 cm
Species 1	..No (% total)	..No (% total)	..No (% total)	..No (% total)	..No (% total)	..No (% total)
Species 2	..No (% total)	..No (% total)	..No (% total)	..No (% total)	..No (% total)	..No (% total)
Total	..No (% total)	..No (% total)	..No (% total)	..No (% total)	..No (% total)	..No (% total)

The proportion of < 2m under height and < 15 cm girth is high, then the grazing should be regulated strictly to avoid damage to regeneration. 50% or more individuals of these categories then the regeneration is considered as good.

Suggestions

1. Forestland is generally not permitted for use as grazing land. If used leads to adverse effect on forest regeneration
2. If possible using forest as grazing land must be avoided
3. If use of forests is necessary, ensure that grazing density is less or grazing is regulated

7. Mitigation measures/technology

Practice / Location	Mitigation/corrective action		Mitigation; Indicators
	Improved practice	Alternate practice	
Forest	Regulate grazing	- Ban grazing	Dedicated land for grazing

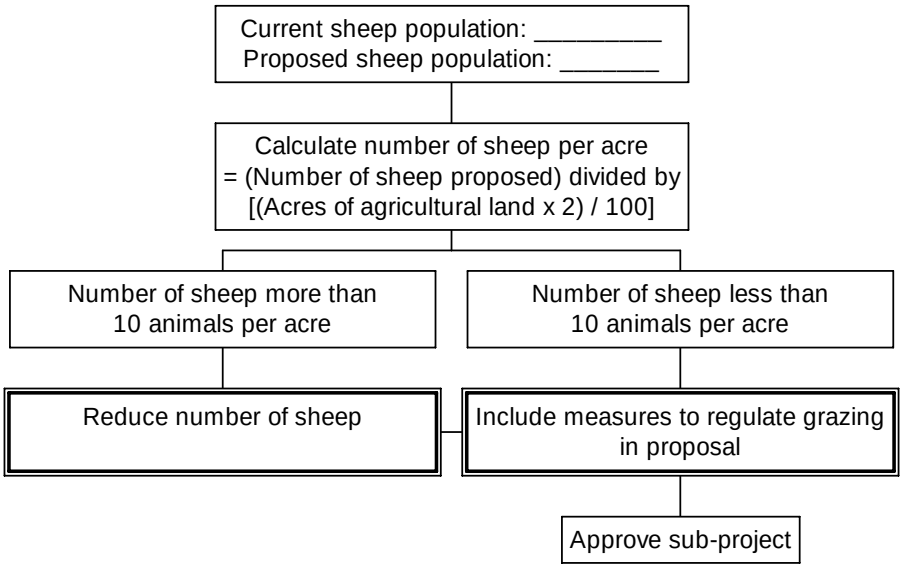
Scenario 3: No dedicated grazing land available

Sheep cannot be stall fed completely. Sheep rearing needs dedicated grazing, particularly during crop season. During non-crop or summer season sheep can graze on cropland. If no dedicated grazing land is available, sheep rearing is not possible.

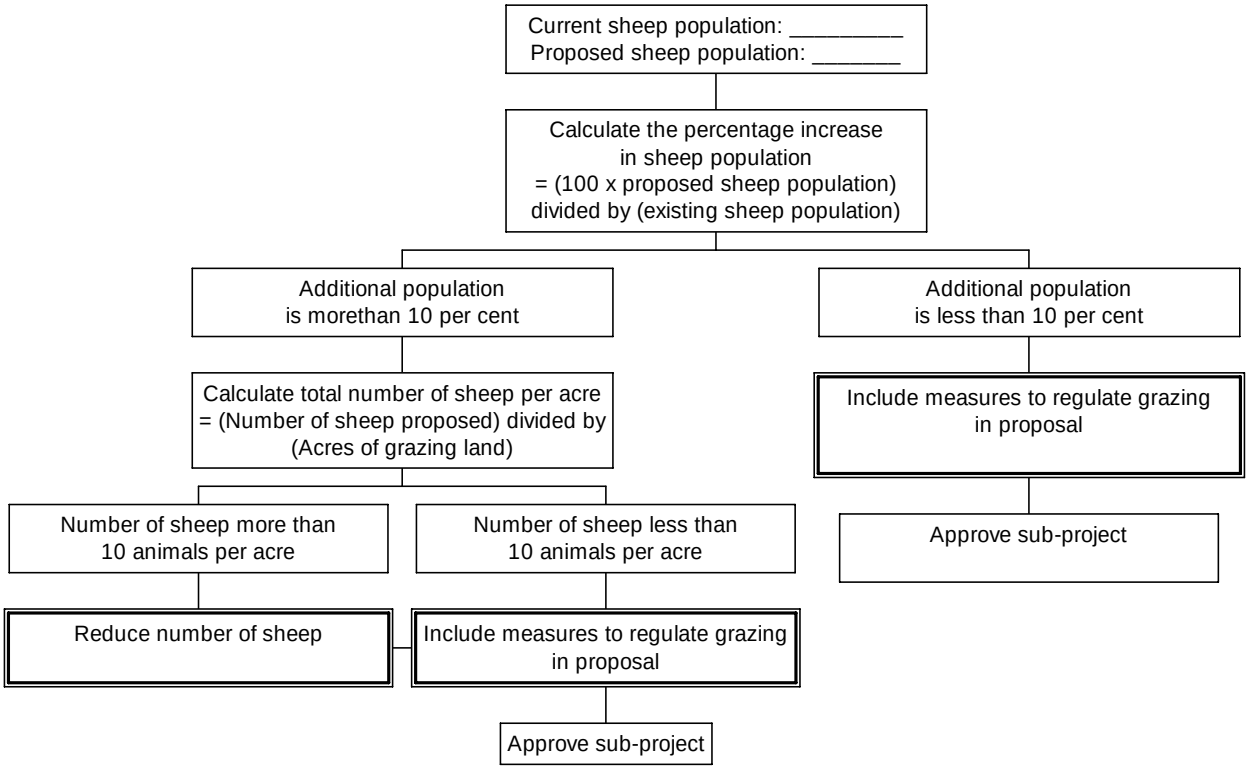
Feasibility of mitigation measures

Practice	Inputs needed	Feasibility
Regulation of sheep grazing	No cash inputs	Feasible if participatory approach adopted
Ban grazing in forest	Guard / Community protection needed	Feasible if participatory approach adopted

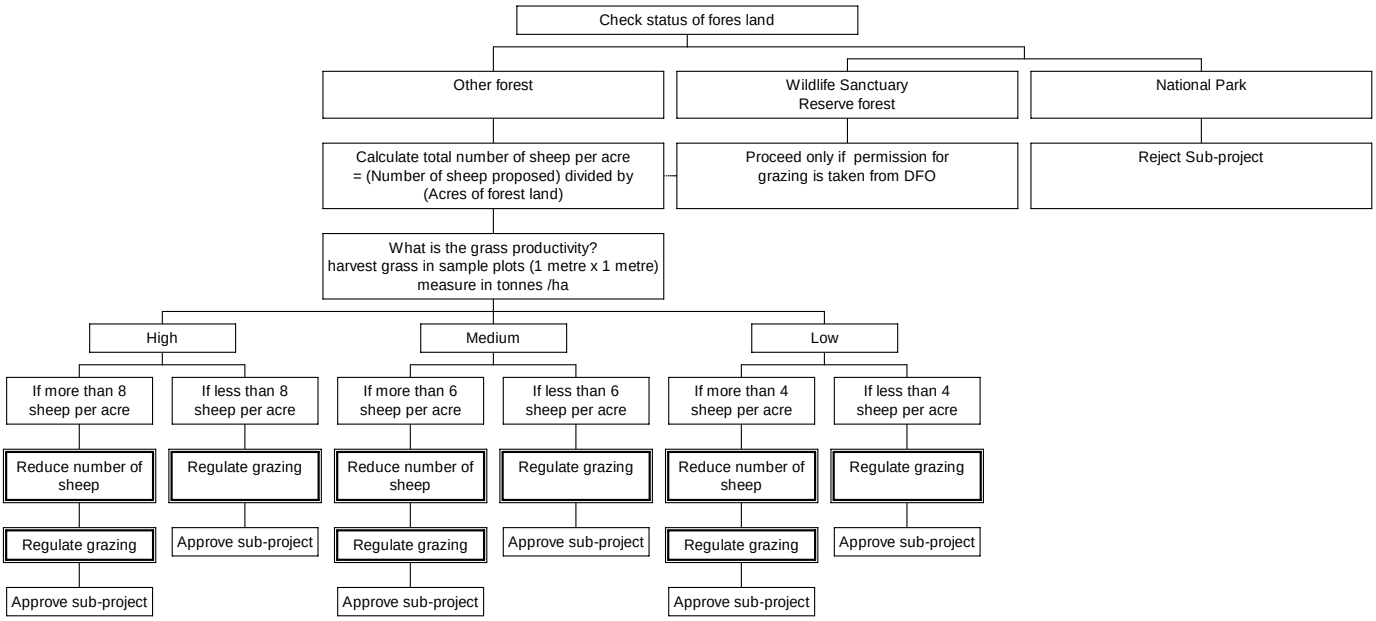
Scenario 1: No grazing land available
agriculture land (fallow fields, field bunds) will be grazing land



