E4644

ENVIRONMENT MANAGEMENT FRAMEWORK

for

Andhra Pradesh Rural Inclusive Growth Project (APRIGP)

By Society for Elimination of Rural Poverty (SERP)

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Executive Summary

Introduction:

The Andhra Pradesh Rural Inclusive Growth Project (APRIGP), supported by financial assistance from the World Bank, aims at supporting the Government of AP's goal of making the State poverty free by 2017 through a strategy of including the poor in the benefits of economic growth and human development outcomes. The project is also aligned with the Government of India's XII Five Year Plan for a 'faster, sustainable and more inclusive growth' and growth target of 8.2 percent.

The objective of the project is 'to enable selected poor households to diversify and enhance sources of income and secure increased access to human development services and social entitlements'.

This would be achieved by supporting GoAP in scaling up the rural poverty reduction initiatives and the existing institutional platforms of the rural poor with an emphasis on inclusive economic growth and access to human development and social development services. The project will integrate the small and marginal producers to urban markets by making them competitive through value addition and creating jobs for the youth in semi-urban and urban locations. Improving access to services such as education, nutrition, etc. and increased coverage of social safety net and social risk management programs help poor to share benefits of economic growth.

The programs will be implemented in selected geographies (about one third of the state) based on social stratification, value chain potential, and inclusion deficit in HD indicators and access to services and entitlements. Lessons from this project will be concurrently taken to other Mandals in the State which have better outcomes in terms of HD indicators and enhanced income for small producers.

The project has the 5 following components and sub components:

1. Value chain enhancement through producer organizations.
    a. Rural value Chains
    b. Rural retails Chains
2. Human Development
    a. Strengthening the supply of key nutrition, health and pre-school education services
    b. Strengthening the demand for quality nutrition, health, sanitation and pre-school education services
    c. Establishing linkages with value chains
3. Access to entitlements
    a. Improved delivery of service and entitlements
    b. Improved access to productive safety nets
    c. Improved access to vulnerability services
4. TA, ICT & Partnerships
    a. Information and Communication Technologies (ICT)
    b. Partnerships
    c. Technical Assistance to line departments
    d. Centre of Excellence and Knowledge Management
5. Project Implementation Support

Environment Assessment Study:

The Society for elimination of Rural Poverty (SERP) has undertaken an Environmental Assessment (EA) of the project to ensure that the planned activities are environmentally sustainable. The study was conducted with an objective of understanding environmental implications of project activities, and to define remedial measures to mitigate any negative impacts, in line with the national and state legal and regulatory framework and the World Bank Operational Policies.

The environment assessment study identified the following key potential environmental issues related to the project interventions

- Possible over exploitation of resources such as ground water for irrigation
- Introducing high yielding varieties which need intensive irrigation and which could result in loss of indigenous varieties
- Increased fertilization that can have negative impact on soil and water
- Setting up mills, processing units and storage structure which need high energy requirement and may release toxic wastes to the environment
- Use of chemicals, waste disposal and energy use in micro enterprises and possibility of health hazards.
- Possibility of contamination of the surrounding environment due to drinking water and sanitation interventions when environment guidelines are not followed

Environment Management Framework:

The objective of Environmental Management Framework EMF is to Ensure Environmental Sustainability of Value chain and Human Development interventions proposed under APRIGP and to contribute to economic enhancement by accessing premiums through Climate friendly practices in value chains and KRuSHE enterprises. The EMF provides a strategy to manage negative environmental impacts of the value chain and human development activities there by sustaining the benefits of these interventions. It also provides the institutional mechanism to operationalise the EMF which contains guidelines, systems and procedures for ensuring environmental sustainability during project implementation. The project triggers the following Operational Safeguard policies of the World Bank: Environmental Assessment (OP 4.01); Forests (OP 4.36) ; Natural habitats (OP 4.04) and Pest Management (OP4.09) . The necessary measures to ensure compliance with these laws, regulations, and policies are included in the negative list and environmental guidelines are developed as part of the EMF.

The EMF is applicable to the following components of RIGP. The negative impacts need to be addressed or can be avoided by opting for an environment friendly alternative available

Components	**Applicability of EMF**
Component 1 – Value chain enhancement through producer organizations.	The value chain enhancement has several steps like productivity enhancement, processing, manufacture, storage etc. EMF is applicable at every stage of value chain.

Component 2- Human	Environmental guidelines for interventions in water and sanitation, nutrition etc.
Component 4 – ICT and Partnerships	Guidelines for E waste management. 'Innovation forum' under Partnership component for 'Green Business Opportunities'

EMF identifies the possible environmental implications of each interventions proposed under each component and sub component and suggests environment friendly alternatives or mitigation measures for each. It includes 'environment guidelines' or 'environment friendly alternatives' for all the components. It also encourages Green Business Opportunities on the critical environmental issues indentified in the proposed activities through 'innovation forums' 'solution market places' and 'knowledge events' under partnership component.

The EMF implementation strategy is to integrate activity specific environment guidelines (greening of the plans) into the business plans and business proposals (rural chains and retail chains) and Human Development plans right at the inception stage. The system of Environment Appraisal will ensures compliance with applicable laws and regulations of the GoI and the triggered safeguard policies of the World Bank and integration of environment guidelines. The EMF also provides strategy for promoting Green Business Opportunities through innovation forum and strategy to enhance economic benefits by green audits and third party certification of value chain products.

The EMF was prepared in close consultations with key stakeholders on relevant components and EMF implications through discussions at SERP and workshops in select locations – Visakhapatnam and Kurnool.

The key implementation arrangements include

- Institutional arrangements: the institutional arrangements are the key for effective implementation of EMF at cluster, district and state levels. The roles and responsibilities of key staff at different levels are provided. However the staffing costs are not included in budget as it would be included as part of Project management costs.
- Monitoring strategy: The focus of monitoring is to ensure the implementation of EMF and also to help in accessing the premiums by green ratings and certification. Internal and external audit mechanisms are planned for the same which are detailed in the EMF.
- Capacity Building Plan: Capacity building plan for staff at various levels with the suggested curriculum and mode of delivery is designed in order to strengthen the capacities of the staff and community at different levels.
- Implementation time line: The implementation timeline is provided with tasks spread across 5 years with 6 monthly intervals.
- Budget: The estimated budget (tentative) for implementation Rs. 4, 74, 80,000 (rupees four crore seventy four lakh eighty thousand only).

Chapter I

1. Andhra Pradesh Rural Inclusive Growth Project (APRIGP)

1.2. Background of the project:

Government of Andhra Pradesh (GoAP) Proposes Andhra Pradesh Rural Inclusive Growth Project (APRIGP) which aims at supporting the GoAP's goal of making the State poverty free by 2017 through a strategy of including the poor in the benefits of economic growth and human development outcomes. The project is also aligned with approach for XII Five Year Plan for a 'faster, sustainable and more inclusive growth' and growth target of 8.2 percent. The overall strategy is to look beyond growth and focus on generation of employment to the millions of the youth in the State. This would eventually result in a faster reduction in unemployment and poverty through skill development and also help bridging multiple divides. The project is consistent with proposed CPS (FY2013-2017) contributing to two main engagement areas viz. spatial transformation, and social inclusion. The project will integrate the small and marginal producers to urban markets by making them competitive through value addition and creating jobs for the youth in semi-urban and urban locations. Improving access to services such as education, nutrition, etc. and increased coverage of social safety net and social risk management programs help poor to share benefits of economic growth. Finally, the project also supports the Government of India's "Finance Plus" approach by investing in building community institutions that can foster higher order impacts. Firstly, it will aim to bring various schemes together on to one synergistic platform (gender, nutrition health and livelihoods leveraging major govt. scheme such as ICDS and NRHM). Secondly, it will invest in ICT and social accountability mechanisms for improving service delivery in a sustainable manner. Finally, innovations such as, alternate service delivery models, Public-Private-Community-Partnerships (PPCP) will be the key drivers of this project.

1.2. Project Development Objective:

The objective of Andhra Pradesh Rural Inclusive Growth Project (APRIG) is 'to enable selected poor households to diversify and enhance sources of income and secure increased access to human development services and social entitlements'.

This would be achieved by supporting Government of Andhra Pradesh in scaling up the rural poverty reduction initiatives and the existing institutional platforms of the rural poor under previous IDA supported APDPIP and APRPRP with an emphasis on inclusive economic growth and access to human development and social development services. These programs will be implemented in selected geographies (about one third of the state) based on social stratification, value chain potential, and inclusion deficit in HD indicators and access to services and entitlements. Lessons from this project will be concurrently taken to other Mandals in the State which have better outcomes in terms of HD indicators and enhanced income for small producers.

1.3. Project Components:

The project has the 5 following components.

1.3.1. Component 1: Value Chain Enhancement through Producer Organizations (US$ 30 million):

The objective of this component is to increase income of 2,50,000 small and marginal farmers by at least 50% through livelihood diversification, productivity enhancement and improved market access. This component will work with those small and marginal producers who have built up productive assets and have previously participated in productivity improvement, cropping technology and market access programs in select livelihoods/sectors. The project now proposes to work with these producers and help them move up the value chain and appropriate the growth opportunities. This will be achieved by organizing them into economic organizations (producer groups/organizations/companies); ensuring high service quality of support services like technology, credit, extension, marketing, etc.; and sustainable access to markets. Strengthening the market links, the project will facilitate value chain partnerships with leading market players and also support in creating local markets by connecting rural producers with shandis, rural haats, kirana shops, etc. In other words, the project will create ecosystem for inclusive growth of small and marginal producers.

The above approach will be adopted in key pro-poor sub-sectors/ commodities viz. Paddy, Red Gram, Turmeric, Cashew, Coffee, Pine apple, Milk, Fish, Poultry and Small ruminants which have high potential to scale up and impact large number of poor households. The value chain development strategies center around the following two approaches (i) resource based approach or producer driven value chains based on pre-dominant activity in the area and building upon comparative advantage of poor producers around production systems, organic value chains, agri-nutrition linkages, etc.), and (ii) market induced approach or buyer driven value chains (for e.g. turmeric, coffee, cashew, milk, etc.) for taking advantage of the emerging market opportunities in local and urban markets. Here the project will provide end-to-end solutions for helping poor access commodity and product markets. The project will systematically develop retail chains for connecting producers with consumers and trapping and appropriating value creation in local area. The component will have two sub-components viz. Rural Value Chains and Rural Retails Chains/Social Enterprises.

Rural Value Chains: As part of this sub component, the key activities to be undertaken would include; production planning along the production cycle; cost reduction through inputs aggregation; productivity enhancement through seed replacement and dissemination of improved package of practices through community managed extension; quality improvement of the produce through grading, sorting and packaging; creating local value addition infrastructure; higher unit value realization through aggregation and collective marketing to extract full value of the value chain intervention. The key investments to be supported under the sub-component include (i) Building and strengthening economic organizations of the small and marginal producers (ii) Establishing Community based Productivity Enhancement Systems (ii) Supply of planting material, seed and breed development services (iv) Creation of small scale productive infrastructure for improving labor productivity local value addition (v) Building financial sector linkages for producer organizations: and (vi) Technical assistance for organizing producer organizations, value chain relationships and building viable business model.

Rural Retail Chains: The objective of this sub-component is twofold. Firstly, it will systematically develop localized value chains that connect rural producers/producer groups and home-based enterprises with the rural poor consumers. This will include transforming the product mix and business models of nearly traditional rural retail *(kirana)* stores (existing traders belonging to SCs and STs and new small entrepreneurs) into social enterprises providing a range of products related to nutrition, hygiene and alternate energy and linking them with large social

enterprises. These traditional stores and enterprises will be organized into a network of rural retail marts (Knitting Rural Self Help Enterprises (KRuSHE) Marts) and home-based enterprises (KRuSHE Enterprises). Secondly by transforming the *kirana* stores to provide counseling services and offer good quality, affordable, safe and socially relevant goods (with emphasis on nutritionally significant items, marketing affordable quality sanitary products, personal hygiene products, etc.) and other essential goods to the poorest households, the project will enhance and improve the quality of consumption of the poor households. Therefore, the success of this sub-component is intricately linked to the human development impacts that the livelihoods investments will generate. The key investments to be supported under the rural retail chain sub component include (i) Establishing a rural retail chain by transforming traditional kirana stores and building brand KRuSHE that will be positioned as convenient and affordable access points for good quality, safe and standard products; (ii) Promoting clusters of home based KRuSHE Enterprises with particular emphasis on processing and value addition of agriculture produce and manufacturing of nutrition products; (iii) Capacitation (entrepreneurship and retail management training) and business development services to KRuSHE Marts and KRuSHE Enterprises; (iv) Building association of KRuSHE Marts that are homogeneous in size and financial stature; (v) Investments in technology platforms like an e-commerce portal for KRuSHE products and IVRS and SMS based technologies to source, aggregate and execute orders.

1.3.2. Component 2 - Human Development (US$ 15 million):

Poor knowledge and demand for quality services coupled with low levels of skill and motivation amongst the service providers are some of the key reasons for huge gaps in service utilization, quality and trust between the community and public health and nutrition service delivery systems. Recognizing these gaps, the project seeks to build on the existing social capital that exists in SERP, in the form of a federation of women's groups from the village to the state level, and capacitate them to demand and access services, while also investing in strengthening the capacity of systems to deliver. Therefore, the focus of project interventions is to enable the demand side to hold the supply side accountable for service delivery in the Human Development (HD) sector, as well as to improve HD service delivery by strengthening the existing public systems to deliver quality services. Appropriate links will also be established between the HD and Value Chain components ensuring a multi-sectoral approach to addressing early childhood development outcomes. Specific interventions to operationalize this approach include:

Sub-component 2.1: Strengthening the supply of key nutrition, health and pre-school education services by introducing and improving mechanisms for community engagement, community monitoring and ICT based monitoring systems. This will entail (a) supporting the establishment of community monitoring under the existing convergence framework of *Maarpu* introduced by the government of AP (b) strengthening the training architecture under the departments of women and child development and health and family welfare, specifically on the issue of community mobilization, early childhood education and growth monitoring and promotion (c) supporting the development and roll out of an integrated/convergent management information system that incorporates key indicators associated with mother and child (including indicators of health, nutrition and education) to enable better tracking of these vulnerable groups jointly by the departments of health, women and child development and rural development; and (d) flexible funds for specific technical assistance that may be required by the line departments during the course of implementation to improve HD interventions.

Sub-component 2.2: Strengthening the demand for quality nutrition, health, sanitation and pre-school education services by undertaking specific mobilization at the village level around HD outcomes including nutrition, sanitation, health and pre-school education. This would include creating awareness about the relevance of health, nutrition and education seeking behaviors and empowering communities to access, demand and facilitate delivery of quality services to achieve HD outcomes. Specific activities will include (a) Building capacities of Village Level Coordination Committees that include gram panchayat representatives, constituted under *Maarpu*, to develop village HD plans, implement activities proposed under the plan, monitor progress along these plans and review outcomes (b) communication for behavior and social change and (c) community monitoring for demand generation using tools such as community score cards (d) demand side activities for promotion of water, sanitation and hygiene improvements.

Water, Sanitation and Hygiene (WASH) improvements have been shown consistently to result in better health, as measured by reduced incidence of diarrhea, reduction in parasitic infections, increased child growth, and reduced morbidity and mortality. Similarly, increasing the quantity of water allows for better hygiene i.e. hand washing, food washing, and household cleaning. Improving the quality of water reduces the ingestion of pathogens. Experiences with hygiene education indicate that the potential signs of health impacts due to behavior change programs take time to materialize, because it is not only the potential users of facilities who need to change their behavior; behavioral changes are also needed at all levels - household, neighborhood and the entire community. The project will therefore use community led approaches to improve access to WASH services in about 1000 targeted villages adopting saturation approach to cover all households and rural institutions like schools, anganwadi centers, health centers, etc. and helping them achieve Open Defecation Free (ODF) status. The approach would include strengthening linkages between Village Organizations with Gram Panchayats and Village Water and Sanitation Committees to effectively plan, organize, implement and manage community led WASH services for the poorest households. Participatory learning tools and diagnostic instruments will be developed and IEC material The Village Human Development Plans (VHDPs) will also have strong focus on WASH activities. These will include triggering actions and participatory planning exercises for VHDP. Construction and rehabilitation of institutional water and sanitation facilities in schools and health facilities will also be undertaken which will serve as demonstration sites. Promotion of improved hygiene and sanitation practices through support in the design and application of behavior change communication (BCC) materials in beneficiary communities a cadre of volunteers and resource persons.

Sub-component 2.3: Establishing linkages with value chains by supporting livelihood activities aimed at improving community access to nutrient rich and dietary diverse foods. This will include (a) making nutrient rich snacks available through nutri-shops (refer Component 1) in the project mandals and creating awareness among the community on the benefits of these products; (b) counseling and encouraging farmers, through Farmer Field Schools (FFS) (Refer Component 1) to grow and consume diversified food crops during the season and following up with women members through Nutrition Field Schools (NFS); (c) establishing family and food centers (a take away food center) to promote nutritional security among households with female wage seekers who may not have the time to prepare and access nutritious food; and (d) establishment of

community kitchens on a pilot basis to supply nutritious meals to ICDS centers, schools (under the mid-day meal scheme), destitute feeding centers, etc.
While activities under sub-components 2.1 and 2.3 will be rolled out across all project mandals, the demand side activities proposed under sub-component 2.2 will initially be piloted in 50 project mandals. A rigorous impact evaluation will be designed to allow for an assessment of the demand driven aspects proposed under this sub-component. The evaluation will include process monitoring as an integral part of its design to allow for required mid-course corrections. Furthermore, a mid-line evaluation by the end of year 2 of implementation will also be planned to enable lessons learned to be shared with the government and other relevant stakeholders, in order to facilitate scale up of the model in the remaining 100 mandals through the government's own funds.

1.3.3. Component 3 - Access to entitlements (US$ 7.5 million):

This component aims to improve the coverage and service delivery of social protection entitlements to 1 million of poorest households mainly belonging to the SC/STs and particularly those with PWDs, and ensures that they are protected from risks and vulnerabilities through an integrated mission mode approach, while addressing the last mile issues. The component will consist of 3 main sub components.
Subcomponent 1: Improved delivery of service and entitlements**:** This sub-component will support the establishment of one stop shop service points by the Village Organizations to improve the outreach and quality of access for select services and entitlements by the SC/ST and poorest of the poor communities. The support activities for achieving this include (i) Establishing One Stop Shop (OSS)/Single Window/Kiosk at the village level which offers broad range of services viz. undertaking information, education and communication (IEC) activities, providing counseling services and facilitating enrolment of left out poor in identified schemes. (ii) Setting up of a convergent Information Technology platform and developing an application suite for various services offered by the OSS (iii) Establishing a Direct Benefit Transfer Cell for coordinating multiple stakeholders at different levels including government departments, commercial banks, post offices, banking correspondent companies, technology service providers, and last mile agents. This cell at the State level will have a pool of experts that would lead on integration of beneficiary databases across departments, negotiate with banks and BC companies, coordinate with line agencies on payment delays, ensure real time monitoring and identification of hot spots and set service standards for the range of stakeholders (iv) Setting up a dedicated Call Center for accountability and grievance handling for the services offered by OSS through effective coordination between various Government departments involved in the project (v) Systematic capacity building and training of community institutions, community professionals, project staff, Capacity building and training of field functionaries to disburse transfer payments, provide financial services in SC/ST communities, and offer counseling and facilitation services.
Subcomponent 2: Improved access to productive safety nets: This sub component ensures that the eligible households from the poorest communities have access to lands that have been allocated to them by the government. It will also ensure that improvement in the quality of these lands through appropriate convergence arrangements with the MGNREGS program. These interventions will lead to significant increase in incomes by enabling the household to undertake cropping on lands that were hitherto left vacant. The activities that will be taken up as part of this sub component will include the following (i) Capacity building and training of field staff to conduct awareness about the land access programmes to community members, identifying land

issues, and follow up for resolutions (ii) Counseling on legal issues related to land improving legal awareness, also providing legal support/assistance/aid when required. (iii) Strengthening demand generation leveraging on institution platforms that exist and undertaking household level micro planning especially in terms of linking with works that can be taken up under MGNREGS Working with the line departments to ensure a sensitive response mechanism (approval of works, grounding of works and measurement) (v) Business Process Transformation (at Block, District, State and National levels) to ensure efficient service delivery from measurement of works to payments

Subcomponent 3: Improved access to vulnerability services: This subcomponent seeks to achieve an improved access to vulnerability services for Persons with Disabilities (PwDs) and Gender related services. Activities related to access to services for the PwDs to be implemented are as follows (i) Undertaking improvements to the neighborhood centres established by the department of social welfare and make these centres accessible for PWDs. Specifically for children with disabilities (ii) Formation of parent organizations of children with mental retardation and development disabilities (DD) (iii) early identification and support for children with disabilities through training of key personnel (iv) Piloting mobile therapy centers to provide specialized services to persons / children with disabilities. The team would be equipped with a mobile therapy unit that will reach various hard to reach and deficient locations to provide specialized services of special educator, physiotherapist, audiometric and speech therapist, among others. Activities related to access to gender services that will be implemented are as follows (i) Formation of Adolescent girl groups thereby strengthening the demand for awareness and redressal services (ii) Identification of all gender based vulnerable families and ensuring access to entitlements to all gender based vulnerable families (iii) Capacity building and gender sensitization to Panchayati raj functionaries and last mile workers from the line departments' grass root level workers (iv) Providing counseling services to identified vulnerable families and adolescent girls and undertaking campaigns against gender based vulnerabilities (v) Using IVRS technology and OSS for monitoring, reporting and analytics of cases related to gender based violence in SHG families (v) Setting up community managed family counseling centres and de addiction centres in convergence with other line departments.

1.3.4. Component 4: TA, ICT & Partnerships (US$ 15 million):

The objective of this component is to build an enabling ecosystem for innovation and transformation in delivering good quality services in the last mile. Recognizing that technology, innovation and entrepreneurship play critical role in addressing major development challenges the project seeks to bring together different stakeholders from the public private and civil society sectors and form partnerships with for customizing inclusive innovations in the project context. This engenders intensive use of ICT at levels of project governance and delivery, high performance project implementation and effective coordination mechanisms with supply/demand side partner institutions and social entrepreneurs and innovators by providing them technical assistance, strategic advisory and knowledge management services with national and international expertise. It will have the following 4 main sub components.

Sub Component 1: Information and Communication Technologies (ICT): The project will invest in IT applications, services and systems to achieve transformational outcomes. The key activities supported by the project include the following (i) Promoting extensive use of IT devices and enabled mechanisms for transforming the manner in which last mile services are delivered (ii)

Application Suite Development that will include an array of embedded applications for MIS data capture, community videos for capacity building and knowledge dissemination, market information and crop advisory, branchless banking transactions, GPS enabled device for spatial coordination, etc. (iii) Setting up of information bureau that will lead to the development of a data warehouse through re-engineering the existing stand-alone applications and integrating them into an integrated, real-time system with higher efficiency and robustness. (iv) Business intelligence services and data analytics support: for managing the analytics by extracting data from the current databases (v) develop need based applications specific MIS modules for APRIGP and bring together host of ICT based applications that support the project activities and improve their efficiency and effectiveness (vi) Development of Knowledge, information and transaction services.

Sub Component 2: Partnerships: The project recognizes that the partnerships as key implementation arrangement and accordingly develop a partnership framework which will allow it to enter into partnerships with innovators, social entrepreneurs and reputed agencies. The key activities to be implemented include (i) *Solutions Marketplaces, Knowledge Events:* The project will organize solutions and innovations marketplaces for identifying high impact innovations and developing productive alliances between small and marginal producers and the public, private and social enterprise sector aimed at improving technical service provision and market linkages in the project areas (ii) *Financing Public-Private-Community Partnerships:* The project will encourage productive partnerships with public, private and social enterprise sectors to increase the integration of poor in performing and remunerative value chains.

Sub Component 3: Technical Assistance to line departments: The objective of the sub component is to provide technical assistance to line departments in improving their implementation and monitoring capacity. The following key investments shall be made as part of the technical assistance to be provided to line departments (i) *Staffing support:* Staff in the form of a team of 3 to 4 professionals/YPs who could be placed within the department possibly at the state level who would be responsible for driving the convergence agenda under APRIGP (ii) Support towards ***training of the staff*** of line departments especially at the last mile (mandal/G.P level) in order to improve both the outcomes and the quality of service delivery (iii) Support towards ***consultancy services*** that could contribute to ***strengthening the MIS and data analytics*** within these line departments (iv) Support towards hiring ***agencies that could undertake periodic tracking*** of the quality of services at the household level and produce report cards based on these surveys.

Sub Component 4: Centre of Excellence and Knowledge Management: One of the key rationales for undertaking this project is that the lessons from the new approaches (value chain approach, linking value chains to nutrition, TA for line departments etc.) that will be implemented of the under the project shall be widely shared with the state rural livelihood missions (SRLMs) in low income states like Bihar, Odisha, Madhya Pradesh, Rajasthan, Jharkhand and Chhattisgarh where similar rural livelihood projects are implemented through the National Rural Livelihood Mission. Therefore, as part of this sub component, a Centre for Excellence and Knowledge management shall be set up which will enable the project to share lessons with other low income states and NRLM. The key objective is to strengthen implementation capacity of other SRLMs in piloting some of the innovative approaches to be tried out under this project. Some of the key activities

to be undertaken by the center are as follows (i) Holding Knowledge events for senior SRLM staff and other key stakeholders from the low incomes states (ii) Training and developing staff, community professionals and other stake holders (iii) Developing knowledge management and learning systems (iv) Developing best practice sites and immersion locations inside the project (v) Providing Implementation support in specific activities/locations in other SRLMs through secondment of staff and Professional Resource Persons (PRPs)

1.3.5. Component 5: Project Implementation Support (US$ 7.5 million):

The objective of this component is to strengthen the project implementation and will finance dedicated staffing for the project activities that are attributable to outcomes of the project, consultancies, training and related material, office equipment, and operational costs. It will also support establishing Monitoring, Evaluation and Learning (MEL) systems, Financial Management systems, Procurement Management, Governance and Accountability Systems, Knowledge Management and Communication, etc.

1.4. Project Location:

The APRIGP will be implemented intensively in the villages of 150 selected Mandals of 13 districts to demonstrate the effectiveness of the comprehensive livelihood approach. The Mandals have been identified on the basis of high incidence of poverty and large number of rural poor, tribal population and pockets of acute poverty. The list of project mandals is attached as *Annexure 1.*

1.5. Environment Management Framework (EMF):

The EMF for the APRIGP is an integral part of the implementation arrangements related to activities concerned with environmental implication. An Environment study was undertaken and an Environment Management Framework has been developed for the APRIGP to ensure that the project interventions are environmentally sustainable and are in compliance with applicable laws and regulations and policies of the Government of India, the Government of Andhra Pradesh and triggered safeguard policies of the World Bank.

1.5.1. Applicability of EMF to APRIG:

The EMF is applicable to 3 components of the project, component 1 – Livelihood Promotion and Component 2 - Human Development as the activities proposed under these 2 components are likely to have a bearing on the surrounding environment. EMF is also applicable to the component - 4 ICT and partnerships as an innovation forum is proposed on 'Green Business Opportunities'.

1.5.2. Objective of EMF and Approach:

The objective of EMF for APRIG is:

1. To Ensure Environmental Sustainability of Value chain and Human Development interventions proposed under APRIG and to contribute to economic enhancement by accessing premiums through Climate friendly practices in value chains and KRuSHE enterprises.

The approach is:

- Greening of the value chains and promotion of Green Business Opportunities

- Integrating environmental management into relevant activities under the Human Development component

1.6. Overview of the EMF Report:

The structure of the report is as follows.
Chapter 1 provides an overview of the Objectives and components of APRIGP.
Chapter 2 provides legal and regulatory framework that is applicable to the project activities and Chapter 3 discusses applicability of EMF to project components and provides the Environment Guidelines for the Value chains, Human Development interventions.
Chapter 4 provides Environnent Management Framework. It provides technical and institutional strategy and procedures for environment planning.
The relevant details under each chapter are attached as Annexures.

Chapter – II

2. Legal and Regulatory Framework for APRIG Project

The objective of the project is to bring in value addition interventions into different Value chain and Human Development activities that would help the producer groups and federations to increase their household incomes and attain quality life. Meanwhile it is very important to keep in mind that all the interventions by the producer groups and federations should be compliant with the laws and regulations of the country and the state i.e. the legal and regulatory frameworks based on Government of India and Government of Andhra Pradesh and Safeguard policies of World Bank. Compliance with these rules and regulations ensure alignment of these investments with sustainable management of concerned natural resources.