Scenario 2: Grazing land available



Scenario 3: Forestland is potential grazing land

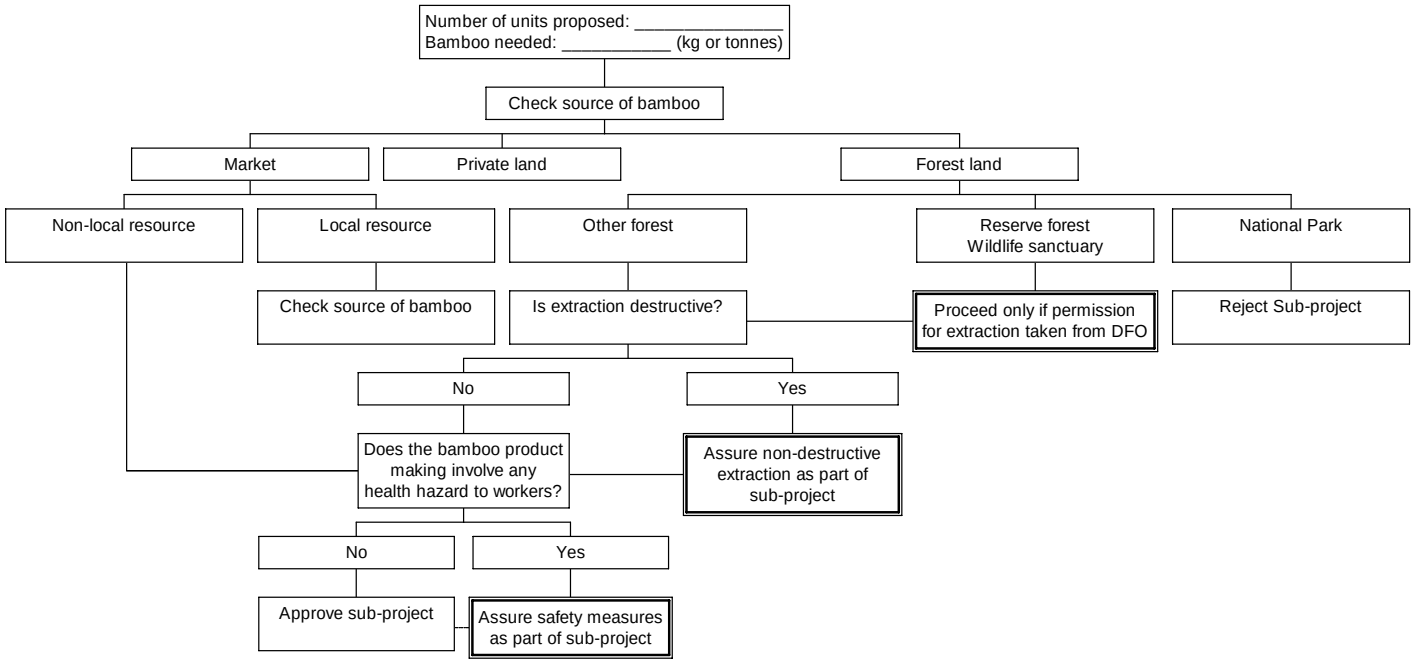


EA Tool for Bamboo Products Unit

1. Level of assessment: Level I

2. Resources impacted and environmental impact

Resource	**Potential Impact – long term**
Bamboo	Reduction in bamboo resource if not properly extracted

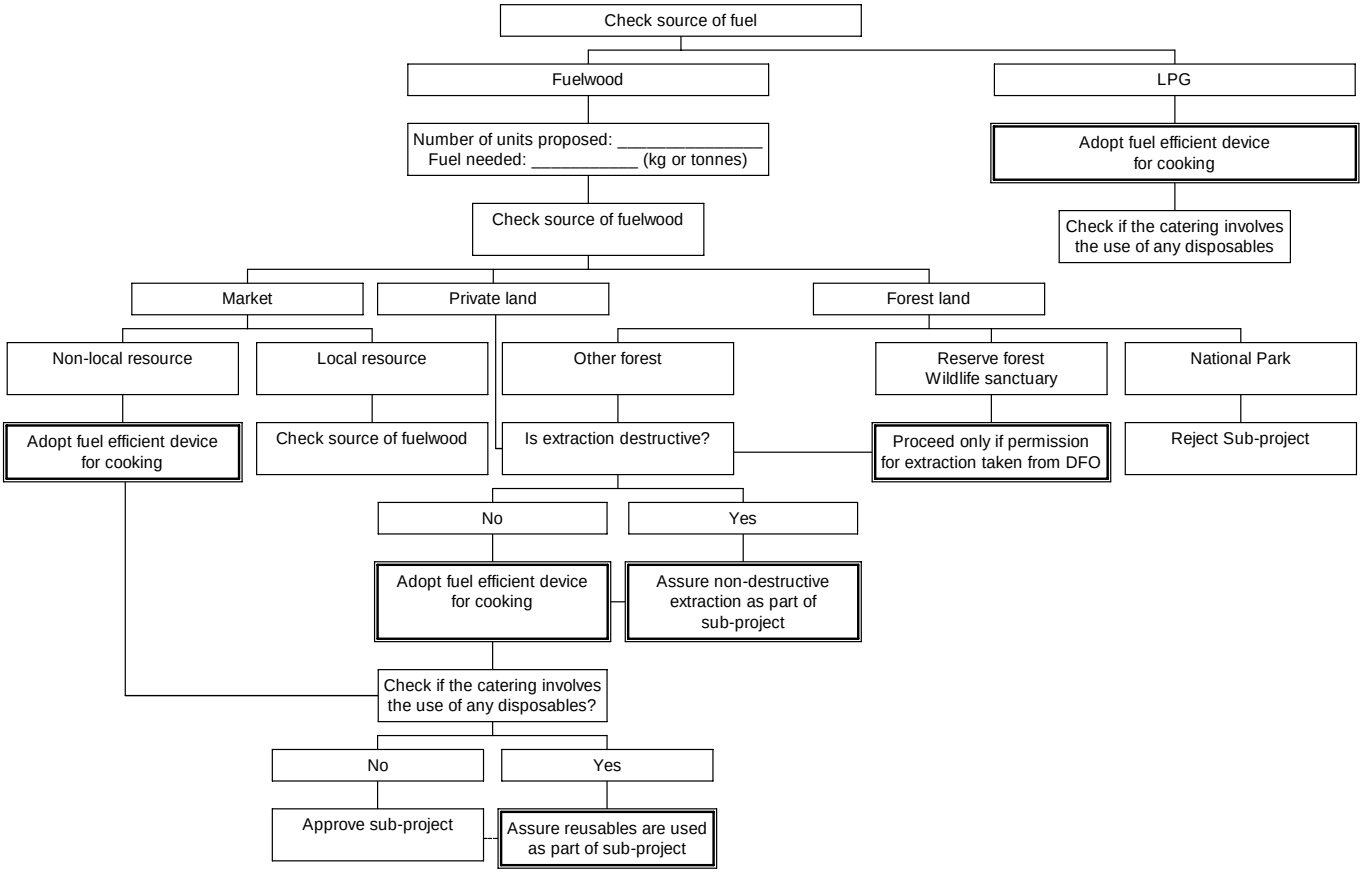

Number of units proposed: _____
Bamboo needed: _____ (kg or tonnes)
Check source of bamboo
Market
Private land
Forest land
Non-local resource
Local resource
Other forest
Reserve forest
Wildlife sanctuary
National Park
Check source of bamboo
Is extraction destructive?
Proceed only if permission for extraction taken from DFO
Reject Sub-project
No
Yes
Does the bamboo product making involve any health hazard to workers?
Assure non-destructive extraction as part of sub-project
No
Yes
Approve sub-project
Assure safety measures as part of sub-project

EA Tool for Food Making Unit

1. Level of assessment: Level I

2. Resources impacted and environmental impact

Resource	**Potential Impact – long term**
Firewood	Reduction in firewood resource if not properly extracted

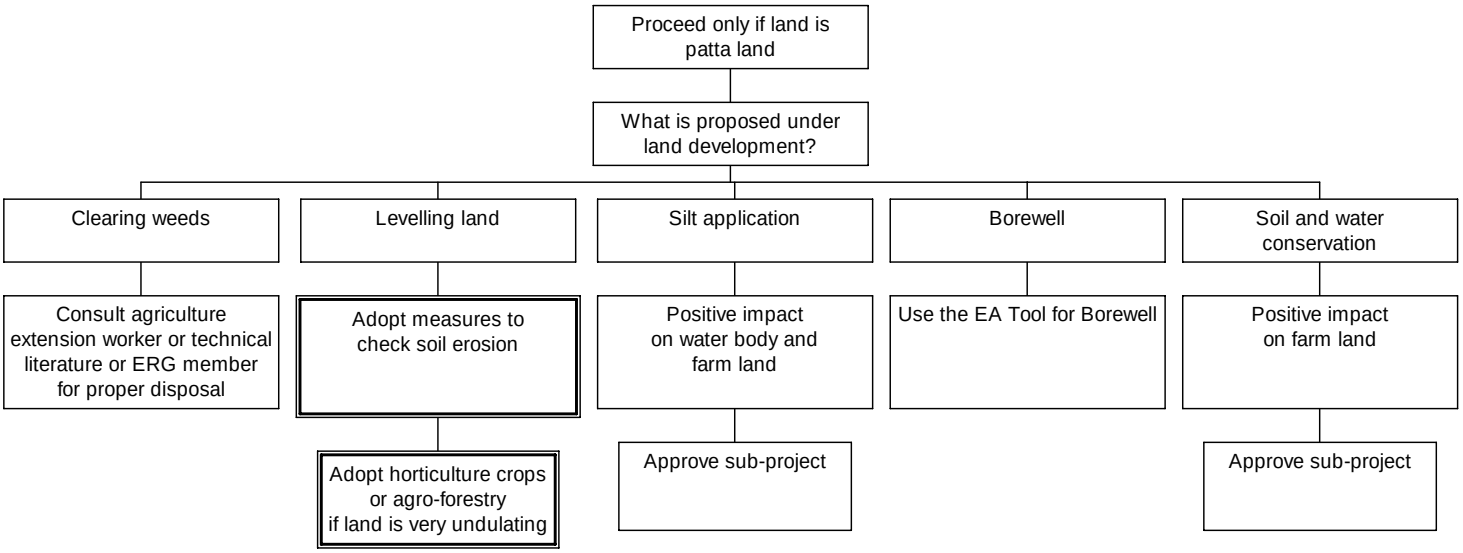

Check source of fuel
Fuelwood
LPG
Number of units proposed: _____
Fuel needed: _____ (kg or tonnes)
Adopt fuel efficient device for cooking
Check source of fuelwood
Check if the catering involves the use of any disposables
Market
Private land
Forest land
Non-local resource
Local resource
Other forest
Reserve forest Wildlife sanctuary
National Park
Adopt fuel efficient device for cooking
Check source of fuelwood
Is extraction destructive?
Proceed only if permission for extraction taken from DFO
Reject Sub-project
No
Yes
Adopt fuel efficient device for cooking
Assure non-destructive extraction as part of sub-project
Check if the catering involves the use of any disposables?
No
Yes
Approve sub-project
Assure reusables are used as part of sub-project

EA Tool for Land Development

1. Level of assessment: Level I

2. Impact potential and environmental impact

Resource impacted	**Potential Impact – long term**
Land and water	Large scale cultivation may lead to water shortages in the area for other crops Water pollution due to application of fertilizers and pesticides