This chapter lists out the applicable Acts, Rules and Regulations of Government of India and Government of Andhra Pradesh. A negative list of activities is developed based on the Legal and Regulatory framework applicable to APRIGP which is provided as *Annexure 2.*

Table: 1 – Legal and Regulatory Framework applicable for APRIGP.

S. No	Act, Policy or Government Order	Relevance to APRIGP	Status
1	Environment (Protection) Act, 1986 and EIA Notification, 2006 Amended: 1991	Emission or discharge of pollutants beyond the specified standards is not permissible. (Environmental Impact Assessment (EIA) is required for specified categories of food processing industries. To provide for the protection and improvement of the environment. It empowers the Central Government to establish authorities {under section 3(3)} charged with the mandate of preventing environmental pollution in all its forms and to tackle specific environmental problems that are peculiar to different parts of the country.	Applicable. APRIGP will promote setting up of food processing units where necessary permissions are to be taken as applicable.
2	Wildlife (Protection) Act, 1972 Amended: 1993 and No.16 of 2003, (17/1/2003) – The Wild Life (Protection) Amendment Act, 2002	Destruction, exploitation or removal of any wild life including forest produce from a sanctuary of the destruction or diversification of habitat of any wild animal, or the diversion, stoppage or enhancement of the flow of water into or outside the sanctuary is prohibited without a permit granted by the Chief Wildlife Warden. The Act provides for protection to listed species of flora and fauna and establishes a network of ecologically-important Protected Areas (PAs)	Applicable.
3	Forest (Conservation) Act, 1980 The Act is an interface between conservation and development. Permits judicious	The APRIGP is unlikely to involve diversion of forest land for non-forest purposes. However, while supporting activities related to establishment of storage structures, processing centres or procurement centres, it is necessary to ensure that that land is not forest land.	Applicable. The APRIGP is unlikely to involve diversion of forest land for non-forest purposes. However, while supporting activities related to establishment of storage structures, processing centres or procurement centers, it will be done in

	and regulated use of forest land for non-forestry purposes.		accordance with Forest Rights Act given below.
4	Forest Rights Act 2006. Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.	The Act seeks to recognize and vest certain forest rights in the forest dwelling Scheduled Tribes and other traditional forest dwellers such as collection of Minor forest produce, access to grazing grounds and water bodies, traditional areas of use by nomadic or pastoral communities. The Central Government can provide for diversion of the forest for infrastructural facilities managed by Government which involve felling of trees not more than 75 per ha such as schools, hospitals, fair price shops, drinking water, irrigation, water harvesting structures, non conventional sources of energy, roads, vocational and skill training centres, community centres etc.	Applicable. Activities like infrastructure facilities, irrigation and water conservation structures are likely to happen under APRIGP as part of Value chain enhancement through Producer Organisations and Human Development components.
5	Insecticides Act, 1968 Amendment: Insecticides (Amendment) Act, 1977 (24 of 1977)	A license is required for the sale, stock or exhibition of sale or distribution of any insecticide. The use of certain insecticides are prohibited or restricted under this Act. To regulate the import, manufacture, sale, transport, distribution and use of insecticides with a view to prevent risk to human beings or animals, and for matters connected therewith.	Not Applicable. APRIGP will not involve in activities like procurement, stocking and sale of insecticides as all the crop productivity enhancement is planned through non chemical methods.
6	The Fertilizer (Control) Order, 1985	Registration is required for selling fertilizer at any place as wholesale dealer or retail dealer.	Applicable. The Non Chemical Pest Management Shops may involve in selling of fertilisers at a very small scale. Also applicable where collective procurement and distribution happens through Producer Groups.
7	The Seed Act, 1966	Selling, bartering or otherwise supplying any seed of any notified kind or variety, requires that –	Applicable. APRIGP will promote seed

		a) Such seed is identifiable as to its kind or variety; b) Such seed conforms to the minimum limits of germination and purity specified c) The container of such seed bears in the prescribed manner, the mark or Label containing the correct particulars. To provide for regulating the quality of certain seeds for sale, and for related matter	production farms at village or mandal level that supply seeds to all member farmers of Producer Groups. Also applicable in cases where mass procurement and distribution of seed is done through Producer Groups.
8	The Air (Prevention and Control of Pollution) Act, 1981 Amended: 1987, 1992 and 2003	To provide for the prevention, control and abatement of air pollution in India.	Applicable. APRIGP will involve in setting up of processing mills and food processing units which may require following prescribed standards as per the Act.
9	Public Liability Insurance Act, 1991 Amended: 1992	To provide for public liability- insurance for the purpose of providing immediate relief to the person affected by accident occurring while handling any hazardous substance and for matters connected therewith or incidental thereto.	Not Applicable. Activities under APRIGP are not likely to involve in handling of any hazardous substances.
10	Noise Pollution (Regulation & Control) Rules, 2000	To regulate and control noise producing and generating sources with the objective of maintaining the ambient air quality standards in respect of noise.	Applicable. Activities under APRIGP such as mills and processing units and construction activities shall take into consideration all aspects of noise pollution to avoid noise menace.
11	Indian Forest Act, 1927	To consolidate the law relating to forests, the transit of forest-produce and the duty leviable on timber and other forest-produce. No fresh clearings for cultivation or for any other purpose shall be made in such land except in accordance with such rules as may be made by the State Government in this behalf. In the case of a claim relating to the practice of shifting cultivation, the Forest Settlement-officer shall record a statement setting forth the particulars of the claim and of any local rule or order under which the practice is allowed or regulated, and submit the statement to the State Government, together with his	Applicable. Applicable to APRIGP where shifting cultivation is in practice by beneficiary members.

		opinion as to whether the practice should be permitted or prohibited wholly or in part. In the case of a claim to rights of pasture or to forest-produce, the Forest Settlement-officer shall pass an order admitting or rejecting the same in whole or in part.	
12	The Water (Prevention and Control of Pollution) Act 1974 Amended: 1988.	To provide for the prevention and control of water pollution, and for the maintaining or restoring of wholesomeness of water in the country. No person shall knowingly cause or permit any poisonous, noxious or polluting matter determined in accordance with such standards in to stream or well or sewer or on land. No person shall cause or permit to enter into any stream any other matter which may tend, either directly or in combination with similar matters, to impede the proper flow of the water of the stream in a manner leading or likely to lead to a substantial aggravation of pollution.	Applicable. Applicable to activities under APRIGP where water from small scale industries and food processing units release wastes that have pollutants that are likely to enter into water bodies.
13	The Biological Diversity Act, 2002	To provide for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental thereto.	Applicable. Applicable to APRIGP where collection of minor forest produce and processing is involved.
14	The National Green Tribunal Act, 2010	The National Green Tribunal Act 2010 is approved by the President of India on June 2, 2010. It provides for establishment of National Green Tribunal- a special fast-track court for speedy disposal of environment-related civil cases. Industrial operations and processes shall be carried out as per the safeguards under Environment Protection Act 1986. Compensation and relief for any damage to people (death or injury), property and environment.	Applicable. Applicable in areas where damage to property, environment happens due any to development activities.

15	Coastal Regulation Zone Notification 2011, and Island Protection Zone Notification 2011	The new notification replaces CRZ 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. In the latest notification the no development zone' is being reduced from 200 meters from the high-tide line to 100 meters only to meet the increased demands of housing of fishing and other traditional coastal communities.	Applicable. Applicable in areas where processing units are to be located near Coastal Regulation Zone.
16	Indian Fisheries Act 1897	Use of dynamites or explosives or poison for fishing is an offence.	Applicable. Applicable to APRIGP where capture fisheries is involved.
17	Fruit Product Order (FPO) 1955.	Fruit Products Order -1955, is promulgated under Section 3 of the Essential Commodities Act - 1955, with an objective to manufacture fruit & vegetable products maintaining sanitary and hygienic conditions in the premises and quality standards laid down in the Order. It is mandatory for all manufacturers of fruit and vegetable products including some non fruit products like non fruit vinegar, syrup and sweetened aerated water to obtain a license under this Order. Following minimum requirements are laid down in the Fruit Product Order for hygienic production and quality standards: (i) Location and surroundings of the factory (ii) Sanitary and hygienic conditions of premises (iii) Personnel hygiene (iv) Portability of water (v) Machinery and Equipment with installed capacity (vi) Quality control facility and Technical staff (viii) Product Standards	Applicable. Applicable to all fruit based processing units are planned under APRIGP.

		(viii) Limits for preservatives and other additives	
18	The Food Safety and Standards (Food Products Standard and Food Additives) Regulations 2011	The Food Safety and Standards Authority of India (FSSAI) has been established under the Food Safety and Standards Act, 2006 as a statutory body for laying down science based standards for articles of food and regulating manufacturing, processing, distribution, sale and import of food so as to ensure safe and wholesome food for human consumption.	Applicable. Applicable to food manufacture and processing units under APRIGP.
19	Prevention of Food Adulteration Act, (PFA) 1954	Broadly, the PFA Act covers food standards, general procedures for sampling, analysis of food, powers of authorized officers, nature of penalties and other parameters related to food. It deals with parameters relating to food additives, preservative, colouring matters, packing and labelling of foods, prohibition and regulations of sales etc.	Applicable. Applicable to food manufacture and processing units and KRuSHE marts selling food products under APRIGP.
20	Agricultural Produce (Grading and Marking) Act, 1937 (Act No. 1 of 1937) (as amended up to 1986)	To Provide for the grading and marketing of agricultural and other produce.	Applicable. Applicable to agricultural produce marketing under APRIGP.
21	The Bureau of Indian Standards Act 1986.	An Act to provide for the establishment of a Bureau for the harmonious development of the activities of the standardisation, marking and quality certification of goods and for matters connected thereto.	Applicable Applicable to agricultural produce marketing under APRIGP.
22	The Export Inspection Council of India and the Export (Quality Control and Inspection) Act 1963	The Export Inspection Council (EIC) was set up by the Government of India under Section 3 of Export (Quality Control and Inspection) Act, 1963 (22 of 1963), in order to ensure sound development of export trade of India through Quality Control and Inspection and for matters connected thereof.	Applicable. Applicable to value chains where export of commodities or processed products is planned under APRIGP.
23	Hazardous Waste (Management &	It is mandatory under the provisions of the Hazardous Waste (Management & Handling) Rules, 1989 framed under section 6, 8	Applicable. Applicable to small scale enterprises

	Handling) Rules1989.	and 25 of Environment (Protection) Act, 1986 for any person handling hazardous wastes, as categorized in the Schedule-I & II to obtain authorization of the State Pollution Control Board for collection, reception, storage, transportation, treatment and disposal of such wastes.	under APRIGP which may involve handling of Wastes from Dyes and Dye intermediate containing organic chemical compounds (50 kgs per year), waste oils and oil emulsions (100 kgs per year) phenols (5 kgs per year), acid alkaline slurry (200 kgs per year). The list of banned dyes is attached as *Annexure 3.*
24	Plastics Wastes Rules, 1999	Manufacture, sale and use of recycled and coloured plastic carry bags less than 20 microns in thickness in the state is banned and levying penalties for violation under Environment Protection Act, 1986.	Applicable. Applicable to Rural marts where use of plastic bags is possible during sale of provisions etc.
25	e-waste (management and Handling) Rules, 2011	Consumers or Bulk consumers of electrical and electronic Schedule I shall ensure that e-waste generated by them is channelized to the authorised collection centre(s), or registered dismantler(s) or recycler(s) or is returned to the pick up or take back service provided by the producers; and Bulk consumers shall maintain record of e-waste generated by them in the Form 2 and make such record available for scrutiny by the State Pollution Control Board or the Pollution Control Committee concerned.	Applicable to APRIGP as tablets will be purchased under ICT component.
26	Classification of industries for consent management [Red, Orange & Green Categories]	Consent is required for setting up and operation of different categories of industries from State Pollution Control Board. Category wise list placed in *Annexure 4.*	Applicable. Applicable to APRIGP where mills, processing units and small scale enterprises will be set up.
27	The Disaster Management Act, 2005	An Act to provide for the effective management of disasters.	Applicable. Applicable to small scale enterprises and construction projects that need prescribed standards.
National Policies			
28	National Forest Policy 1988	To ensure environmental stability and maintenance of ecological balance (direct economic benefits being considered)	Applicable.

		• Area under forests • Afforestation, social forestry, and farm forestry • Management of state forests • Rights and concessions • Diversion of forest lands for non-forest purposes • Wildlife conservation • Tribal people and forests • Shifting cultivation • Damage to forests from encroachments, fires and grazing • Forest-based industries • Forest extension • Forestry education • Forest survey and database • Legal support and infrastructure development • Financial support for forestry	
29	National Water Policy, 1987 and 2002	To ensure that planning, development and management of water resources are governed by national perspectives.	Applicable.
Environmental safeguard policies of the World Bank			
30	Environmental Assessment (OP 4.01)	The Bank requires environmental assessment (EA) of projects proposed for Bank financing to ensure that they are environmentally sound and sustainable, and thus to improve decision making.	Applicable.
31	Natural Habitats (OP 4.04)	The Bank does not support projects that, in the Bank's opinion, involve the significant conversion or degradation of critical natural habitats.	Applicable. Applicable APRIGP where Value chain and Human Development activities happen in tribal areas.
32	Pest Management (OP 4.09)	In Bank-financed agriculture operations, pest populations are normally controlled through integrated pest management 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 does not finance formulated products that fall in WHO	Applicable. APRIGP will not finance pesticide procurement, but there is possibility of pesticide use by farmers as part of productivity enhancement efforts. The commonly used pesticides in

		classes IA and IB, or formulations of products in Class II, if (a) the country lacks restrictions on their distribution and use; or (b) they are likely to be used by, or be accessible to, lay personnel, farmers, or others without training, equipment, and facilities to handle, store, and apply these products properly.	India and their status as per WHO classification list is attached as *Annexure 5.*
33	Forests (OP 4.36)	The Bank distinguishes investment projects that are exclusively environmentally protective (e.g., management of protected areas or reforestation of degraded watersheds) or supportive of small farmers (e.g., farm and community forestry) from all other forestry operations. Projects in this limited group may be appraised on the basis of their own social, economic, and environmental merits. The Bank finances plantations only on non-forested areas (including previously planted areas) or on heavily degraded forestland.	Applicable. Applicable APRIGP where value chain and Human development related interventions happen in tribal areas located near forests.
		State Regulations	
34	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	Applicable. Applicable to APRIGP in tribal areas where the activities involve interaction with reserve forest areas for any of the activities under value chains.