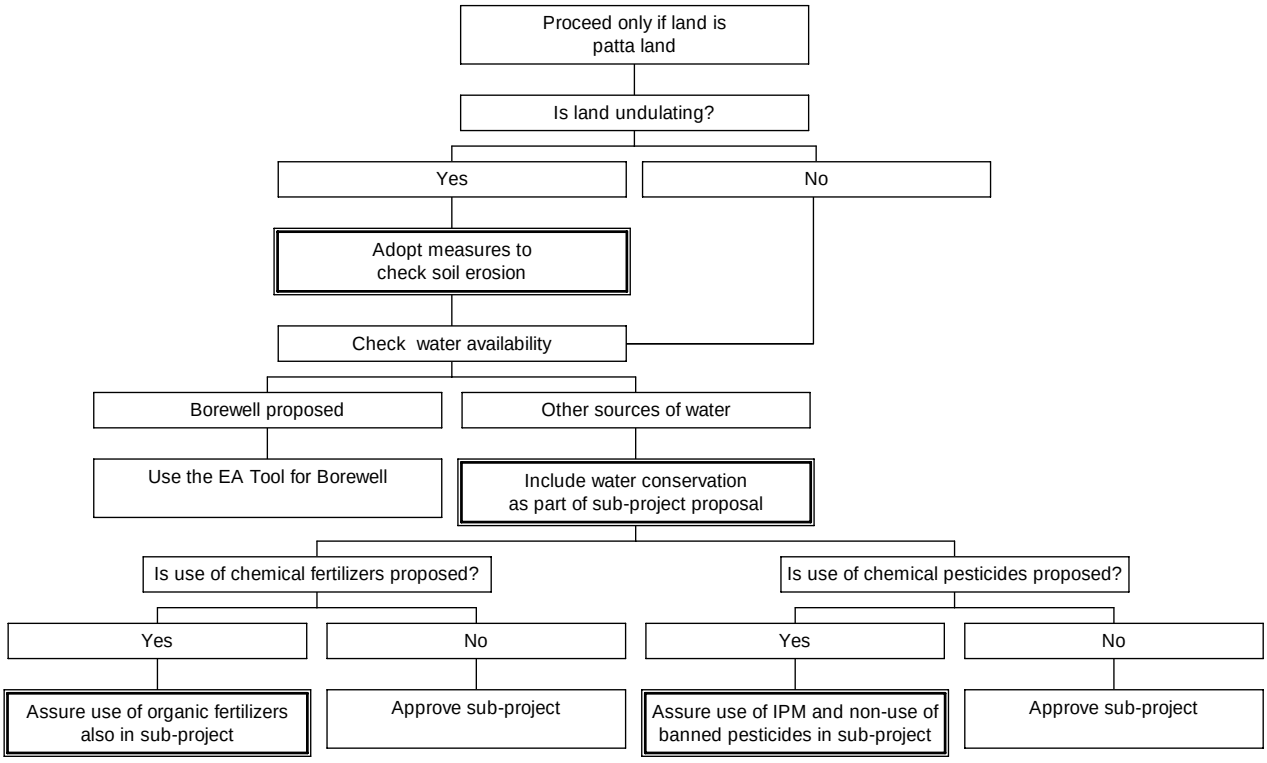

Proceed only if land is patta land
What is proposed under land development?
Clearing weeds
Levelling land
Silt application
Borewell
Soil and water conservation
Consult agriculture extension worker or technical literature or ERG member for proper disposal
Adopt measures to check soil erosion
Positive impact on water body and farm land
Use the EA Tool for Borewell
Positive impact on farm land
Adopt horticulture crops or agro-forestry if land is very undulating
Approve sub-project
Approve sub-project

EA Tool for Cashew Horticulture

1. Level of assessment: Level I

2. Resources Impacted and environmental impact

Resource	**Potential Impact – long term**
Land and water	Land degradation if no measures are taken for checking erosion

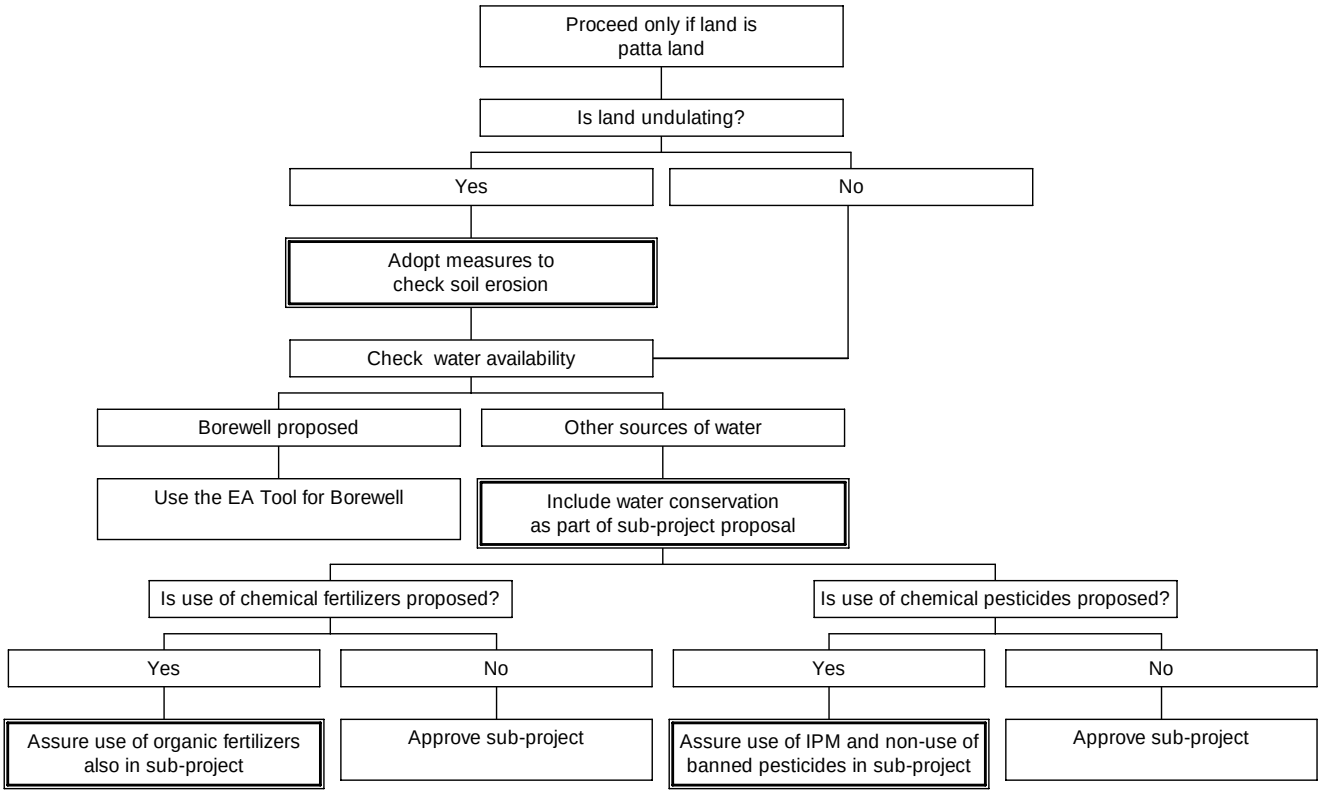

Proceed only if land is patta land
Is land undulating?
Yes
No
Adopt measures to check soil erosion
Check water availability
Borewell proposed
Other sources of water
Use the EA Tool for Borewell
Include water conservation as part of sub-project proposal
Is use of chemical fertilizers proposed?
Is use of chemical pesticides proposed?
Yes
No
Yes
No
Assure use of organic fertilizers also in sub-project
Approve sub-project
Assure use of IPM and non-use of banned pesticides in sub-project
Approve sub-project

4. EA Tool for Vegetable Growing

1. Level of assessment: Level I

2. Resources impacted and environmental impact

Resource	**Potential Impact – long term**
Land and water	Large scale cultivation may lead to water shortages in the area for other crops Water pollution due to application of fertilizers and pesticides

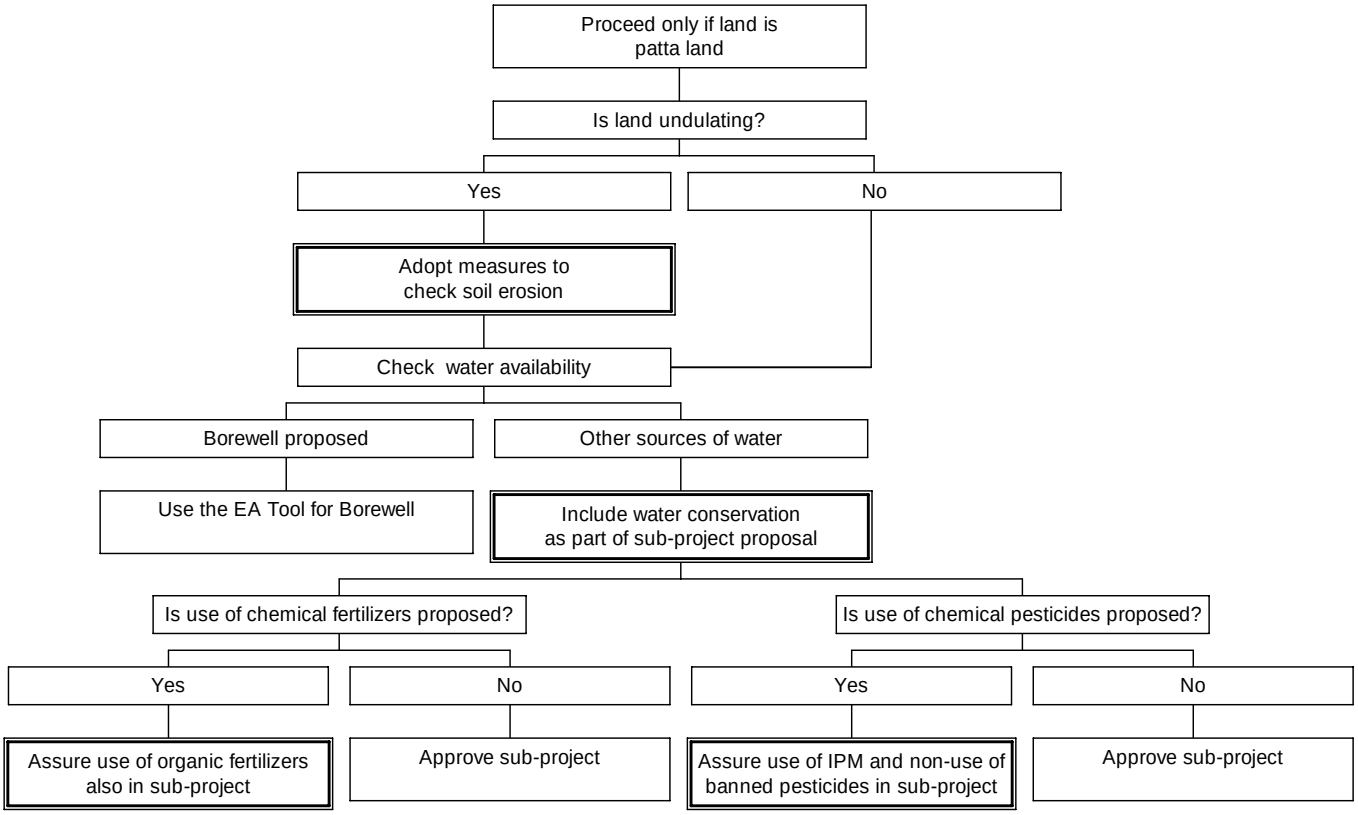

Proceed only if land is patta land
Is land undulating?
Yes
No
Adopt measures to check soil erosion
Check water availability
Borewell proposed
Other sources of water
Use the EA Tool for Borewell
Include water conservation as part of sub-project proposal
Is use of chemical fertilizers proposed?
Is use of chemical pesticides proposed?
Yes
No
Yes
No
Assure use of organic fertilizers also in sub-project
Approve sub-project
Assure use of IPM and non-use of banned pesticides in sub-project
Approve sub-project

5. EA Tool for Groundnut Cultivation

1. Level of assessment: Level I

2. Resources impacted and environmental impact

Resource	**Potential Impact – long term**
Land and water	Large scale cultivation may lead to water shortages in the area for other crops Water pollution due to application of fertilizers and pesticides

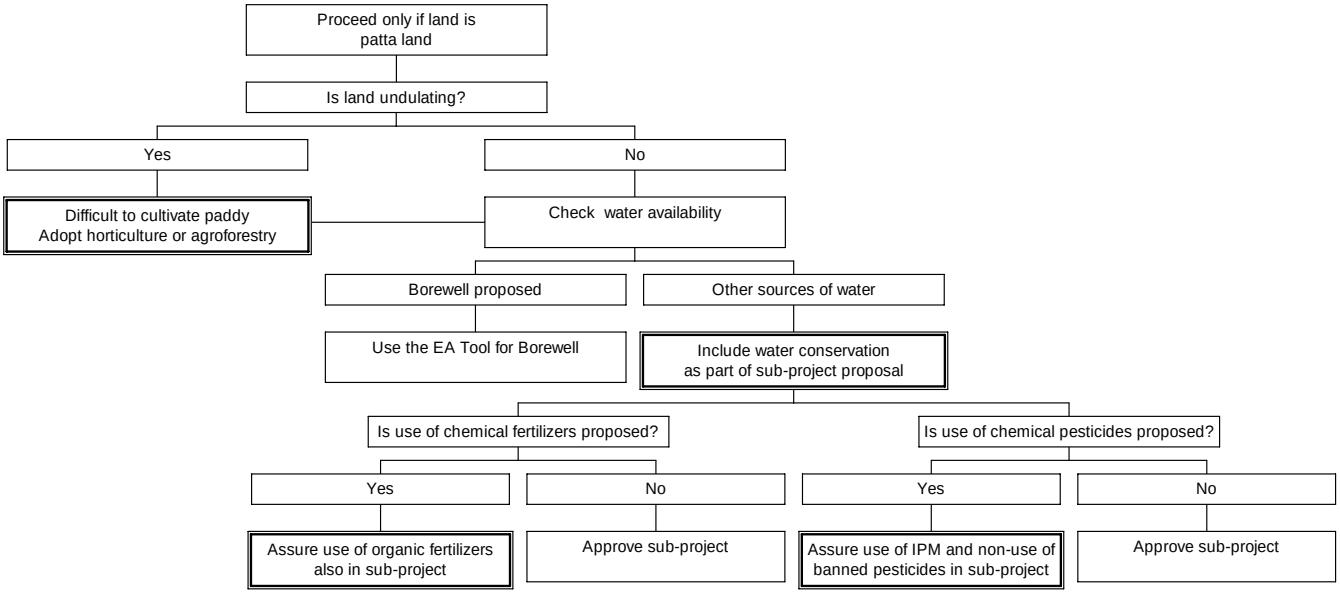

Proceed only if land is patta land
Is land undulating?
Yes
No
Adopt measures to check soil erosion
Check water availability
Borewell proposed
Other sources of water
Use the EA Tool for Borewell
Include water conservation as part of sub-project proposal
Is use of chemical fertilizers proposed?
Is use of chemical pesticides proposed?
Yes
No
Yes
No
Assure use of organic fertilizers also in sub-project
Approve sub-project
Assure use of IPM and non-use of banned pesticides in sub-project
Approve sub-project

EA Tool for Paddy Cultivation

1. Level of assessment: Level I

2. Resources impacted and environmental impact

Resource	**Potential Impact – long term**
Land and water	Large scale cultivation may lead to water shortages in the area for other crops Water pollution due to application of fertilizers and pesticides


Proceed only if land is patta land
Is land undulating?
Yes
No
Difficult to cultivate paddy
Adopt horticulture or agroforestry
Check water availability
Borewell proposed
Other sources of water
Use the EA Tool for Borewell
Include water conservation as part of sub-project proposal
Is use of chemical fertilizers proposed?
Is use of chemical pesticides proposed?
Yes
No
Yes
No
Assure use of organic fertilizers also in sub-project
Approve sub-project
Assure use of IPM and non-use of banned pesticides in sub-project
Approve sub-project

EA Tool for DAIRYING

1. Level of Assessment: Level I (Environment review)

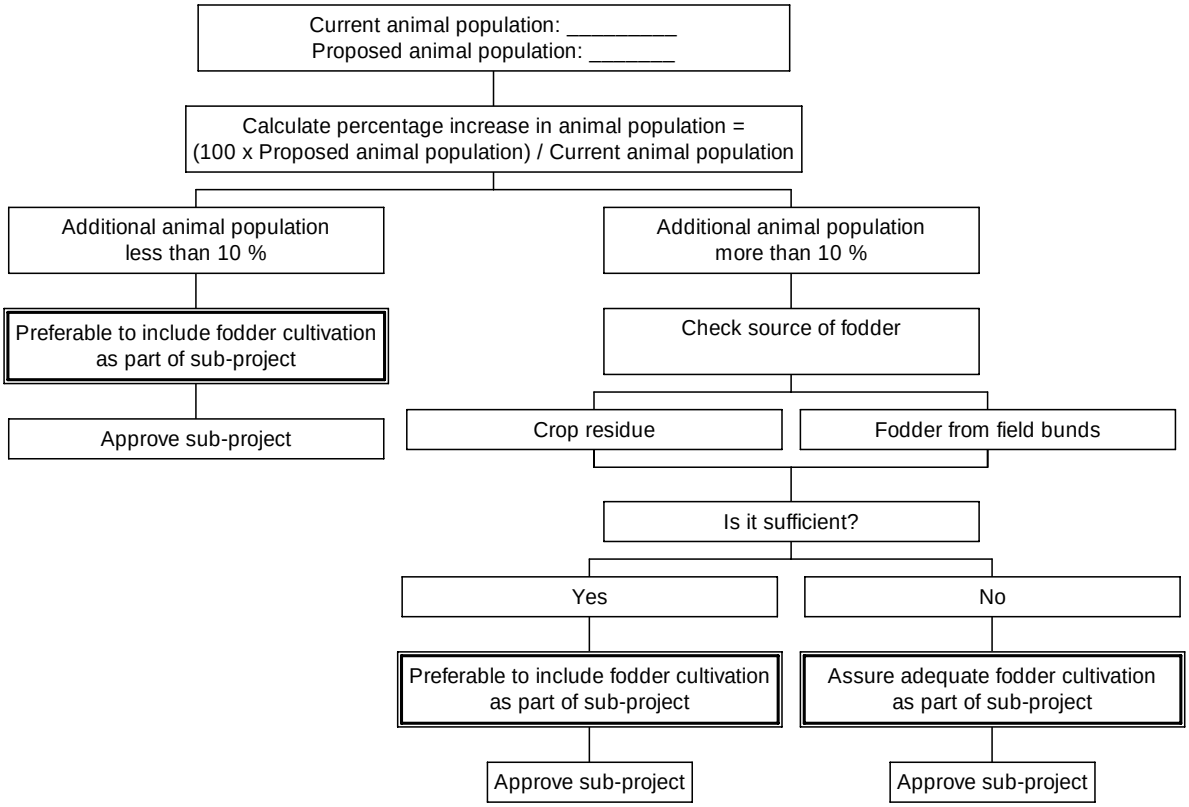
2. Resources to be impacted and Environment impact

Resources	**Potential Long term impact**
Grazing Land	Reduction in grass productivity and soil erosion
Forest Land	Reduced future tree population and regeneration

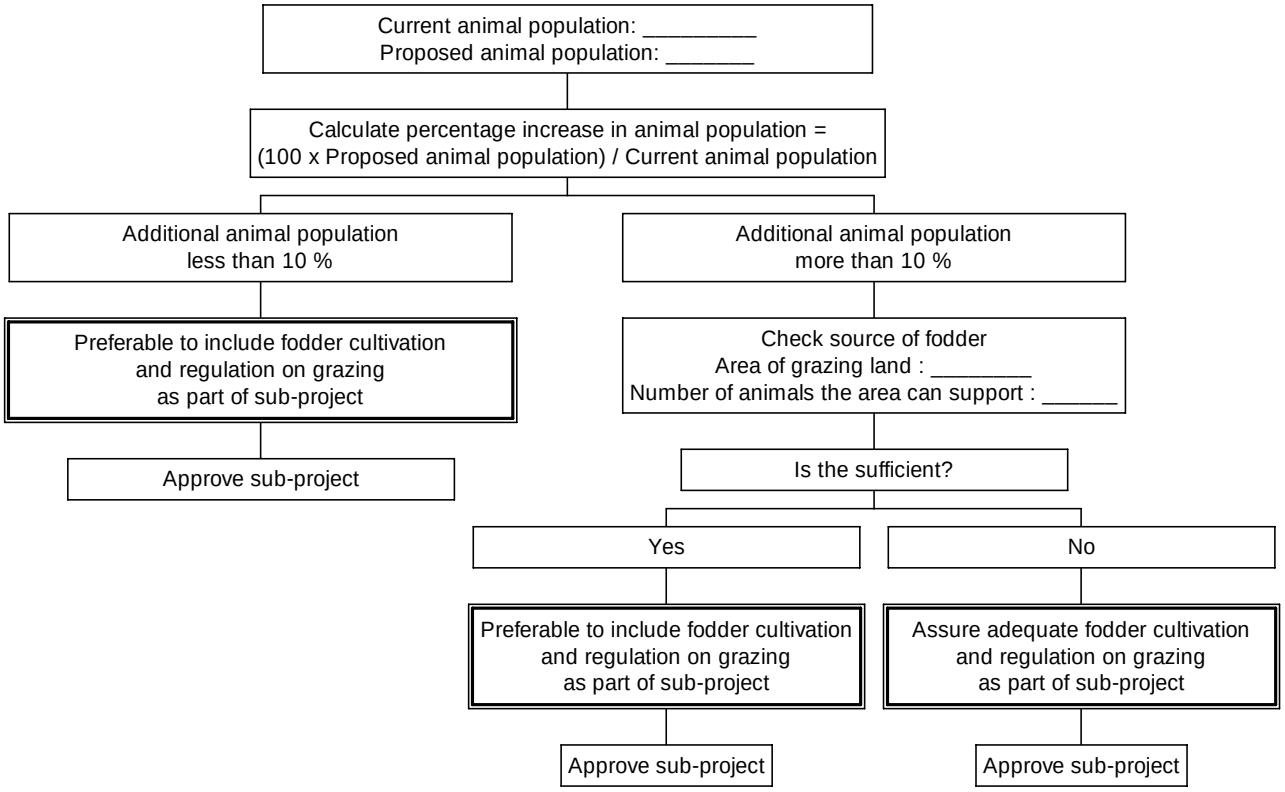
3. Potential Scenarios for Dairy project in Villages