		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, 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 wilfully 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	

	The Andhra Pradesh Forest (Amendment) Act, 1997	It prohibits absolutely or regulates, subject to such conditions in the entire state of Andhra Pradesh or within such local limits as may be specified, the establishment of pits or machinery for sawing, converting, cutting, burning, concealing or making of timber, the altering or effacing of any marks on the same, of the possession or carrying of hammers or other implements used for marking timber.	
35	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	Applicable. Applicable to APRIGP in tribal areas where the activities involve interaction with protected forest areas for any of the activities under value chains.

		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	
36	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.	Applicable.
	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.	Applicable. Applicable to productivity enhancement activities under agriculture commodity value chains where interventions may involve sinking of bore wells, and Human Development interventions involving drinking water supply.
	Land and Soil	No brick manufacturing shall be taken up in areas where the soil is prone to erosion and depletion. Sand mining shall not be carried out within 500 metres of any existing structure (such as bridges, dams, weirs, or any other	Applicable. No brick manufacture activities are planned but there is possibility of groups handling sand mining and

		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 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, Penna) sand mining may be permitted without affecting existing irrigation, drinking water or industrial uses. Sand mining shall not be permitted within 15 metres or 1/5th of the width of the stream bed from the bank, whichever is more. In streams and rivers where the thickness of sand is quite good (more than 8 metres), the depth of removal may 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.	related activities as value chains under APRIGP in future. The detai list of Do's and Don'ts is provided in negative list in Annexure 1.
	Surface Water	No undesirable wastes including liquid wastes shall be allowed to be dumped in the water bodies by any person or organization.	Applicable. Applicable to APRIGP activities such as food processing, milk chilling units and small scale enterprises that may involve disposal of wastes into surface water bodies.
	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	Applicable. Applicable to APRIGP where felling of trees may happen for

		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	infrastructure provision – procurement centres, storage godowns, mills and processing units.
37	The Andhra Pradesh Saw Mills (Regulation) Rules, 1969	No person shall install, erect or operate a Saw Mill (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 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.	Not applicable. APRIGP will not support any saw mills.
38	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 cm 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.)	Applicable. Applicable to the activities which involve transport of forest produce or fuel wood for any manufacture, processing units or small scale enterprises.
39	The Andhra Pradesh Minor Forest Produce	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	Applicable. Applicable to small scale enterprises under APRIGP based on Minor

	(Regulation of Trade) Act, 1971	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, 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 there under. Every manufacturer of finished goods using minor forest produce, and every exporter of minor forest produce shall get himself /herself registered.	Forest produce.
40	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.	Applicable. Applicable to activities involving collection and sale of minor forest produce.
41	The Andhra Pradesh Preservation of Private Forest Rules, 1978.	The Forest area situated in Patta land is a Private Forest. No permission for felling of 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*)	Applicable. Applicable to infrastructure related activities that require cutting of trees for construction.

		6. Chinta (*Tamarindus indica*) 7.Panasa (*Artocarpus integrifolia* and *Artocarpus hirsuta*) 8. Karaka (*Termalia chebula*) 9. Tuniki (*Diospyrosmalonaxylon*) 10. Kanuga (*Pongamia glabra*) Permission to cut the following reserved trees shall not be granted unless the trees exceed 120 cm in girth at 1.3 m 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.KondaTangedu (*Xylya dolabriformis*)	
42	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, barren 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	Applicable. Applicable to infrastructure related activities that require cutting of trees for construction, and manufacture or processing activities that require fuel wood.

		• Damaging, altering, removing any fence or live hedge fence	
43	Andhra Pradesh Marine Fisheries act 1994	The area upto 8 km from the shore is reserved for traditional craft. (ii) Mechanised boats are allowed to operate beyond 8 km. (iii) Mechanised fishing vessels of 25 Gross tonnage and above or 15 m and above of length shall be allowed to operate only beyond 15 km from the coast. (iv) No vessel to be engaged in fishing using nets with mesh size below 15 mm. (v) Shrimp trawlers engaged in fishing without Turtle Excluder Device (TED) shall be liable for confiscation of entire catch and impose a fine of Rs. 2,500/-.	Applicable to APRIGP where interventions in marine fishing are proposed.
44	The Marine Fishing (Regulation) Act 1994.	Ban or closed season to be observed from 15th April to 31st May during breeding season in order to conserve fish stocks and biodiversity. The mesh size of net used by traditional and mechanised vessels should not be less than 1/2 inch. Traditional crafts are not allowed to fish beyond 8 kms from the shore. Mechanized vessels below15 mts OAL should operate beyond 8kms only and above 23 OAL beyond 23 kms. All mechanized fishing boats and other vessels operation should be registered or notified to the Fisheries Commissioner. The vessels with license will only be permitted to conduct fishing. Owner shall you only the chemicals that are permitted for preservation	Applicable to APRIGP where interventions in marine fishing are proposed.
45	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.	Not Applicable. No charcoal related activities are proposed under APRIGP.

Chapter – III

3. Applicability of EMF to APRIGP Components - Environment Impact of Activities under APRIGP and Environment Friendly Alternatives

This section discusses applicability of EMF to the components of APRIGP, presents environmental issues that might arise from the proposed activities under APRIGP and the recommendations/mitigation measures to be put in place to address the negative impacts. The environment guidelines to help in bringing in sustainability to project activities are provided.

EMF is applicable to 3 components of APRIGP.

Component	Applicability of EMF
Component 1 – Value chain enhancement through producer organizations.	The value chain enhancement has several steps like productivity enhancement, processing, manufacture storage etc. EMF is applicable at every stage of value chain
Component 2- Human Development	Environment guidelines in Water and Sanitation, Nutrition interventions etc.
Component 4 – ICT and Partnerships	Guidelines for E waste management. Innovation forum under Partnership component for 'Green Business Opportunities'

3.1. Component 1: Value Chain Enhancement through Producer Organizations:

This component has two sub-components viz. Rural Value Chains and Rural Retails Chains/Small Enterprises.

3.1.1. Subcomponent 1 – Rural Value Chains

The component will focus on adding value through investment in economic organizations of small and marginal farmers like producer organizations and producer companies and investments in value addition, quality enhancement and partnerships with agribusiness enterprises in the private and cooperative sector. A *value chain approach* will be adopted in key sub-sectors like agriculture, plantation and horticulture crops, livestock and fisheries.

The sub component 'Rural Value Chains' deals with value chains of 6 agricultural commodities and 4 animal husbandry activities listed below:

1. Paddy
2. Red gram
3. Turmeric
4. Cashew nut
5. Pine apple
6. Coffee

7. Dairy
8. Small ruminants
9. Poultry
10. Fisheries

The value chain activities will broadly include interventions for productivity enhancement, processing, storage and marketing. These interventions are likely to have a negative impact on environment by:

- Possible over exploitation of the resources such as ground water for irrigation to enhance the productivity
- Introducing high yielding varieties which need intensive irrigation, fertilization that have negative impact on soil and water
- Setting up mills, processing units and storage structure which need high energy requirement and may release wastes that are harmful to the environment.

The negative impacts need to be addressed or can be avoided by opting for an environment friendly alternative available. The 'environment guidelines' or 'environment friendly alternatives' for the commodity value chains are presented hereunder:

3.1.1.1. Environmental Guidelines for Agriculture Commodity Value Chains (Rural Value Chains)

Table 2: Agriculture Commodity Value Chains: Environmental issues and best practices in Interventions for Productivity enhancement, Storage, Processing etc.

S. No	Interventions	Environmental Impacts	Measures
1	Commercial Seed Production through Seed village concept	Improper Varietal selection may have impact on local biodiversity besides input cost and yield.	Suitable varieties based on soil and climatic conditions as recommended by Agriculture dept to be selected. Good yielding traditional varieties having demand in market to be encouraged with the help of suitable technical agencies. Seed replacement to be considered as a resort only when traditional varieties do not respond to improved cultural practices.
		Replacement of traditional seed varieties with High Yielding Varieties could lead to loss of local biodiversity.	In cases where traditional varieties are being replaced maintain gene banks of traditional varieties for any future use in the village with help of farmers and any interested NGOs or State Biodiversity Board.
		Any technical lapse in seed production might lead to low quality germplasm or local land races might be contaminated when improved varieties are produced without proper precautions.	Partnering with institutions for technical support. Eg: KVK, Agriculture department at Mandal level etc.

2	Productivity enhancement	Interventions for productivity enhancement might lead to the following impacts:	
		Excess use of ground water for intensive cropping depleting the ground water resource.	Use water efficient methods of irrigation like drip especially for horticultural crops.
		Increased use of pesticides in more quantities than desired leading to runoff into water bodies and polluting them and polluting environment, negative effects on health etc.	Restrict to non chemical methods of Pest management. Avoid use of pesticides banned and restricted by World Health Organisation (WHO).
		Soil degradation due to fertilizer use in more quantities and high uptake of nutrients due to high responding varieties.	Adopt organic manuring practices as far as possible. Any chemical fertilizer application should be based on soil testing.
		Lack of information on weather updates may lead to untimely operations leading to crop loss due to unexpected dry spells or rains.	The member farmers can be linked with sms based weather update systems to avoid untimely operations. Eg: Strategic Pilot on Adaptation to Climate Change (SPACC) project.
3	Drying	Storage of grains and products like turmeric, cashew, coffee etc. needs drying to attain prescribed moisture level to avoid pest and disease infestation which may call for chemical use for management.	Dry the product to attain prescribed moisture level.
		Drying on open grounds may contaminate the produce with dirt, microbes etc. which will reduce the quality of produce will have an impact on health.	Drying on cement platforms, mats etc. will protect the produce from contamination. Use solar dries wherever possible.
4	Storage	Storage facilities when not properly ventilated will attract pest and moisture which will spoil the produce. And pest infestation may lead to pesticide use which may leave harmful residues on produce.	Storage facility should be well ventilated and free of moisture seepage. Care must be taken to ensure this during construction or renting of such facilities.
		Storage pest infestation is a common problem during storage. Stored product pest control involves use of fumigants	Follow natural methods of storage pest control such as impregnating gunny sacks in neem oil, using dried

		which leave residues on food products and are harmful for health. Chemicals stored along with food commodities may contaminate the produce or give off flavors. Organic produce stored along with non organic produce may lead to adulteration.	neem leaves, repairing all crevices cracks in the godown etc. Chemicals/pesticides/weedicides / fertilizers should not be stored along with food commodities It is advisable to store organic produce separately.
5	Milling	Noise pollution to the workers and in the neighborhood due to milling. Fine dust during milling will lead to health issues like allergy, asthma in long run.	Noise protective equipment should be provided to the operator of the machines. Silencer should be attached to the equipment to reduce noise from the equipment to surrounding areas. Person using these machines must wear mask for preventing the problem related to inhalation.
6	Processing and value addition	Processing and value addition may require high amount of energy and water depleting local fuel and water resources and increasing emissions due to energy use. Accidents and health hazards are possible during processing involving machinery. Unhygienic environment or practices at processing will contaminate the food products.	Use enenrgy efficient equiepment for processing (such as steam boilers in turmeric, steam roaster in cashew or aqua pulper in coffee). Take safety precautions and use safety gear during processing. The processing environment should be kept clean and personal hygiene is must among the workers.
7	Transport	Organic produce may get contaminated when transported along with other non food commodities like fertilizers, pesticides etc.	Vehicles used for transport for chemicals should not be used for transport of edible produce. The vehicle should be cleaned and dried before transportation of food grains etc.
8	Waste disposal	Disposal of wastes openly after milling or waste (water, seed coats, peels, etc.) after processing may create unhygienic environment due to decomposition.	Explore the alternate uses for the wastes, in cases where they cannot be put to alternate use dispose the wastes as per the prescribed procedures.
9	Adoption of environment guidelines	Lack of awareness may lead to non adoption of the guidelines	Awareness and training programmes need to be organized for community and involved stakeholders.

<u>Good practices that enhance the value:</u>

- Demonstration Plots and FFS – with reference to demonstration plots and farmer Field Schools the demonstrations should be accurate based on scientific explanation to enhance adoption. Any mistakes or loopholes will reduce confidence among farmers.

Common Infrastructural facilities to be provided across APRIGP in Agriculture Commodity value chains:

While the productivity enhancement, processing and storage interventions could vary from crop to crop (which are given in *Annexure 6*), there will be some common infrastructure related interventions required for all the crops.

- *Upgraded custom Hiring centres:*
  Twenty-one districts already have several custom hiring centres initiated under CMSA at the cluster level. Some of the instruments provided to these custom hiring centres are power tillers, sprayers, markers, weeders, neem pulverisers, grinders for preparation of botanical extracts etc.
- *Non Chemical Pest Management (NPM) shops:*
  Already existing NPM shops in the Mandal will be upgraded in order to meet the demand for NPM products and wider promotion of NPM concepts.
- *Procurement centre at Mandal level:*
  Two acres of land will be taken on rent for a period of 2 months in the harvesting period for procurement of the harvest.
- *Storage warehouse cum wholesale outlet:*
  A brick and mortar structure will be indentified or erected in order to enable storage of collected grains and help the farmers to get the benefit of the sale of the milled rice grains to the end consumer.
- *Transport to and from procurement centre or storage ware house:*
  Transportation of procured products needs hiring of vehicles.

Table 3: Environmental Issues and Best practices in creation and maintenance of common infrastructural facilities provided to support the value chains:

S. No.	Interventions	Environmental Impacts	Measures
1	Upgraded Custom Hiring Centres	Spread of weeds and pathogens from one field to other field through uncleaned farm machinery and implements. This will further encourage use of fungicides and weedicides.	Clean machinery and tools after every use to ensure no weed seed, pathogens etc. are carried over to next field.
		Use of some of the machinery such as Power Weeders, Power sprayers and Power tillers will increase use of fuels and will cause emission of GHGs (Green House Gases). The exhaust fumes from this farm machinery pollute local environment quality.	Ensure purchase of fuel efficient models of this equipment. Proper maintenance (regular cleaning and service) would lead to enhanced efficiency.
		There can be some safety hazards owing to use of machinery.	Awareness on safe use and first aid requirements to be ensured.