Scenario – 1	No grassland or grazing land in the village	Chart – I
Scenario – 2	Grassland or grazing land available in the village	Chart – II
Scenario – 3	Forestland available in the village used for grazing	Chart - III

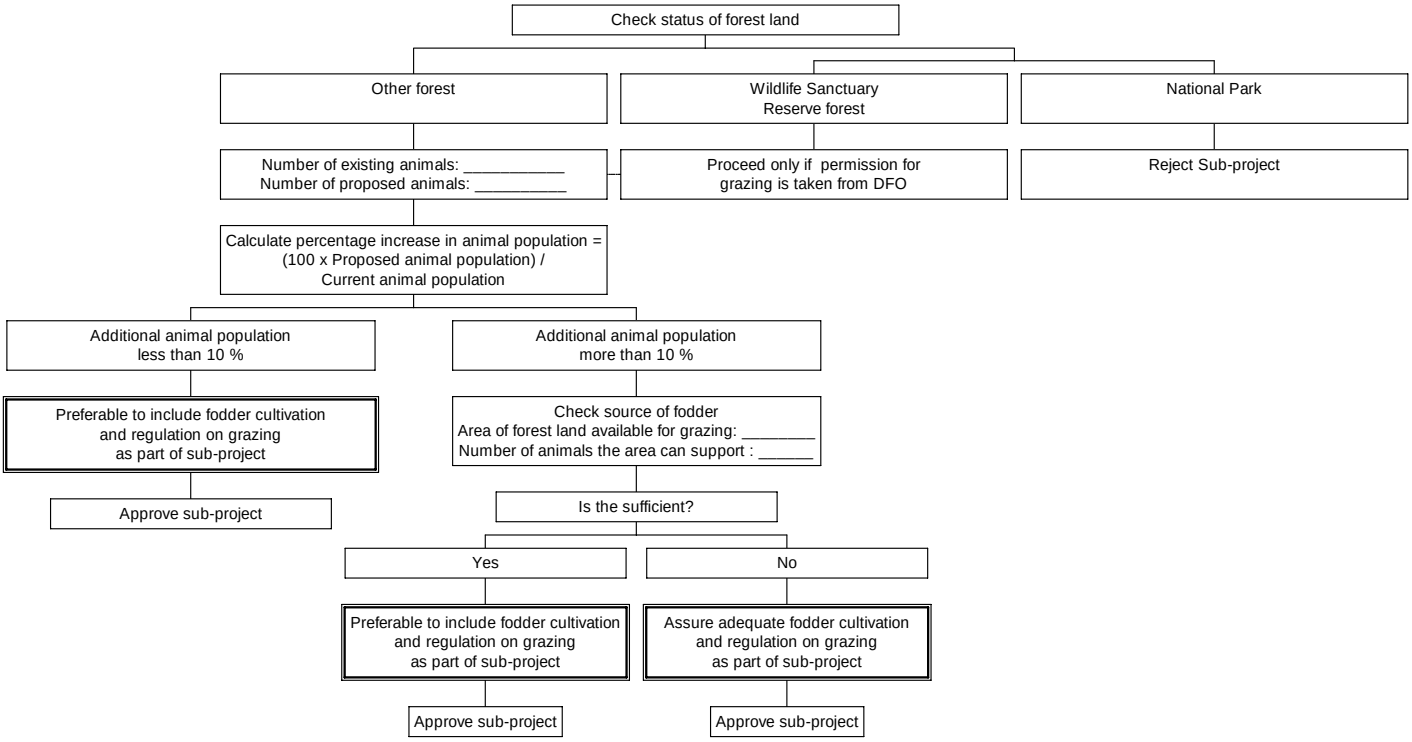
Scenario 1: No grazing land available
agriculture land (fallow fields, field bunds, crop residues) will be available for grazing



Scenario 2: Grazing land available



Scenario 3: Forestland is potential grazing land



EA Tool for NTFP Collection

(Applicable to seed, fruit, flower and leaf collection)

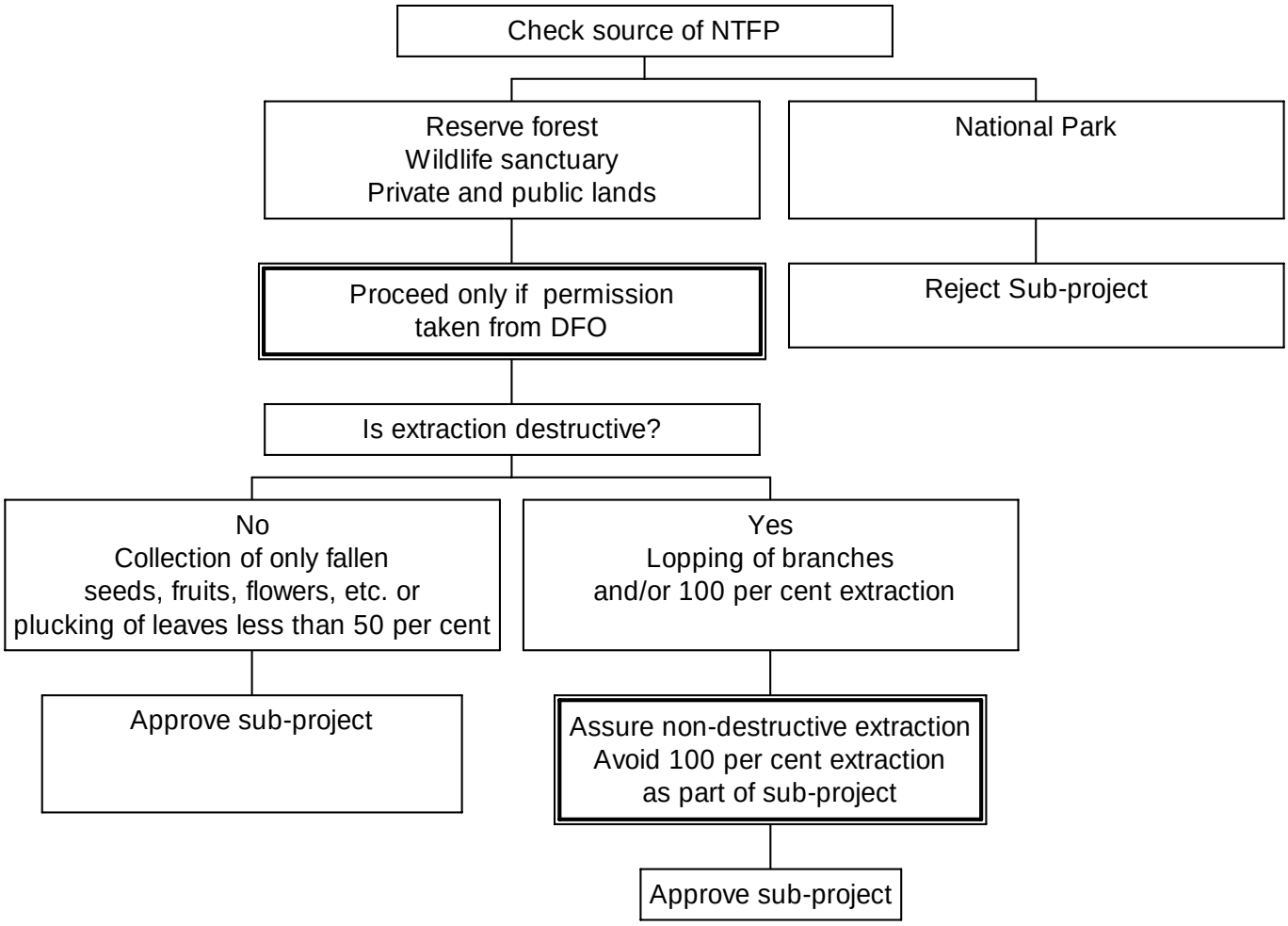
1. Level of assessment: Level I

2. Resources impacted

Resource	**Potential impacts**
Forest	Degradation of forests and loss of species, if not sustainably used
Trees in agricultural land	Degradation of trees and loss of species, if not sustainably used

3. Features of the proposed project – OPTIONAL

Number of families depending on NTFP collection –currently	.. No.s
Number of additional families proposed for NTFP collection	.. No.s
Total quantity of NTFP being collected for commercial purpose	.. kg or tons or bundles or bags
Status of Species proposed to be harvested	Abundant/rare/ threatened/endangered
Plant Part collected	Bark/leaf/root/leaf/fruits/others
Frequency / season of Collection	Yearly/half yearly/ monthly or month of harvest
Stage of collection	Young/ mature/ falling
Does collection method involves damage to trees	Yes/No
What is the kind of damage	Cutting branches/ overlopping/ damage to trunk
Current status of regeneration	Yes/No If yes trees < 2 m height ……. Nos trees 5 - 10 m height ……Nos trees > 10 m height …….. No.s
Current level of damage to NTFP trees	% trees damaged **(Very Important)**


Check source of NTFP
Reserve forest
Wildlife sanctuary
Private and public lands
National Park
Proceed only if permission taken from DFO
Reject Sub-project
Is extraction destructive?
No
Collection of only fallen seeds, fruits, flowers, etc. or plucking of leaves less than 50 per cent
Yes
Lopping of branches and/or 100 per cent extraction
Approve sub-project
Assure non-destructive extraction
Avoid 100 per cent extraction as part of sub-project
Approve sub-project

EA Tool for Construction of Shed for Animals

1. Level of assessment: Level I

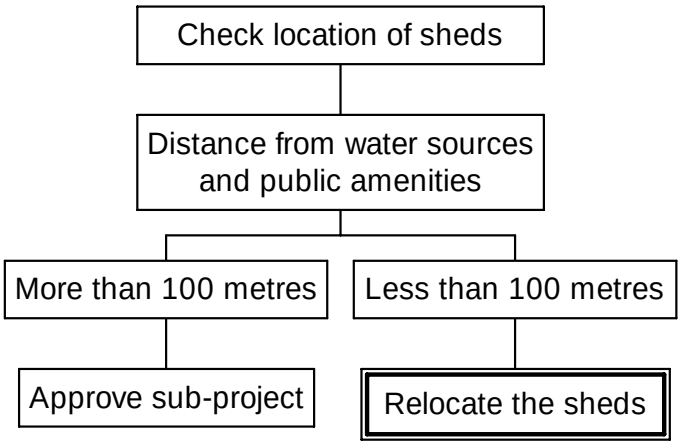
2. Resource impacted and environmental impact

Resource	**Potential impact – long-term**
Building materials like bricks, steel, cement, wood etc	Increases demand for building materials with a stress on energy/environment for producing such materials.

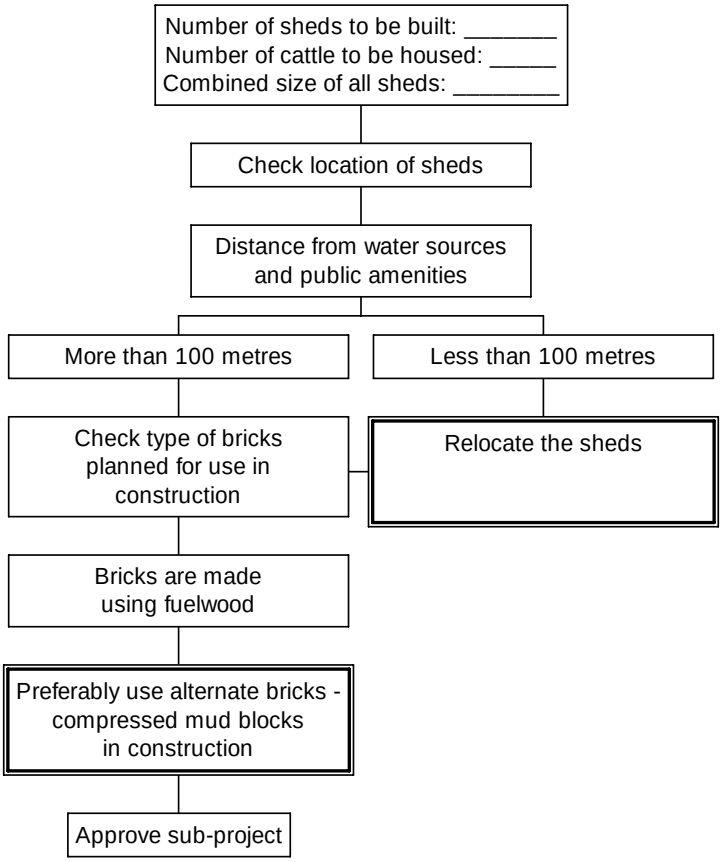
3. Potential scenarios

Scenario 1	If the shed number is < 10	Chart I
Scenario 2	If the shed number is > 10	Chart II

Scenario 1: Less than 10 sheds per village



Scenario 2: More than 10 sheds per village



ANNEXURE 1

CULTURAL PROPERTY PLAN

Background

1. The United Nations term "cultural property" includes sites having archeological (prehistoric), paleontological, historical, religious, and unique natural values. Cultural property, therefore, encompasses both remains left by previous human inhabitants (for example, middens, shrines, and battlegrounds) and unique natural environmental features such as canyons and waterfalls.

2. In the APRPRP, some sub-projects proposed for funding under the Community Investment Fund (CIF) component may be close to or in the vicinity of cultural properties. These are relevant in the context of the Bank's Operational Policy OP 4.11 Cultural Property. This Plan has been prepared to ensure that the provisions of the Bank's Operational Policy are met by the project.

3. As the APRPRP is going to adopt a community demand driven approach, the sub-projects that will be undertaken cannot be specified with certainty upfront.

4. The general policy regarding cultural properties is to assist in their preservation, and to seek to avoid their elimination.

Negative List

5. No sub-projects that will damage non-replicable cultural property will be permitted.

Sub-project Design and Implementation Principles

6. Sub-projects being implemented in areas known to have cultural properties will be studied to see whether they can cause any damage.

7. Sub-projects that are sited or designed so as to prevent damage to cultural properties will be assisted.

8. Sub-projects that protect and enhance cultural properties will be promoted.

9. If sub-projects involve the relocation and preservation of cultural property, then a Level II assessment will be required. If the preliminary investigations reveal a need for further investigation, a Level III assessment will be carried out.

10. The Level II and III assessments will necessarily involve public consultations and reference to scientific studies. Any training and institutional-building required for the preservation of the cultural property should form a part of the mitigation / enhancement measures to be implemented.

11. This plan has been incorporated in the EMF procedures and tools.

ANNEXURE 2

DAM SAFETY PLAN

Background

1. In the APRPRP, there are sub-projects proposed for funding under the Community Investment Fund (CIF) component. Some of these sub-projects are water retention structures / dams, which are relevant in the context of the Bank's Operational Policy OP 4.37 Safety of Dams. This Dam Safety Plan has been prepared to ensure that the provisions of the Bank's Operational Policy are met by the project.

2. As the APRPRP is going to adopt a community demand driven approach, the sub-projects that will be undertaken cannot be specified with certainty upfront. Drawing from the APDPIP implementation experience so far, the possible sub-projects are as follows:

    - Masonry Check Dams: These are for the purpose of diversion of irrigation water.
    - Rehabilitation, re-sectioning and unsilting of village tanks for irrigation and water supply.
    - Construction of earthen tank for minor irrigation (usually less than 100 acres)

Negative list

3. No sub-project involving a dam (existing or new) of 10m high or more will be permitted.

Sub-project Design & Construction Management Principles

4. For dam sub-projects below 10 m, the project follows a Design and Construction Manual for check dams (and other water retention structures), which includes the following:

- Design guidelines on determining the dam sizes, sizing of reservoir capacity and other salient design features.

- Design guidelines on how to provide for adequate spillways.

- Design guidelines for deciding the appropriate downstream slope.

- Construction guidelines for an earth filling procedure.

- Other generic dam safety measures.

5. The design of the dam sub-projects is generally done by a Consultant. On completion, the design will be necessarily checked and verified by qualified engineers.

Training

6. Whenever there are dam sub-projects, beneficiaries will be given training by qualified engineers. This training will focus on the maintenance of the dam sub-projects and will be organized by the concerned DPMU.

Monitoring

7. For each dam sub-projects, the DPMU will ensure that the Consultant who designed the dam revisits the sites during the initial filling of the reservoirs and suggests appropriate remedial measures in case any abnormal behaviour is observed.

8. Whenever there are dam sub-projects, a monitoring team comprising qualified engineers will be formed. This will be organized by the concerned DPMU. This team will monitor and evaluate the dam on a yearly basis. A dam safety report will be prepared by the team.

Records

9. All design and construction reports will be available in print and will be maintained as records for future reference. These will be retained during the project period in the respective DPMU and, subsequently, with an appropriate authority.

ANNEXURE 3

FORESTRY PLAN

Background

1. In the APRPRP, some sub-projects proposed for funding under the Community Investment Fund (CIF) component are in forest areas. These are relevant in the context of the Bank's Operational Policy OP 4.36 Forestry. This Plan has been prepared to ensure that the provisions of the Bank's Operational Policy are met by the project.

2. As the APRPRP is going to adopt a community demand driven approach, the sub-projects that will be undertaken cannot be specified with certainty upfront. Drawing from the APDPIP implementation experience so far, the possible sub-projects involving forestry are as follows:

- NTFP collection (collection of Mahua flowers, Mahua seeds, Lac, Neem fruit, Amla fruit, Adda leaves)
- Craft work involving forest produce (Bamboo basket making, Adda leaf plate making)

Negative List

3. No sub-projects involving logging operations or purchase of logging equipment will be supported.

4. In forest areas having high ecological value, only preservation, light and nonextractive use of forests will be permitted. Heavy extraction based sub-projects will not be permitted. Appendix 3.a gives a list of forest areas considered as having high ecological value.

Sub-project Design and Implementation Principles

5. Sub-projects involving plantation activities on forest land will only be supported on heavily degraded land and in non-forested areas including previously planted areas. These sub-projects will be necessarily prepared and implemented in consultation with and explicit approval of the Forest Department.

6. Income generation and infrastructure sub-projects within protected forest areas will be considered as requiring Level II assessment at the first instance. The list of protected forest areas is included in the Appendix to this plan.

7. If the Level II assessment reveals that the sub-project requires extraction of the forest resource and that the forest areas have high ecological value, then a Level III assessment will be initiated. The Level III assessment will include a social, economic and environmental assessment.

8. All sub-projects that involve interactions with forests will be developed with consultations with the local people and using environmentally sound forest conservation management principles.

9. In undertaking a Level II and III assessment, it will be ensured that the sub-project proponent has the capacity to implement mitigation measures. If such a capacity is found lacking, then the capacities will be built.

10. In sub-projects involving forestry, setting aside adequate compensatory preservation forests to protect and conserve biological diversity and environmental services and to safeguard the interests of forest dwellers, specifically their rights of access to and use of designated forest areas, will be considered.

11. This plan has been incorporated in the EMF procedures and tools.

APPENDIX 3.a: List of Forest Areas of High Ecological Value in the APRPRP Districts

(Defined as list of Protected Areas – Wildlife Sanctuaries and National Parks)

1. Sivaram Sanctuary, Adilabad and Karimnagar district
2. Eturnagaram Sanctuary, Warangal district
3. Pakhal Sanctuary, Warangal district
4. Kinersani Sanctuary, Khammam district
5. Papikonda Sanctuary, East and West Godavari district
6. Coringa Sanctuary, East Godavari district
7. Kolleru Sanctuary, West Godavari district.
8. Krishna Sanctuary, Krishna and Guntur district
9. Pocharam Sanctuary, Medak and Nizamabad districts
10. Manjira Sanctuary, Medak district
11. Nagarjunsagar-Srisailam Sanctuary, Guntur, Prakasham, Kurnool, Mahaboobnagar and Nalagonda
12. Rollapadu Sanctuary, Kurnool and Prakasham district
13. Gundla Brahmeshwaram Sanctuary, Kurnool and Prakasham district
14. Srilanka Malleshwaram Sanctuary, Cuddapah district
15. Nelapattu Sanctuary, Nellore district
16. Pulicat Sanctuary, Nellore district
17. Sri Venkateshwara Sanctuary, and National Park, Chittoor and Cuddapah districts

ANNEXURE 4

NATURAL HABITATS PLAN

Background

1. In the APRPRP, some sub-projects proposed for funding under the Community Investment Fund (CIF) component are likely within natural habitats such as wildlife sanctuaries, eco-sensitive wetlands, coastal zones and other eco-sensitive areas. These are relevant in the context of the Bank's Operational Policy OP 4.04 Natural Habitats. This Plan has been prepared to ensure that the provisions of the Bank's Operational Policy are met by the project.