2	Non Chemical Pest Management Shops (NPM shops)	Storage of botanical ingredients like neem seed for long time without proper drying etc. Will lead to spoilage of the raw material through molds or even have impact on human health and quality of NPM preparations (extracts).	Proper drying and storage in a dry and shaded place will ensure longevity of the raw material and quality of the extracts
		Continuous handling of botanical extracts, raw materials like neem, tobacco etc. might cause health hazards. Though neem is a plant with numerous health benefits its overuse and constant exposure may lead to some allergic reactions such as rash or hives, itching, swelling of the mouth or throat, wheezing, difficulty in breathing etc. Neem can be toxic to children and its consumption may lead to vomiting, loose stools, drowsiness, anaemia, seizure etc.	Use of safety gear like gloves and nose masks and hand washing with soap should be promoted after handling of botanical extracts and their ingredients.
		Collection of plant material for preparation of botanical extracts in excess quantities might affect the regeneration capacity of the specific plant species in the area.	Collection should ensure enough propagules are left for regeneration so as to ensure sustainable harvest of raw materials. Compensatory plantation of the plant species used to ensure sustainable use.
		Untimely use of NPM principles and non usage in optimum quantities may not result in desired outcome leading to chemical application again.	Proper use in proper dosages should be ensured for better results.
		Preparation of botanical extracts involves use of fuel wood for boiling which may impact local fuel wood resources and generates smoke which is harmful to health.	Smokeless chulha can be promoted for reducing its ill effects on health.
3	Procurement centre at Mandal level	Movement of vehicles to and fro transporting the procured grains may result in dust. Clearing of vegetation may affect local biodiversity and local environment.	Frequent water sprinkling on the road and near ground to avoid excessive dust. Avoid clearing to vegetation to the extent possible. In case of necessity to clear the vegetation take required permissions and do compensatory plantation.
4	Storage warehouse at	Construction of a brick and mortar structure for storage would involve	Careful selection of site in order to avoid trouble for neighboring

	Mandal level (this storage structure will also act as a point to wholesale marketing point for the grains)	following negative environmental impacts: • Possible clearing of vegetation or cutting of trees to set up the structure would involve negative impact to the environment. • Construction waste, solid waste and heat and pollution affect the local environment quality. • Open disposal of debris near the site or near drains etc. will cause inconvenience and block drains. Unfilled borrow pits are a hazard, leading to accidental falls, water stagnation etc. Lighting equipment in storage houses with high energy consumption leads to GHG emissions.	people. Minimize the need for cutting the trees and damage to native vegetation. Take required permissions (as indicated in negative list and legal and regulatory framework) in case of need to cut trees. Compensatory plantation if there is any vegetation loss. Frequent water sprinkling near storage area and approach road to avoid excessive dust during construction. Dispose the debris away from the site preferably in landfills or use for activities like road construction. Fill all the borrow pits to avoid hazards like accidental falls, water stagnation etc. Use of LED lighting can reduce the electricity consumption drastically. Providing adequate natural ventilation during construction will reduce the need for energy consumption for lighting. Collaborate with municipal authorities for temporary or permanent road widening to cater to the additional truck traffic and future traffic. Avoid truck traffic during morning and evening rush hours.
		Environmental impacts during operation of the storage warehouse might have the following impacts • Flocking of vehicles around the warehouse will generate air pollution and noise pollution. • Improper storage may lead to	Store the grains on elevated structures (dunnage) to avoid direct contact with floor and to provide aeration. Bags should not touch the walls to prevent the absorption of moisture and serve as hiding

		spoilage of produce through mold infestation, pest attack and may encourage use of chemicals and fumigants. Water leakage in godowns will encourage molds and there by chemical use.	places for rats. Fix Zinc sheets at the bottom of the wooden doors to prevent entry of rats. Block all drainage holes with wired mesh and use rat traps. Rats can be killed with bait of balls made of horse gram flour and cotton thread or flour mixed with cement. Mix leaves of Neem, Karanj, Custard apple, Adathoda and Tulsi to protect grains from storage insects. Storage location should be high and not prone to flooding. Jute bags are placed in lots of 6 (Breadth) x 10 (length) x 7 m (Height) on wooden platform or concrete blocks on the ground with a gap of 15 cm between the floor and the bag.
5	Hiring transportation agency for aggregation and transportation.	Transportation agency with old and ill serviced vehicles may cause more emissions.	Collective transportation by transportation agency using well serviced vehicles will lead to efficient utilization of vehicles, will minimise fuel consumption and will ultimately lead to less emission of green house gases.
6	Adoption of environment guidelines	Lack of awareness may lead to non adoption of the guidelines	Awareness and training programmes need to be organized for the members.
<u>Good practices that enhance the value:</u> • Lack of proper ventilation and improper stacking of bags will encourage storage pests and molds. Proper ventilation should be provided during construction. • Leakage proof construction with better drainage facility to drain the clean water etc. ensures safe storage of the produce.			

3.1.1.2. Environmental Guidelines for Livestock Value Chains

Background:

Dairy: APRIGP milk producers with a target to improve production of milk through best livestock management practices. The interventions will include induction of high yielding animals, capacity building, fodder requirements etc. The interventions will be in 2 districts - Chittoor and Prakasam in Andhra Pradesh.

Poultry: APRIGP is planning to reach poultry producers to produce quality chicken meat and improve production of eggs through best poultry management practices. The key interventions include introduction of dual purpose birds, improving access to better veterinary services, access to low cost inputs, convergence with suppliers and marketing tie ups.

Small ruminants: APRIGP targets goat and sheep producers to improve production of meat by adopting better management practices. The key interventions proposed include induction of small ruminants, increasing productivity of animals by adopting better management practices and access to veterinary services and establishing marketing channels.

Fisheries:

Dry fish:

APRIGP will target 20,000 fry fish producers and to market 1,60,000 tons of quality dry fish processed under hygienic conditions. The key interventions will include input arrangement and marketing, quality enhancement, value addition, certification and improving market access. The intervention will be implemented in 67 mandals of 9 coastal districts of Andhra Pradesh – Srikakulam, Vizianagaram, Visakhapatnam, East Godavari, West Godavari, Krishna, Guntur, Prakasam and Nellore.

Wet fish:

APRIGP will target 30,000 producers to market 2,40,000 tons of processed and cleaned wet fish. The key interventions include hygienic processing and value addition, packaging, certification and marketing.

Table 4: Environmental Issues and Best practices in Livestock (dairy, small ruminants, poultry and fisheries) related value chains:

S. No.	Interventions	Environmental Impacts	Measures
1.	Legal requirements	Permission etc. may be required for grazing near forest areas, fishing etc.	Required norms should be met as per the recommendations given in legal and regulatory framework and commodity wise guidelines.
2	Selection of breeds and varieties (in dairy, small ruminants, poultry and fisheries)	Breeds and varieties that are not suitable to the location may not perform well and increase the cost and effort on resources like and fodder, water, feed etc. for maintenance.	Select locally suitable breeds and varieties that respond well to the local conditions there by reducing external inputs and maintenance costs

3	Shed, spacing stocking density etc.	Improper spacing, over stocking leads to disease spreads and there by use of curative drugs etc.	Recommended ratio of spacing, stocking etc. to be followed for health of the animals. Details are provided in Annexure 6.
4	Feed management	Over grazing livestock or wastage during stall feeding leads to stress on environment.	Grazing or feeding of livestock should be as per the recommendations (provided in the A*nnexure 6*)
5	Waste management (in dairy and poultry)	Open disposal of wastes leads to unhygienic environment.	Waste disposal should be through composting or putting to alternate use etc. as provided in activity specific guidelines.
6	Disposal of carcasses (dairy and poultry)	Open disposal leads to contamination of water resources and leads to spread of diseases in case of diseased animals.	Recommended methods of disposal such as burying or burning should be followed.
7	Value addition (milk cooling, fish processing etc.	Energy use and waste disposal could be an environmental issues in value addition	Prescribed standards are to be followed as suggested in commodity wise guidelines in *Annexure 6.*
8	Adoption of environment guidelines	Lack of awareness may lead to non adoption of the guidelines	Awareness and training programmes need to be organized for the members.

Commodity wise environment guidelines are presented in *Annexure 6*, along with list of support agencies which can be used for greening specific value chains during the preparation of business plans.

3.1.2. Subcomponent 2 – Rural Retail Chains/Social Enterprises

This sub component aims to derive social impact in terms of delivery of enhanced and improved quality of consumption at a rural household, by making available good quality, affordable, safe and nutritious food items, personal hygiene products, other essential goods and essential services to the poorest of the poor households by organizing a network of (existing) rural retail outlets (KRuSHE Marts) and (existing & new) home-based enterprises (KRuSHE Enterprises).
This section discusses the potential environmental issues and environment friendly alternatives (environment guidelines) for KRuSHE Enterprises and KRuSHE marts.

KRuSHE Enterprises:

KRuSHE Enterprises are divided in to two major categories – farm products and nonfarm products.

1. **Farm products:** Farm products include food products like highly nutritional products, value added agriculture products, processed value added horticulture products eg: pine apple juice, jam, jelly, powders like turmeric, chilli, coriander etc., pickles, dry fish and fresh fish etc.

2. **Non Farm products:** Non farm products includes chemical products eg: phenyl, detergent, liquid blue, soap, agarbatti, candles, pain balm, chalk piece etc, textile products and handicraft eg: Dwacra crafts leather crafts, wrought iron crafts etc.

The farm and non farm products that KRuSHE enterprises will deal with are presented below:

Farm Products	**Non Farm products**
Ginger products	Textiles
Hill brooms	Handlooms
Leaf plates	Hand bags
Tamarind	School bags
Chilli powder	Candles
Masala powder	Bangles
Turmeric powder	Agarbathi
Cashew nut	Rangoli
Pickles	Soaps
Rice mill	Detergents, washing powder
Bengal gram dal	Phenyl
Dry copra	Pain balm
Herbal products	Chalk pieces
Redgram dal	Shampoo
Sesamum oil	Paper plates
Mango jelly	Acids
Coconut oil	Liquid blue
Ground nut	Salt
Honey	Paper covers
Vermicelli	Footwear
Sweet, milk products	Basket making
Snacks and bakery	Mineral water
Papads	Coir products
Dry fish	

Environment Impacts of KRuSHE Enterprises:

Negative impact on environment is possible during various steps in processing and manufacture of farm and non farm products. The environmental impacts and eco friendly alternatives for different activities allied with KRuSHEE Marts and the mitigation measures are presented hereunder:

3.1.2.1. Environment Guidelines for Processing and value addition of Farm products

Table 5: Potential Environmental issues and Environment friendly alternatives in farm based food product preparation include:

S. No	Activity in the value chain or steps in the process	Possible issues	Interventions, Best practices
1	Registration, licenses and permissions	Manufacturing and selling of chemical products without registration and license is illegal. Food processing units also need licenses along with small scale industries.	Registration of unit under DIC is required. Pollution Control Board (PCB) permissions are required based on type of activity. Food processing units should obtain licenses.
2	Storage of raw materials and finished products.	Improper storage of raw materials i.e. in moist, unclean conditions leads to spoilage or contamination of the products and chemical raw materials poses health risks to the people around. Few materials lead to explosions and fire hazards when not stored in required manner.	Raw materials should be properly stored in containers with lids in clean and dry place (prescribed standards are to be followed for each material). Finished products should be properly labeled with manufacture and expiry dates and stored in clean and dry place.
3	Manufacture	Manufacture without following prescribed standards under health and hygiene affects the quality of produce.	The machinery should be kept clean and the workers should follow the prescribed standards of hygiene such as bathing, hand washing, using gloves, masks and hair caps etc.
4	Use of additives, preservatives	Use of non permitted additives and preservatives is illegal and pose health risks to the workers and consumers.	Only the permitted additives and preservatives should be used as per the recommendations given in activity specific guidelines in the *Annexe 2 of Annexure 7.*
5	Energy use	Energy is required for heating, boiling, grinding, extraction, drying etc.	In case of cooking fuel efficient devices should be used. Biomass or solar devices can be promoted to conserve energy.
6	Use of water	Water is required for cleaning, washing, boiling etc.	Water efficient devices should be promoted.
7	Maintenance and upkeep of machinery	Irregular cleaning or maintenance will lead to contamination and improper functioning. Possibility of accidents during handling machinery.	Regular upkeep should be followed as per the prescribed standards. Personnel should be well trained and first aid kit should be available.

8	Waste disposal	Open disposal of decomposable wastes leads to contamination of surroundings though decomposition, attracting insects, leaving chemical residues etc.	Wastes should be properly disposed as per the recommendations given in activity specific environment guideline s given in *Annexure 7.*
9	Facilities at processing and manufacturing centres.	Lack of required basic amenities will affect health of workers.	The work space should be ventilated to the extent possible. Should have drinking water and toilet facilities.
10	Adoption of environment guidelines	Lack of awareness may lead to non adoption of the guidelines	Awareness and training programmes need to be organized for the workers and entrepreneurs.

3.1.2.2. Environment Guidelines for Manufacture of Non Farm products

Table 6: Potential Environmental issues and Environment friendly alternatives in nonfarm based enterprises include:

S. No	Activity in the value chain or steps in the process	Possible issues	Interventions, Best practices
1	Registration, licenses and permissions	Manufacturing and selling of chemical products without registration and license is illegal.	Registration of unit under DIC and chemical license and testing for toxic material is required with help of Pollution Control Board.
2	Raw material (Chemical)	Poor quality raw material lead to burning of hands, breathing problems etc. during preparation and end use of the product.	Authentic source of raw material and suppliers to be ensured and training on proportion of raw material to be mixed up can be given.
3	Storage of raw materials and finished products	Improper storage of raw materials leads to spoilage or contamination of products.	Raw materials should be properly stored in containers with lids in clean and dry place as per prescribed standards Finished products should be properly labeled with manufacture and expiry date and stored in clean and dry place.
4	Processing and manufacture	Manufacture without following prescribed standards affects the health of workers.	Hand gloves, nose masks and goggles should be used while handling the raw materials or finished products.
5	Energy use	Energy is required by machinery for heating, running mixing, packing, etc. and will have impact through GHG emissions.	Green sources of energy can be promoted to conserve energy based on feasibility.
6	Use of water	Water is required for cleaning, washing, boiling etc. As the requirement is in large quantities this will have impact on local water resources.	Water efficient devices should be promoted.
7	Maintenance and upkeep of machinery	Possibility of accidents during handling machinery.	Personnel should be well trained and first aid kit should be available.
8	Waste disposal	Open disposal of chemical wastes or cleaned water leads to contamination of surroundings and water bodies.	Wastes should be properly disposed as per the recommendations given in activity specific environment guideline is given in *Annexure 7.*
9	Facilities at processing and manufacturing centres	Lack of required basic amenities will affect health of workers.	The work space should be ventilated to the extent possible. Should have drinking water and toilet facilities.
10	Packaging	Use of un decomposable	Bio degraded able ingredients and

		packaging material further cause the soil pollution.	re-useable packaging should be promoted.
11	Adoption of environment guidelines	Lack of awareness may lead to non adoption of the guidelines	Awareness and training programmes need to be organized for the entrepreneurs and workers.

KRuSHE Marts:

The project will organise rural retail chains by creating a network of KRuSHE Marts that offer branded and non-branded households goods and daily needs at lower cost. The project will aim at transforming traditional Kirana shops and other retail outlets into KRuSHE Mart outlets.

3.1.2.3. Environment Guidelines for Rural Retail Chains: KRuSHE Marts

Environmental impacts here will include ventilation, storage practices, labeling, packing etc.

Table 7: Potential Environmental issues and Environment friendly alternatives for KRuSHE marts include:

S. No	Key aspects in Rural marts	Possible issues	Interventions, Best practices
1	Rural mart structure	Poor ventilation, possibility of moisture seepage etc. will favor the pest and mold growth.	The marts should be well ventilated, moisture proof.
2	Storage of provisions	The large scale storage of provisions attracts pests and offers scope for fast multiplication necessitating the chemical use for pest control which may contaminate the products posing health risks. Contact with moisture will lead to fungal growth, off flavors etc. Consumable items (nutria products) when stored with products of chemical nature may contaminate the product or give unfavorable odors.	The provisions should be stored in air tight packed conditions to the extent possible and should be placed on a cement or wooden platform. Natural precautions like adding neem leaves, spraying the container and floor with neem seed kernel extract etc. should be followed. Consumable items should not be stored with goods of chemical nature such as mosquito coils, pest repellent liquids or tobacco products. The unpacked ready to consume items like nutri products should be stored in clean containers with lids.
3	Product durability, labeling	Out dated products or products that are stored for long time will lead to health issues when consumed.	Each product packed and sold by the KRuSHE mart should have mention of expiry date. Any pest or mold infested or outdated products should be cleared and disposed safely on regular basis.
4	Package material	Use of plastic bags under thickness of 20 microns is not allowed for	Use news paper wrapping or cloth bags for supplying the provision to the

		packaging due to their non recyclable nature and potential negative impact on environment.	consumer. Encourage the consumers to bring cloth bags.
5	Adoption of environment guidelines	Lack of awareness may lead to non adoption of the guidelines.	Awareness and training programmes need to be organized for community and involved stakeholders from the village.
Good Practices: • Flammable items when not stored in required condition may lead to accidents. Flammable items should be stored separately in prescribed conditions.			

The activity specific Environment Guidelines for farm and nonfarm activities under Rural retail chains and are attached as *Annexure 7* along with list of support agencies. These guidelines can be used during development of business plans.

3.2. Component 2- Human Development (HD)

The HD component will build upon the existing government and civil society structures and mechanisms such as, *Maarpu*, IAH, NDCC, etc. It will do so by developing a convergence model that supports the strengthening of existing nutrition, health and pre-school education service delivery facilities at the village level by providing additional financing for gap filling and incentives and awards for performance.

The approach of the project looks at three sub components:

1. Strengthening demand for improved quality service delivery through community participation, and
2. Strengthening supply of key services through improving skills in community engagement, motivation of the FLWs and community monitoring.
3. Linkages with value chains for improved nutritional outcomes

The activities under each sub component and applicability of EMF is presented here under:

Table 8: Applicability of EMF to HD components

S. No	Component	Key activities	Applicability of EMF
1.	Strengthening demand for improved quality nutrition, health and pre-school education service delivery through community participation	Developing village HD plans. Rollout of village HD plans. Capacity building HD teams at village and mandal levels. Awareness programmes for behavioral change on water and sanitation and nutrition aspects.	Integrating Environment guidelines into HD plan preparation and implementation. Integration environmental aspects into creation of safe drinking water and sanitation facilities and maintenance. Importance of environmental sanitation.
2.	Strengthening supply of key nutrition, health and	Strengthening district training teams of line departments.	Integration of module on environment guidelines to be

	pre-school education services through improving skills in community engagement, motivation of the FLWs and community monitoring.	Technical trainings to front line workers.	followed during creation and maintenance of Water and Sanitation facilities and nutrition related interventions.
3.	Linkages with value chains for improved nutritional outcomes	Farmer Field Schools for nutrition sensitive agriculture. Nutri shops and take away food centres. Community kitchens. Sanitation and supply of safe drinking water.	Organic methods of cultivation. Environmental guidelines for infrastructure, cooking and storage. Environment guidelines for drinking water and sanitation.

Village level HD plans:

Village level HD plans will be prepared to indentify the HD issues and gaps in the village. As part of HD plan preparation household surveys as well as village facility surveys will be conducted related to water, sanitation, health, nutrition, education and livelihoods.

It is proposed to adopt a two pronged approach to implement the project in all the 150 mandals across the state:

1. In 100 mandals the entire HD plan will be implemented which includes interventions pertaining to health, nutrition, water and sanitation, pre-school education, gender, ID for PwD, social protection, safety nets and entitlements.
2. In the remaining 50 mandals, the focus will be on piloting few innovations while implementing the HD plans proposed under the prong one.

The provision of guided financing under HD plan development for 1000 villages in the 100 mandals will be made, assuming that the PRI and VO jointly would take the responsibility to plan and achieve the desired HD outcomes deemed appropriate and that they are not running short of resources feeling hapless.

The HD fund based on HD plan can be used for the following based on urgency:

- Nutrition security (1000 days protection, management of SAM and MAM and Adolescent girls and management of communicable diseases)
- **Water safety**
- **Sanitation & Hygiene**
- **Kitchen gardening**
- **Community (common) kitchen**
- **Model health and nutrition hubs – Consumption field schools- Family feeding centers**
- Nutrition counselors
- Health promotion

- Teacher learning material
- Awards for the best performing FLWs

EMF is applicable to the interventions marked in bold.

The HD interventions and environment guidelines for the same are discussed below:

3.2.1. Environment Guidelines for ensuring and monitoring safe drinking water supply:

This activity focuses on addressing gaps in provision of safe drinking water in the villages especially in fluoride affected villages. This would involve working with GPs, mobilization of Village Health Sanitation and Nutrition Committees. This could entail building a cadre of Community Resource Persons facilitating village level micro plans, developing financial products for sanitation services and establishing convergence with NREGS for building community water and sanitation assets.

Table 9: Environment guidelines for Drinking water supply monitoring:

S. No	Component	Possible Issue	Intervention or best practice
1	Source of drinking water	There is possibility of contamination of the surface water source with fecal matter and other organic pollutants, debris etc. Inorganic pollution is also possible through fertilizer runoff, high concentration of fluoride, arsenic, nitrate etc. in cases where ground water is the source.	Water should be testing in the lab facility of RWS with help of Panchayat before arranging for the supply. Water testing should be done by the VOs (sending the samples to RWS laboratory) on regular basis as part of monitoring.
2	Use of ground water	In case if the water source is ground water, over exploitation coupled with lack of recharge may leading drying up of the bore well.	Recharge structures should be planned for all ground water sources with support from department of RWS
3	Supply system	In the piped supply system leakages are possible which leads to contamination with sewage water near drains etc.	The concerned committee in the VO responsible for monitoring should regularly check for any leakages at regular intervals and get the issues solved with help of PRI and the department of Rural Water Supply.
4	Fecal contamination in monsoons	Fecal contamination is possible in monsoon causing diarrhea.	The monitoring committee in the VO should be equipped with H_2S vials for checking water quality at regular intervals.
5	Water storage and handling at household level	Even if water supplied is safe contamination and ill health is possible at household level due to wrong practices in storage and handling water.	Awareness programmes to be planned at village level on practices like boiling water in monsoon, safe storage, handling

			water through ladle, using clean tumblers etc. Practices like household level purification should also be promoted.
6	Deflouridation treatment plants in villages with fluoride contamination.	In villages where deflouridation units are established disposal of sludge may pose and serious environment hazard.	About 80-100 gms of sludge is generated per 1000 liters of water in electrolytic deflouridation units. Feasible options for sludge treatment and disposal are to be explored – such as brick making and sanitary landfills. Dewatering the sludge allows for safe storage for a period of time which can be used for dry land filling.
7	Use and maintenance	The established facilities will not serve the purpose if guidelines on proper use and maintenance are not followed.	Awareness and training programmes need to be organized for community and involved stakeholders from the village.

Fluoride problem and issue of sludge disposal:

Fluoride has beneficial effects on teeth at low concentrations in drinking-water, but excessive exposure to fluoride in drinking-water (above 1.5 mg per litre as per WHO standards), or in combination with exposure to fluoride from other sources, can give rise to a number of adverse effects. These range from mild dental fluorosis to crippling skeletal fluorosis as the level and period of exposure increases. Crippling skeletal fluorosis is a significant cause of morbidity. In Andhra Pradesh 6 districts are endemic to fluorisis. These are - Kadapa, Krishna, Kurnool, Chittoor, Guntur, Nellore.

Discharge of the sludge collected in the treatment plants is an issue of concern as open disposal (which is a normal practice) will lead to leaching into ground water.

- For safe disposal the fluoride should be dewatered using vacuum filters and dried. It can added to the soil used for brick making (to large quantities of soil so that the concentration of fluoride is diluted) or for concrete blocks. The requisite equipment for the same and the guidelines for disposal should be built into the contracts.

3.2.2. Creation of Sanitation facilities:

This activity focuses on leveraging investments made by SERP in the institutional platform of SHGs and VOs to work on mobilization around sanitation, defecation free villages and access to sanitation services in select mandals. This would involve working with GPs, mobilization of Village Health Sanitation and Nutrition Committees. This could entail building a cadre of Community Resource Persons facilitating village level micro plans, developing financial products for sanitation services and establishing convergence with NREGS for building community water and sanitation assets.

Table 10: Environment Guidelines for construction of IHHL:

S. No	Component	Possible Issue	Intervention or best practice
1	Location of the toilet	Toilet location near to the drinking water source has high chances of contaminating the water. Location too far from the house or too near to the house may deter the use.	Safe distance from drinking water sources to be followed. The location of the septic tank should be downhill from the water source depending on feasibility. The safe distance depends on local hydrological conditions, however 30 mts is treated as safe distance[1]. Appropriate location should be selected which will not discourage the use in consultation with the household.
2	Water facility in side toilet	Lack of water facility inside discourages the use and affects cleanliness.	Water facility should be provided inside to the extent possible. 2 pit system toilet with Pan with steep slope 25^0-28^0 and trap with 20 mm water seal as designed by Sulabh International will reduce the usage of water (required 1-1.5 lits for flushing)[2]. In areas with water scarcity water efficient toilets like ecosan toilets can be constructed.
3	Hand wash facility	Practice of not washing hands after toilet use will cause fecal contamination of food and water while handling, eating etc.	Hand wash facility outside the toilet should be made integral part of design or facility of water and soap should be made available outside.
4	Ventilation	Poor ventilation discourages use by children and affects cleanliness and maintenance.	Proper ventilation to be ensured as lack of ventilation or electricity discourages the use
5	Construction models	Cost and availability of space and water is a constraint for toilet construction in many areas.	The following low cost options can be explored based on need: Plinth level toilet with temporary super structure can be constructed which is of low cost. Use of hollow bricks will reduce cost Eco san toilets – in water scarce areas. Biogas linked toilets depending on acceptability.

[1] Septic Tanks, http://www.who.int/water_sanitation_health/hygiene/emergencies/fs3_9.pdf viewed on 28th March 2014.
[2] Two Pit System, viewed at http://www.sulabhinternational.org/content/two-pit-system, on 28th March 2014.

		Anganwadi toilets are not used when not designed specific to child needs.	Child friendly anganwadi toilets with easy access to water tub, provision of opening from inside and outside, small 14 inches pan, water storage at 1 feet ht.
6	Disposal of construction debris	Open disposal of debris near the toilet itself sometimes block the access and acts as hiding place for snakes etc. Debris disposed near drains leads to stagnation obstructing the flow.	The debris should be disposed away from the site preferably though land filling.
7	Use and maintenance	Improper use and maintenance will lead to defunct facilities	Awareness programmes should be organized for community on proper use and maintenance.

3.2.3. Environment Guidelines to be integrated into the awareness programmes facilitating use and proper disposal of Sanitary napkins:

- The sanitary napkins should not be disposed openly into garbage as it poses health hazards. They should but burnt or buried. Burial is recommended as safe practice as burning leads to harmful gases because of plastic. A deep burial pit can be constructed for burial in a common location.
- Providing identifiable disposable bags along with the napkin packs and in village as common disposable point would facilitate hygienic handling of used napkins
- Low cost environment friendly napkins should be explored for promotion in the villages. Reusable cloth sanitary napkin production by SHGs is being explored in Trichy, Tamil Nadu[3].

3.2.4. Environment Guidelines for Nutrition Gardens:

Nutrition gardens at household will be promoted through Farmer Field School (FFS) approach under HD component. To deliver the service at FFS, an Extension Advisory Services (EAS) provider will be positioned in every mandal. Kitchen gardens, livestock, and especially small animals, can play an important role in dietary diversity and in increasing the consumption of micronutrient-rich foods. EAS Provider will help to introduce a diversity of crops, animal husbandry, and fisheries which are available locally, affordable and easily adopted by communities.