2. As the APRPRP is going to adopt a community demand driven approach, the sub-projects that will be undertaken cannot be specified with certainty upfront.

Negative list

3. No sub-projects that involve the significant conversion or degradation of critical natural habitats will be supported. The list of critical natural habitats along with the basis for their classification has been included in the Appendix 4.a of this plan.

4. Based on the APDPIP experience, the list of sub-projects that will NOT be permitted within the critical natural habitats is as follows:

- Goat rearing in protected forests
- Brick making involving extraction from protected forests
- Agriculture involving chemical pesticide use without an IPM approach
- Intensive aquaculture involving harvest of fish/shrimp seed for the wild, pumping of saline water, conversion of prime agricultural land into aquaculture ponds, use of chemical inputs in natural wetlands and coastal habitats
- All infrastructure activities without permission from the Forest Department in protected forest areas and all activities that require permission from the Forest Department for which such permission has not been taken

Sub-project Design and Implementation Principles

5. Wherever feasible, sub-projects will be sited on lands already converted (excluding any lands that were converted in anticipation of the project).

6. Income generation and infrastructure development sub-projects within natural habitats will be considered as requiring Level II assessment at the first instance. The list of natural habitats is included in the Appendix to this plan.

7. In undertaking the Level II assessment, it will be clearly recognized that no sub-projects involving the significant conversion of natural habitats are permitted. In exceptional cases, where there are no feasible alternatives for the sub-project and its siting, then the sub-project will be referred to a Level III assessment.

8. In the Level III assessment, a comprehensive analysis will be undertaken to demonstrate that overall benefits from the project substantially outweigh the environmental costs. If the environmental assessment indicates that a project will significantly convert or degrade natural habitats, the project includes mitigation measures. Such mitigation measures include, as appropriate, minimizing habitat loss (e.g., strategic habitat retention and post-development restoration) and establishing and maintaining an ecologically similar protected area. Other forms of mitigation measures only when they are technically justified.

9. In undertaking either Level II or III assessment, the views, roles, and rights of groups, including local nongovernmental organizations and local communities affected by the sub-project involving natural habitats will be considered. The people shall be involved in planning, designing, implementing, monitoring, and evaluating such projects.

10. In deciding whether to support a sub-project with potential adverse impacts on a natural habitat, the project will take into account the sub-project proponent's ability to implement the appropriate conservation and mitigation measures. If there are potential institutional capacity problems, then the sub-project will not be approved.

11. This plan has been incorporated in the EMF procedures and tools.

APPENDIX 4.a: List of Critical Natural Habitats in the APRPRP Districts

(Defined as list of Protected Areas – Wildlife Sanctuaries and National Parks)

1. Sivaram Sanctuary, Adilabad and Karimnagar district
2. Eturnagaram Sanctuary, Warangal district
3. Pakhal Sanctuary, Warangal district
4. Kinersani Sanctuary, Khammam district
5. Papikonda Sanctuary, East and West Godavari district
6. Coringa Sanctuary, East Godavari district
7. Kolleru Sanctuary, West Godavari district.
8. Krishna Sanctuary, Krishna and Guntur district
9. Pocharam Sanctuary, Medak and Nizamabad districts
10. Manjira Sanctuary, Medak district
11. Nagarjunsagar-Srisailam Sanctuary, Guntur, Prakasham, Kurnool, Mahaboobnagar and Nalagonda
12. Rollapadu Sanctuary, Kurnool and Prakasham district
13. Gundla Brahmeshwaram Sanctuary, Kurnool and Prakasham district
14. Srilanka Malleshwaram Sanctuary, Cuddapah district
15. Nelapattu Sanctuary, Nellore district
16. Pulicat Sanctuary, Nellore district
17. Sri Venkateshwara Sanctuary, and National Park, Chittoor and Cuddapah districts

ANNEXURE 5

PEST MANAGEMENT PLAN

Background

1. In the APRPRP, considering the focus on rural poor, some sub-projects proposed for funding under the Community Investment Fund (CIF) component will have implications on pest management. These are relevant in the context of the Bank's Operational Policy OP 4.09 Pest Management. A separate Pest Management Plan has been prepared in this regard. This summary has been prepared to ensure that the provisions of the Bank's Operational Policy are met by the project.

2. As the APRPRP is going to adopt a community demand driven approach, the sub-projects that will be undertaken cannot be specified with certainty upfront. Drawing from the APDPIP implementation experience so far, the possible sub-projects that would involve pest management practices are as follows:

- Land development
- Vegetable cultivation
- Horticulture
- Floriculture
- Groundnut cultivation
- Paddy cultivation
- Cotton cultivation
- Training of agriculture extension workers

Negative list

3. Sub-projects that do not incorporate Integrated Pest Management (IPM) approaches will NOT be supported.

4. No sub-projects that intends to use banned pesticides will be approved. The list of banned pesticides is included in Appendix 5.a.

5. No sub-projects will be supported that require the use of agrochemicals in WHO Classes IA, IB and II. Appendix 5.b provides the list.

Sub-project Design and Implementation Principles

6. Sub-projects that use pesticides that are justified under an IPM approach will be permitted. All such sub-projects will necessarily adopt the guidelines for safe use. Appendix 5.c includes the Guidelines for the safe use of pesticides.

7. Pest populations are normally controlled through IPM approaches, such as biological control, cultural practices, and the development and use of crop varieties that are resistant or tolerant to the pest. Sub-projects that promote IPM approaches will be promoted. The IPM package must be designed in consultation with the local representatives of the Agriculture Department (Krishi Vignan Kendra, Agriculture Officer, etc).

8. With respect to the classification of pesticides and their specific formulations, the project refers to the World Health Organization's *Recommended Classification of Pesticides by Hazard and Guidelines to Classification* (Geneva: WHO 1994-95).

9. The following criteria apply to the selection and use of pesticides in this project:

- They must have negligible adverse human health effects.
- They must be shown to be effective against the target species.
- They must have minimal effect on nontarget species and the natural environment.
- The methods, timing, and frequency of pesticide application are aimed to minimize damage to natural enemies.
- Pesticides used must be demonstrated to be safe for inhabitants and domestic animals in the treated areas, as well as for personnel applying them.
- Their use must take into account the need to prevent the development of resistance in pests.

10. Training on pest management, pesticides and safe use form a part of the EMF. The Pest Management Plan is fully integrated with the EMF.

11. Any sub-project which involves use of chemical pesticides will include training on IPM and on safe pesticide use to the sub-project proponent.

APPENDIX 5.c: Guidelines on Safe Use of Pesticides

Farmers are not the only ones to be exposed to pesticides. The labourer, whether it is the person spraying or the person engaged in agriculture work in the field also faces threats of pesticide poisoning. The target group of the project is focussed toward a large number of the land less agriculture labour, especially women who are most often used in hazardous fieldwork. Hence protective measures such as gears and education becomes crucial to ensure that no negative health impacts. A listing of the factors to be borne in mind are listed under:

Field Application

- Avoid making cocktails of insecticides. If necessary, then each should be used in recommended dose.
- Use two-piece protective clothing, hand gloves, a cap, a full pant, a full-sleeved shirt and boots, and preferably a face shield.
- Spray during cooler hours of the day- morning and afternoon. Spray along the wind, not against it.
- Wash the spray equipment at the end of the day.
- Do not eat, drink, smoke, or chew tobacco during spraying.
- No not allow children, especially young girls to work in such fields.
- After handling or spraying pesticides wash hands, face, legs, with soap and water before eating, drinking, smoking or chewing tobacco.
- Seal cuts and wounds with medicated waterproof tape before spraying.
  Provide first aid in case of poisoning according to the instructions given in the label.

APPENDIX 5.a: List of Banned Pesticides Presently in Use in APRPRP Districts

1 Aldrin
2 Benzene Hexa Chloride (BHC)
3 Calcium Cyanide
4 Chlordane
5 Copper acetoarbenite
6 Dibromocworopropane (DBCP)
7 Endrin
8 Ethyl Mercury Chloride
9 Ethyl Parathion
10 Heptachlor
11 Manzona
12 Methomyl 24% Formulation
13 Nicotine Sulphate
14 Nitrofen
15 Paraquate dimethyl sulphate
16 Penta chloro nitrobenzene (PCNB)
17 Penta chlorophenol (PCP)
18 Phenyl Mercury Acetate (PMA)
19 Sodium Methane Arsonate(MSMA)
20 Tetradifon
21 Toxaphene
22 Phosohamidon 85% SL
23 Methomyl 12.5% L
24 Aldicarb
25 Chlorbenzilate
26 Dieldrin
27 Ethyl Dibromide (EDB)
28 Maleic Hydrazide
29 Trichloro Acetic Acid (TCA)
30 Aluminium Phosphamide
31 Carbofuran 505 WP
32 Captafal 80%
33 Malathian 25 DP & 50% EC
34 Methoxy ethyl mertcury chloride (MECE)

APPENDIX 5.b: Pesticide Classification List – WHO

Table 1. Extremely hazardous (Class Ia) technical grade active ingredients of pesticides (common name) – not permissible in the project

Aldicarb	Difethialone	Parathion-methyl
Brodifacoum	Diphacinone	Phenylmercury acetate
Bromadiolone	Disulfoton	Phorate
Bromethalin	Ethoprophos	Phosphamidon
Calcium cyanide	Flocoumafen	Sodium fluoroacetate
Captafol	Fonofos	Sulfotep
Chlorethoxyfos	Hexachlorobenzene	Tebupirimfos
Chlormephos	Mercuric chloride	Terbufos
Chlorophacinone	Mevinphos	
Difenacoum	Parathion	

Table 2. Highly hazardous (Class Ib) technical grade active ingredients of pesticides (Common name) – not permissible in the project