[3] Environment Friendly and Low cost Sanitary pads viewed at https://onepercentclub.com/en/#!/projects/environment-friendly-and-low-cost-sanitary-pads/plan on 28th March 2014.
Another link: http://ecofemme.org/about/media/

Table 11: Environment Guidelines for Nutrition Gardens:

S. No	Component	Possible Issue	Intervention or best practice
1	Selection of varieties	Varieties not suitable to local conditions and hybrids may not provide better nutrition but may increase costs for pest and disease management.	Grow locally available good yielding varieties.
2	Pest and disease management	Use of chemicals for nutrient, pest and disease will lead to harmful chemical residues in food and soil, affect local biodiversity.	The kitchen garden should be grown by organic methods only.
3	Water use	Flood method of irrigation need more quantities of water.	Drip method or IDA drip method can be followed to conserve water.

3.2.5. Environment Guidelines for Nutrition Cum Day Care Centers (NDCCs), Community Kitchens, Nutri product preparation:

Supporting communities set up community kitchens and nutrition enterprises in a hub-and-spoke model to prepare and supply nutritious meals to ICDS, Mid-Day Meal, destitute feeding centers, etc. in a healthy and hygienic manner. The same kitchen will also be used to develop nutri-products .These enterprises could be linked to local value chains developed under the project.

The project also aims at transformation of the village *Kirana* stores into a convenient and affordable access point for good quality, safe and nutritious food. This would create a rural retail chain that connects local producers for various food and nutrition products, local branded products and doorstep outlets. These stores would also be linked with organic and pesticide free sustainable agriculture program which supports more than a million organic producers. The project would work on developing a brand of KRuSHE which all these stores would carry.

Table 12: Environment guidelines for NDCCs, Community kitchens and nutri products preparation:

S. No	Component	Possible Issue	Intervention or best practice
1	NDCC or community kitchen facility	Lack of proper ventilation needs more energy for lighting and will not be of convenience for cooking, eating etc.	Well ventilated spaces should be hired or ventilation should be given importance during construction.
2	Raw materials, ingredients used for cooking	Products from chemical farming will have negative impact on health.	Organic products or the products from CMSA should be used to the extent possible. Diversified food products with high nutritive values like millets, greens, egg etc. should be considered for ensuring required nutrition uptake.
3	Storage of cereals	Improper storage of the ingredients	Storage should be in clean, dry

	pulses, oil etc.	leading to contact with moistures, exposure to pests like rats etc. will spoil the quality there by having impact on health.	places with in tightly packed containers or containers with lids, covers. Food products should not be stored along with any products of chemical nature. Outdated raw materials or raw materials stored for long periods should not be used. Raw materials should be inspected at regular intervals and any spoiled materials should be safely discarded.
	Storage pest control	Use of chemicals to control storage pests like cockroaches, rats etc. as they may contaminate the food.	Non chemical pest management methods like neem leaves, dry chillies etc. can be used for storing the raw materials.
4	Cooking practices	Cooking and serving in unclean, not properly washed and dried vessels may lead to contamination of food. Cooking and serving without washing hands may also contaminate the food. Eating food without washing hands will allow bacteria and virus present on hands to contaminate the food.	Cooking should be done in clean and dry vessels. The vessels should be washed properly after cooking and serving and dried in sun. Wearing gloves and hair cap while serving is advisable. Hand wash facilities (soap and water) should be provided at nutrition centre. In case of children it is advisable to taste the food before serving.
5	Storage of cooked food.	Storage of food without covers, lids etc. will attract flies and poses risk of contamination causing health hazards	The cooked food until served or sold should be stored in clean and dry containers that are properly covered with lids.
6	Cooking and washing place	Un clean cooking and washing place will encourage flies and pests.	Cooking pace should be kept clean. No water stagnation should be allowed at washing place. Soak pit should be constructed or waste water should be diverted to plants or nutrition garden if available.
7	Waste disposal	Open disposal of wastes attracts stray dogs, pests and flies and creates un hygienic conditions due to decomposition.	The wastes should be composted in a pit and the compost can later be used for the garden. For liquid waste proper drainage

			facilities with cement canals (preferably closed) should be provided.
8	Indoor air pollution	In places where fuel wood stoves are used the smoke will lead to respiratory and eye problems	Fuel efficient smokeless cook stoves or bio gas can be promoted depending on feasibility.
9	Toilet facility	Lack of toilet facilities at NDCC or community kitchen will cause inconvenience as pregnant mothers and small children attend and also to workers at community kitchen. Surrounding environment may be spoiled due to lack of facilities	Toilet with water facility should be made compulsory at NDCC and community kitchens.

For all the construction related activities under HD component – Kitchens, Toilets, Water supply etc. the guidelines for the construction activities are to be referred given as Annexure 8.

However depending on the scale of constructions coming up during the project period special guidelines and site specific Environment Management Plans (EMPs), system of monitoring should be planned and implemented in consultation with the World Bank.

3.3. Component 4 – TA, ICT and Partnerships:

Objective of TA, ICT is to create and operationalize a state of the art, efficient, effective ICT platform for hosting and enabling the delivery of range of projects – for Human development, Livelihoods and social development - with a focus on delivering last mile services. The key activities to be implemented under partnership include (i) *Solutions Marketplaces, Knowledge Events* (ii) *Financing Public-Private-Community Partnerships:* The project will encourage productive partnerships with public, private and social enterprise sectors to increase the integration of poor in performing and remunerative value chains.

3.3.1. Innovation forum or Solution market places on Green Business opportunities

The objective of this component will be to enhance the environment benefits by organizing an innovation forum or solution market place to address the critical issues identified through environment assessment and that will be identified during the project period. The theme of the innovation forum or solution market place will be – Green Business Opportunities' and the objective will be to identify high impact environment management related innovations on value chains and to form productive partnership with Technical Agencies that can provide support on energy efficient processing, improving water use efficiency, waste utilization and recycling, green labeling and marketing etc.

The innovation forum or solution market place will be organized inviting high impact solutions for the 8 critical environmental issues that are identified during the environment assessment of the value chains which are mentioned below:

Table 13: Critical Environmental Issues indentified in value chains:

S. No	Interventions /Value Chains	Environmental issues to be addressed	Issues planned to be addressed by SERP	Residual issues need to be addressed
1	Paddy Value Chain	Use of chemicals to enhance productivity and to manage pests and diseases will lead to pollution of local environment, enters food chain etc.	Plan for Non Chemical methods for crop management.	Nil
		Use of high quantities of water depletes local water resources	Promotion of System of Rice Intensification (SRI) to conserve water.	Nil
		Waste management issues in the processing, milling is an issue when openly disposed.	Plan for charcoal briquettes.	Can plan for biomass gassifiers and energy produced can be used for running the mill and by product charcoal can still be put to

				suitable use.
2	Red gram	Use of chemicals to enhance productivity and to manage pests and diseases will lead to pollution of local environment, enters food chain etc.	Plan for Non Chemical methods for crop management.	Nil
3	Turmeric	Use of chemicals to enhance productivity and to manage pests and diseases will lead to pollution of local environment, enters food chain etc. Energy and water requirement for boiling depletes local fuel and water resources.	Plan for Non Chemical methods for crop management	Nil Use of steam boilers to conserve water and energy.
4	Cashew Nut	Use of chemicals to enhance productivity and to manage pests and diseases will lead to pollution of local environment, enters food chain etc. Open roasting and rum roasting consume high quantities of energy and have potential health hazards.	Plan for Non Chemical methods for crop management. Not planned.	Steam roaster should be introduced.
5	Coffee	Use of chemicals to enhance productivity and to manage pests and diseases will lead to pollution of local environment, enters food chain etc. Coffee pulper for wet processing needs high quantities of water which may deplete	Plan for Non Chemical methods for crop management.	Nil Modern pulper which use less quantities of water to be used.

		local water resources. Disposal of waste water is an environmental issues due to huge quantities and chemical nature. Open dry processing affects quality and possibilities of contamination are there		The waste water can be used for biogas generation using technology developed by Indian Institute of Science. Solar dries can be used.
6	Pine apple	Use of chemicals to enhance productivity and to manage pests and diseases will lead to pollution of local environment, enters food chain etc. Open drying contaminates the product.	Plan for Non Chemical methods for crop management.	Solar driers can be used.
7	Dairy	Fodder cultivation, breed and vaccinations play key role on animal health. Waste management poses environmental problem when disposed openly which is the common practice.	Plan for fodder cultivation and breed upgradation.	Nil Biogas plants can be planned through CDM project.
8	Fisheries	Waste disposal after processing.	Nil	Manufacture of poultry feed from fish waste or organic manures can be planned.
9	Small scale enterprises	Safety issues for the workers and waste disposal problems.	Not planned.	Measures to be planned after individual activity assessment.

The procedures and standards for announcement, identifying technical support agencies, implementing the high impact solutions etc. will be in line with those that are set for innovation forum or solution market place.

3.3.2. Green tools for rating and certification of green products under value chains:

For rating the greening of value chains, green business opportunities green tools will be developed by a third party certification agency after setting green standards for each product. Software for green rating need to be developed under ICT component. The traceability mechanism for green products will also be developed under ICT. Further details on these are discussed in EMF implementation chapter.

3.3.3. Environment Guidelines for ICT interventions – Use of tablets and e- Waste management.

- The E waste if not disposed properly it may pollute ground water, soil and air. The heavy metals like cadmium, lead etc may leach from the waste and may pollute the ground water. The presence of metals like cadmium, mercury, lead causes air pollution through harmful emissions. According to e-waste (Management and Handling) Rules, 2011that e-waste generated by them is channelized to the authorised collection centre(s), or registered dismantler(s) or recycler(s) or is returned to the pick up or take back service provided by the producers; and Bulk consumers shall maintain record of e-waste generated by them in the Form 2 and make such record available for scrutiny by the State Pollution Control Board or the Pollution Control Committee concerned.
- During the purchase required clauses should be included in the contract conditions to ensure that the producer provides SERP with a list of authorized collection centers/dismantlers/recyclers.

Chapter - IV

4. EMF Implementation Arrangements

The institutional arrangements for EMF and plan of implementation are discussed in this chapter.

4.1. Approach to development of Environment Management Framework (EMF):

EMF is designed in consultation with various stakeholders – the project teams, concerned departments, community representatives through field consultations. Respective thematic teams in SERP are involved in the process of EMF development including Community Managed Sustainable Agriculture (CMSA), Livestock and Poultry Development (LPD), KRuSHE teams. Comments on the draft report are obtained from the World Bank team.

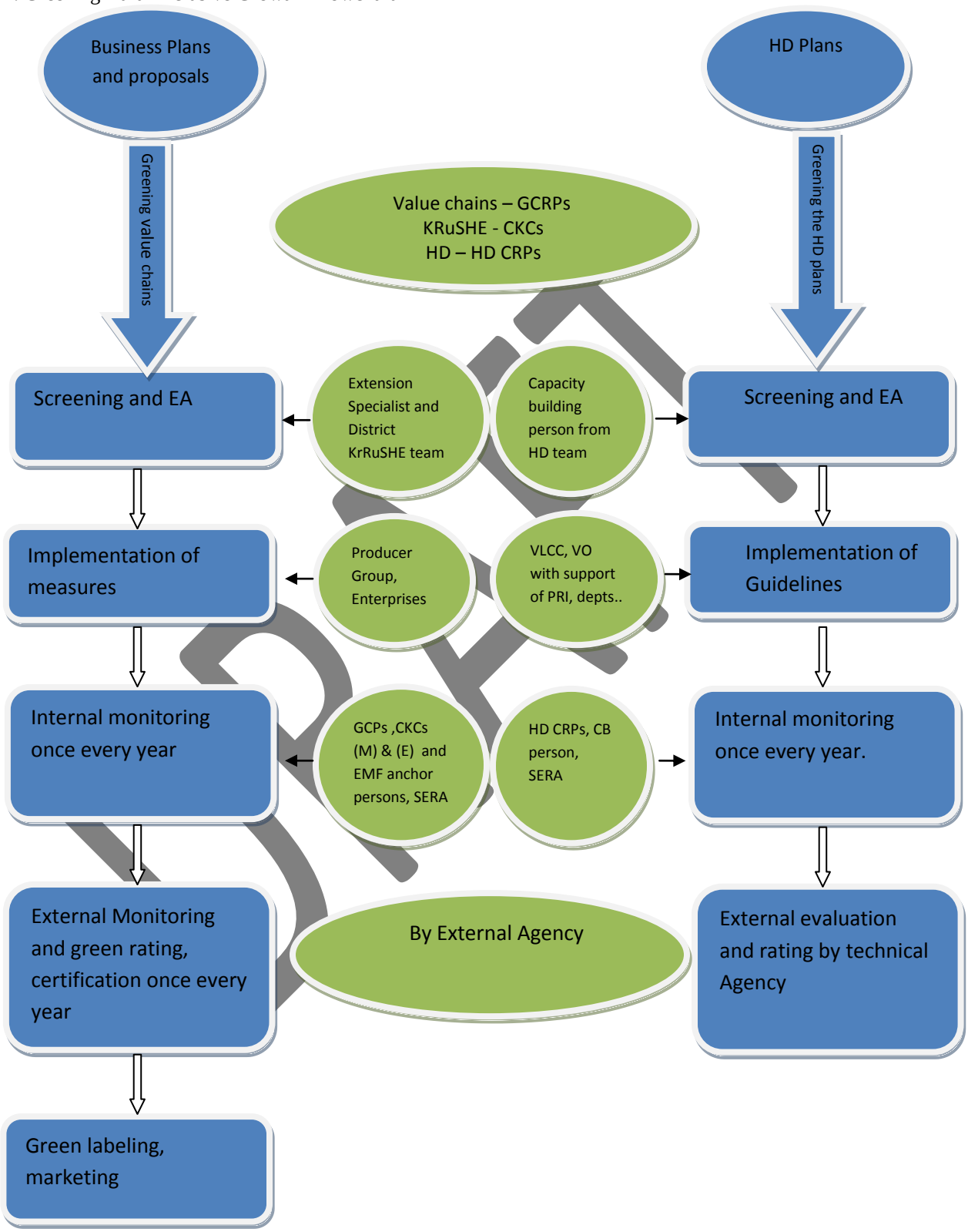
Consultations: Consultations with key stakeholders (Community, NGOs and representatives from government line departments) are held through workshops in 2 locations – Visakhapattanam representing coastal Andhra region on 25th June 2014 and Kurnool representing Rayalseema region on 30th June 2014. The reports and participant details are attached as *Annexure 9.* The EMF is in agreement with the stakeholders and the suggestions by stakeholders are duly integrated into the EMF.