Acrolein	*Ethiofencarb*	Omethoate
Allyl alcohol	Famphur	Oxamyl
Azinphos-ethyl	*Fenamiphos*	Oxydemeton-methyl
Azinphos-methyl	Flucythrinate	Paris green [C]
Blasticidin-S	Fluoroacetamide	Pentachlorophenol
Butocarboxim	Formetanate	*Pindone*
Butoxycarboxim	Furathiocarb	Pirimiphos-ethyl
Cadusafos	Heptenophos	Propaphos
Calcium arsenate	Isazofos	Propetamphos
Carbofuran	Isofenphos	Sodium arsenite
Chlorfenvinphos	Isoxathion	Sodium cyanide
3-Chloro-1,2-propanediol	Lead arsenate	Strychnine
Coumaphos	Mecarbam	Tefluthrin
Coumatetralyl	Mercuric oxide	Thallium sulfate
Zeta-cypermethrin	Methamidophos	Thiofanox
Demeton-S-methyl	Methidathion	Thiometon
Dichlorvos	*Methiocarb*	Triazophos
Dicrotophos	Methomyl	Vamidothion
Dinoterb	Monocrotophos	Warfarin
Edifenphos	Nicotine	Zinc phosphide

Table 3. Moderately hazardous (Class II) technical grade active ingredients of pesticides (Common name) – not permissible in the project

Alanycarb
Anilofos
Azaconazole
Azocyclotin
Bendiocarb
Benfuracarb
Bensulide
Bifenthrin
Bilanafos
Bioallethrin
Bromoxynil
Bromuconazole
Bronopol
Butamifos
Butylamine
Carbaryl
Carbosulfan
Cartap
Chloralose
Chlordane
Chlorfenapyr
Chlorphonium chloride
Chlorpyrifos
Clomazone
Copper sulfate
Cuprous oxide
Cyanazine
Cyanophos
Cyfluthrin
Beta-cyfluthrin
Cyhalothrin
Cypermethrin
Alpha-cypermethrin
Cyphenothrin
Deltamethrin
Diazinon
Difenzoquat
Dimethoate
Dinobuton
Diquat
Endosulfan
Endothal-sodium
Esfenvalerate
Ethion
Etrimfos
Fenazaquin
Fenitrothion
Fenobucarb
Fenpropidin
Fenpropathrin
Fenthion
Fentin acetate
Fentin hydroxide
Fenvalerate
Fipronil
Fluxofenim
Formothion
Fuberidazole
Gamma-HCH
Guazatine
Haloxyfop
Heptachlor
Imazalil
Imidacloprid
Iminoctadine
Ioxynil
Ioxynil octanoate
Isoprocarb
Lambda-cyhalothrin
Mercurous chloride
Metaldehyde
Metam-sodium
Methacrifos
Methasulfocarb
Methyl isothiocyanate
Metolcarb
Metribuzin
Molinate
Nabam
Naled
Paraquat
Pebulate
Permethrin
Phenthoate
Phosalone
Phosmet
Phoxim
Piperophos
Pirimicarb
Prallethrin
Profenofos
Propiconazole
Propoxur
Prosulfocarb
Prothiofos
Pyraclofos
Pyrazophos
Pyrethrins
Pyroquilon
Quinalphos
Quizalofop-p-tefuryl
Rotenone
Sodium fluoride
Sodium hexafluorosilicate
Spiroxamine
Sulprofos
Terbumeton
Tetraconazole
Thiacloprid
Thiobencarb
Thiocyclam
Thiodicarb
Triazamate
Trichlorfon
Tricyclazole
Tridemorph
Vernolate
Xylylcarb

Table 4. Slightly hazardous (Class III) technical grade ingredients of pesticides (Common name) – permissible under IPM

Acephate
Acetochlor
Acifluorfen
Alachlor
Allethrin
Ametryn
Amitraz
Azamethiphos
Bensultap
Bentazone
Bromofenoxim
Butroxydim
Chinomethionat
Chlormequat (chloride)
Chloroacetic acid
Chlorthiamid
Copper hydroxide
Copper oxychloride
Cycloate
Cyhexatin
Cymoxanil
Cyproconazole
Dazomet
Desmetryn
Dicamba
Dichlormid
Dichlorobenzene
Dichlorophen
Dichlorprop
Diclofop
Dienochlor
Diethyltoluamide
Difenoconazole
Dimepiperate
Dimethachlor
Dimethametryn
Dimethipin
Dimethylarsinic acid
Diniconazole
Dinocap
Diphenamid
Dithianon
Dodine
Empenthrin
Esprocarb
Etridiazole
Fenothiocarb
Ferimzone
Fluazifop-p-butyl
Fluchloralin
Flufenacet
Fluoroglycofen
Flurprimidol
Flusilazole
Flutriafol
Fomesafen
Furalaxyl
Glufosinate
Hexazinone
Hydramethylnon
Iprobenfos
Isoprothiolane
Isoproturon
Isouron
Malathion
MCPA-thioethyl
Mecoprop
Mecoprop-P
Mefluidide
Mepiquat
Metalaxyl
Metamitron
Metconazole
Methylarsonic acid
Metolachlor
Myclobutanil
2-Napthyloxyacetic acid
Nitrapyrin
Nuarimol
Octhilinone
N-octylbicycloheptene dicarboximide
Oxadixyl
Paclobutrazol
Pendimethalin
Pimaricin
Pirimiphos-methyl
Prochloraz
Propachlor
Propanil
Propargite
Pyrazoxyfen
Pyridaben
Pyridaphenthion
Pyridate
Pyrifenox
Quinoclamine
Quizalofop
Resmethrin
Sethoxydim
Simetryn
Sodium chlorate
Sulfluramid
Tebuconazole
Tebufenpyrad
Tebuthiuron
Thiram
Tralkoxydim
Triadimefon
Triadimenol
Tri-allate
Triclopyr
Triflumizole
Undecan-2-one
Uniconazole
Ziram

Table 5. Technical grade active ingredients of pesticides unlikely to present acute hazard in normal use (Common name) – permissible

Aclonifen
Acrinathrin
Alloxydim
Amitrole
Ammonium sulfamate
Ancymidol
Anthraquinone
Asulam
Atrazine
Azimsulfuron
Azoxystrobine
Benalaxyl
Benazolin
Benfluralin
Benfuresate
Benomyl
Benoxacor
Bensulfuron-methyl
Bifenox
Bioresmethrin
Biphenyl
Bispyribac
Bitertanol
Borax
Bromacil
Bromobutide
Bromopropylate
Bupirimate
Buprofezin
Butachlor
Butralin
Butylate
Captan
Carbendazim
Carbetamide
Carboxin
Carpropamid
Chlomethoxyfen
Chloramben
Chloransulam methyl
Chlorbromuron
Chlorfluazuron
Chloridazon
Chlorimuron
Chlorothalonil
Chlorotoluron
Chlorpropham
Chlorpyrifos methyl
Chlorsulfuron
Chlorthal-dimethyl
Chlozolinate
Cinmethylin
Cinosulfuron
Clofentezine
Clomeprop
Clopyralid
Cloxyfonac
Cryolite [C]
Cycloprothrin
Cyclosulfamuron
Cycloxydim
Cyhalofop
Cyromazine
Daimuron
Dalapon
Daminozide
Desmedipham
Diafenthiuron
Dichlobenil
Dichlofluanid
Diclomezine
Dicloran
Diclosulam
Diethofencarb
Diflubenzuron
Diflufenican
Dikegulac
Dimefuron
Dimethirimol
Dimethomorph
Dimethyl phthalate
Dinitramine
Dipropyl isocinchomerate
Dithiopyr
Diuron
Dodemorph
Ethalfluralin
Ethephon
Ethirimol
Ethofumesate
Etofenprox
Famoxadone
Fenarimol
Fenbutatin oxide
Fenchlorazole
Fenclorim
Fenfuram
Fenhexamid
Fenoxycarb
Fenpiclonil
Fenpropimorph
Fenuron
Fenuron-TCA
Ferbam
Flamprop
Flucarbazone-sodium
Flucycloxuron
Flufenoxuron
Flumetralin
Flumetsulam
Fluometuron
Flupropanate
Flupyrsulfuron
Flurenol
Fluridone
Flurochloridone
Fluroxypyr
Fluthiacet
Flutolanil
tau-Fluvalinate
Folpet
Fosamine
Fosetyl
Gibberellic acid
Glyphosate
Hexaconazole
Hexaflumuron
Hexythiazox
Hydroprene
Hymexazol
Imazamethabenzmethyl
Imazapyr
Imazaquin
Imazethapyr

Imibenconazole
Inabenfide
Iprodione
Iprovalicarb
Isoxaben
Kasugamycin
Lenacil
Linuron
Maleic hydrazide
Mancozeb
Maneb
Mefenacet
Mepanipyrim
Mepronil
Metazachlor
Methabenzthiazuron
Methoprene
Methoxychlor
Methyldymron
Metiram
Metobromuron
Metosulam
Metoxuron
Metsulfuron methyl
Monolinuron
2-(1-Naphthyl) acetamide
1-Naphthylacetic acid
Napropamide
Naptalam
Neburon
Niclosamide
Nicosulfuron
Nitrothal-isopropyl
Norflurazon
Ofurace
Oryzalin
Oxabetrinil
Oxadiazon
Oxine-copper
Oxycarboxin
Oxyfluorfen
Penconazole
Pencycuron
Pentanochlor
Phenmedipham
Phenothrin
Phenylphenol
Phosphorus acid
Phthalide
Picloram
Piperonyl butoxide
Pretilachlor
Primisulfuron
Probenazole
Procymidone
Prodiamine
Prometon
Prometryn
Propamocarb
Propaquizafop
Propazine
Propham
Propineb
Propyzamide
Pyrazolynate
Pyrazosulfuron
Pyrimethanil
Pyriminobac
Pyriproxyfen
Pyrithiobac sodium
Quinclorac
Quinmerac
Quinoxyfen
Quintozene
Rimsulfuron
Siduron
Simazine
Spinosad
Sulfometuron
Sulphur
Tebutam
Tecnazene
Teflubenzuron
Temephos
Terbacil
Terbuthylazine
Terbutryn
Tetrachlorvinphos
Tetradifon
Tetramethrin
Thiabendazole
Thidiazuron
Thifensulfuron-methyl
Thiophanate-methyl
Tiocarbazil
Tolclofos-methyl
Tolylfluanid
Transfluthrin
Triasulfuron
Tribenuron
Trietazine
Triflumuron
Trifluralin
Triflusulfuron-methyl
Triforine
Triticonazole
Validamycin
Vinclozolin
Zine