This section details the following aspects of the implementation of the Environmental Management Framework (EMF):

- Greening the business plans (Value chains), business proposals (KRuSHE marts and KRuSHE Enterprises) and HD plans (Village Infrastructure Plans)
- Environment Appraisal for ensuring integration of Environment guidelines into the value chain business plans, KRuSHE Marts & Enterprise proposals and Human Development plans. The following plans will go through the process of Environmental Appraisal
    - Business Plans developed by Producer Groups
    - Business proposals developed by KRuSHE entrepreneurs
    - HD plan under HD component developed by HD teams (HD CRPs)
- Innovation forum on 'Green Business Opportunities'
- Institutional arrangements for implementation of EMF
- Monitoring strategy
- Capacity building plan
- Budget
- Timeline

Greening Rural Inclusive Growth: Greening the plans and Environmental Appraisal

Figure 1: Greening Rural Inclusive Growth - flowchart



4.2. Greening the Business Plans, Business Proposals and HD Plans:

Producer Group 'Business Plans' – Rural Value Chains:
The Producer Group (PG) will be facilitated by the Village Resource Person (VRP) with support of Community Resource Persons (CRPs). The commodity specific Spear Head Teams (SHT) functioning at cluster level (comprising of Producer Group Specialist; Agri Business Specialist; Extension Specialist; Agriculture Nutrition Specialist etc.) provides support to Producer Group in developing the Business Activity Plans on Value chains for the selected commodities at cluster level – Paddy, Red gram, Turmeric, Cashew nut, Coffee, Pine apple, Dairy, Small ruminants, Poultry, Fisheries etc. Environment Guidelines will be integrated into the value chains by Producer Groups with the support of Green Community Resource Persons (GCRPs) under the guidance of Extension Specialist who is the anchor person for EMF at cluster level as part of SHT. The technical agency on the specific commodity will also take part in this process to provide necessary technical inputs.

KRuSHE Marts and Enterprise Business Proposals - Rural Retail Chains:
The KRuSHE Marts will be identified by Community KRuSHE Consultants (CKCs) Marts (M) who will consider environmental conditions (as provided in the Table 7) and integrates environment guidelines into the business proposals with the help of Spear Head Teams and Knowledge partners if required.
Similarly KRuSHE Enterprises will be identified by Community KRuSHE Consultants (CKC) Enterprises (E) integrating into the business proposals, the activity specific environment guidelines provided in *Annexure 7.*

Village Infrastructure Plans - HD Plans:
The village HD plans are prepared by HD Community Resource Persons (CRPs) and Village Level Convergence Committees (VLCC) s involving the PRI. A team of 2 CRPs will cover 5 villages in mandal. The environment guidelines will be integrated by CRPs into HD intervention during the preparation of the plans with the support of Capacity Building person from mandal HD team and Technical Agency.

4.3. Environment Appraisal and Environment Guidelines for greening value chains and HD interventions:

4.3.1. Environment Appraisal of Value chains - Business Plans and Business Proposals

Rural Value Chains – Business plans:
The Business Plans prepared by PGs with help of Spear Head Teams (SHT) will go through the process of Environment Appraisal in order to verify if the compliance requirement and environment guidelines are duly integrated (any compliance requirements and any possible the negative impacts of the activities proposed under value chain and suggestion of appropriate mitigation measures or environment friendly alternatives, any climate change adaptation measures) into the business plan or not.
The responsibility of conducting the environment appraisal of the value chains is with the Extension Specialist who operates at Cluster level as part of SHT. Productivity Enhancement expert, who operates at Supra District level is responsible for any guidance and monitoring the appraisal.

Greening of the Producer Group's Business Plan, which is verified by the process of Environment Appraisal, serves as one of the trigger for release of the fund for Producer Groups.

Rural Retail Chains – Business proposals:
The business proposals for the KRuSHE Marts developed by Community KRuSHE Consultants (CKCs) with help of SHT will be environmentally appraised by Operation Specialist at District Level with support from Knowledge partner.
The business proposals for KRuSHE Enterprises developed by CKC (E) with support from SHT will go through Environmental Appraisal by Enterprise Promoter Operating at District Level. The knowledge partner will offer support in the same.

4.3.2. Environment Appraisal of HD Plans

The HD plans (Village Infrastructure Plans) developed under HD component will go through the process of Environment Appraisal to ensure if the plans have due integration of Environmental Guidelines for the activities – Nutrishops, Community kitchens, Nutrition gardens, Individual Household Latrines (IHHLs) and provision of Safe drinking water.
The responsibility of integration of Environment Guidelines into HD plans lies with the Community Resource Person and the responsibility of Environment Appraisal of HD plans lies with the Capacity Building person trained on EMF operating at cluster or mandal level. The environment guidelines are provided in chapter III and the checklist as *Annexure 8.*

However for all infrastructure and construction related activities depending on the scale site specific Environment Management Plans (EMPs) are to be developed with support from State Environment Expert and Support Agencies identified. This will be done in consultation with World Bank.

4.3.3. Steps in Greening the Producer Group Business plans, KRuSHE proposals HD Plans and Environment Appraisal

Greening of the Business plans involves three steps
1. Screening
2. Integrating Environment guidelines into the plans of value chains, KRuSHE & enterprises and HD Plans
3. Implementation of sustainability measures or environment friendly alternatives.

Screening:
Screening is done to ensure that no activity on the environmental negative list is taken up as part of the interventions. It should also assess the activities being proposed and ensure that the mitigatory measures provided in the EMF meet the requirements. The Legal and Regulatory Framework and the Do's and Don'ts list (or negative list) will assist in screening. The negative list of activities is attached as *Annexure 2.*

Integration of Environment Guidelines into PG Business plans and HD plans:
Greening of the business plans, business proposals and HD plans is done by referring to the commodity or sector wise Environmental Guidelines for identifying the potential issues and mitigation measures (or sustainability measures) and environment friendly alternatives. The identified mitigation measures and

environment friendly alternatives are integrated into the respective plans and proposals along with additional costs if any. All the relevant guidelines to aid in this exercise (list of negative activities, guidelines,) are provided in *Annexure 2, 6 and 7*. Any technical support for implementation of mitigation measures (training, convergence with main stream programmes etc.) will be provided by the Sector or commodity specific Support Organizations – technical agency/knowledge partner and the concerned thematic units in SERP.

Environmental Appraisal

Environmental Appraisal is the process of verifying whether the environment guidelines specified are duly integrated into the business plans of PGs by GCRPs, into KRuSHE business Proposals by CKCs (E) & (M) and into HD plans by HD teams – VIPs. An appraisal format will be provided to aid in this. The format is attached as *Annexure 10.*

Environment Appraisal acts as one of the trigger for release of funds for the plans.

Table 14: Responsibilities at different levels in integrating environment guidelines into business plans, proposals and HD plans and Environment Appraisal:

Task	**Level 1**	**Level 2**	**Level 3**	**Level 4**
Greening the Business plans, proposals and HD plans				
Producer Group Business Plans – Rural Value Chains	The Producer Group (PG) will be facilitated by the Village Resource Person (VRP) with support of Community Resource Persons (CRPs).	The commodity specific Spear Head Teams (SHT) functioning at cluster level provides support to Producer Group in developing the Business Activity Plans on Value chains for the selected commodities.	Environment Guidelines will be integrated into the value chains by Producer Groups with the support of Green Community Resource Persons (GCRPs) under the guidance of Extension Specialist (who is the anchor person for EMF at cluster level as part of SHT).	The technical agency on the specific commodity will also take part in this process to provide necessary technical inputs.
Rural retails chains – Business proposals	The KRuSHE Marts will be identified by Community KRuSHE Consultants (CKCs) Marts (M) who will consider environmental conditions (as provided in the Table 7) and integrates	Spear Head Teams and Knowledge partners will support in integration of the environment guidelines.	-	-

	environment guidelines into the business proposals. KRuSHE Enterprises will be identified by Community KRuSHE Consultants (CKC) Enterprises (E) integrating into the business proposals, the activity specific environment guidelines provided in *Annexure 7.*	Spear Head Teams and Knowledge partners will support in integration of the environment guidelines.	-	-
Human Development plans	The village HD plans are prepared by HD Community Resource Persons (CRPs) and Village Level Convergence Committees (VLCC) s involving the PRI. A team of 2 CRPs will cover 5 villages in mandal. The environment guidelines are integrated by CRPs into HD plans.	The Capacity Building person from mandal HD team and Technical Agency will support in integration of environment guidelines.	-	-
Environmental Appraisal				
Rural chains – Business plans	The Business Plans will go through the process of Environment Appraisal by	Productivity Enhancement expert, who operates at Supra District level is responsible for any	Environment Appraisal, serves as one of the trigger for release of the fund for Producer Groups.	State environment expert and Technical Agency offers any required guidance on appraisal process.

	'Extension Specialist' who operates at Cluster level as part of SHT.	guidance and monitoring the appraisal.		
Retail chains – Business proposals	The business proposals will be environmentally appraised by Operation Specialist at District Level with support from Knowledge partner. The business proposals for KRuSHE Enterprises will go through Environmental Appraisal by Enterprise Promoter Operating at District Level. The knowledge partner will offer support in the same.	-	-	State environment expert and Technical Agency offers any required guidance on appraisal process. State environment expert and Technical Agency offers any required guidance on appraisal process.
HD plans	The HD plans will go through the process of Environment Appraisal by the Capacity Building person operating at cluster or mandal level.	Technical Agency provides any required support.	-	-

4.3.4. Innovation forum or solution market place on Green Business Opportunities:

Innovation forum on the 8 critical issues identified (Table: 13) will be conducted within 6 months after the project inception as per the norms and standards decided under the project. The State Environment Expert has the responsibility of organizing the innovation forum. The selected Technical Agencies will provide technical guidance and hand holding support to the PGs in integrating Green Business Opportunities into the value chains. Based on the new issues that may emerge a second innovation forum can be conducted after 2nd year of the project inception (eg: integration of climate change adaptation into value chain activities). The inputs for ToR for the Technical Agencies is attached in *Annexure 11.*

4.3.5. Green Audits and Third party certification for accessing premiums:

As the business activity plans, business proposals and HD plans will start integrating environment guidelines and green business opportunities as part on innovation forum, the environmental benefits accrued will be measured with the help of green rating tools which will be developed under ICT component. Initially during year 1, the standards / criteria will be set by a technical agency. Green tools will be developed based on the criteria by the agency which will be used by the GCRPs, HD CRPs and CKCs and Extension Specialists, KRuSHE district teams and HD Capacity building person to rate the value chains and HD plans at every crop season or at half yearly intervals for HD plans. The State Environment Resource Agency will also conduct green audits once every year using the green rating tools.

For the plans where the implementation of measures and guidelines is up to the desired level green rewards will be presented. The third party agency will certify the products from the value chains and provides endorsement which may help in accessing the premiums in market through green labeling. The authenticity of the product will be ensured through traceability mechanism which will be worked out with the help of third party technical agency. The third party certification will happen through green audits from year 2 or 3 onwards, once every year. The ToR for the technical Agency is attached in *Annexure 11.*

4.4. Institutional Arrangements for Implementation of EMF:

The following cadres will be responsible for implementing EMF at various levels with specified roles and responsibilities:

Figure 2: Institutional arrangements for EMF implementation

4.4.1. At State level:

State Environment Expert in Project Management Unit (PMU) will have the overall responsibility for implementation of EMF. A State Environment Resource Agency (SERA) will be hired for support in Capacity Building and Internal monitoring (green audits). The ToRs for State Environment Expert and SERA are attached as *Annexure 11*.

4.4.2. At Supra district level:

For Value chains - Productivity Enhancement Expert positioned at Supra district level will have the responsibility of ensuring EMF implementation: Environment Appraisal of business plans and implementation Green business opportunities at respective district levels, Capacity Building cluster teams and monitoring.

For retail Chains – for KRuSHE Marts, Operations Specialist at District level and for KRuSHE Enterprises, Enterprise Promoter at district level are responsible for EMF implementation: Environmental Appraisal of Business Proposals, capacity building cluster teams and monitoring.

4.4.3. At Cluster Level or Mandal level:

Extension Specialist (ES) from the SHT has the responsibility of ensuring greening of all value chains by Green Community Resource Persons (GCRPs) and conducting environmental appraisal (and

providing support in implementation of mitigation measures. The ES has the responsibility of capacity building and monitoring GCRPs.
For KRuSHE proposals the CKCs (M&E) has the responsibility of greening the proposals or integrating environment guidelines. Environmental appraisal for K marts is done by Operation specialist and K Enterprises by Enterprise promoter.
In case of HD plans HD CRPs will integrate environment guidelines and the Capacity Building person from HD team will have the responsibility environmental appraisal of HD plans.

4.4.4. Technical support agencies:

Value chains - Technical Agencies (TAs) selected through innovation forum will have the responsibility of providing required technical support in implementation of Green Business Opportunities or eco friendly alternatives on critical issues identified. Technical agencies will also be hired for setting standards for green rating and certification through audits.
KRuSHE Marts and Enterprises – TAs will have the responsibility of providing necessary support on environment guidelines.
HD component – TAs will have the responsibility of integrating EMF aspects into implementation plans.
The inputs for ToR for Techncial Agencies is attached as *Annexure 11.*

4.4.5. Village Producer Group (VPG) Level:

The GCRPs, CKCs and HD CRPs has the responsibility of integrating environment guidelines into the business plans by producer groups (greening the value chains) and KRuSHE Marts and Enterprises using the environment guidelines and integrating environment guidelines into HD plans.

Table 15: EMF responsibilities at various levels

Responsible person/agency/group	**EMF activities**
VPG level	
Green Community Resource Persons (GCRPs)	Greening the value chains (rural value chains and rural retail chains). Internal monitoring and village level.
HD CRPs	Plans or integrating environment guidelines into HD plans. Internal monitoring and village level.
Community KRuSHE Consultants (CKCs) – M, E	Integrating Environment Guidelines into business proposals. Internal monitoring and village level.
Value chains - Extension Specialist in the SHT	Facilitating greening the value chains. Conducting Environmental Appraisal of the value chains and ensuring implementation of Environment Guidelines.
HD - Capacity building person at mandal level	Facilitating integration of Environment Guidelines into HD plans (VIP). Conducting Environment appraisal of VIP. Ensuring implementation of environment guidelines.
Cluster Level	
Rural Value Chains	Overall responsibility of ensuring EMF implementation at cluster level.

Extension Specialist	Facilitating Capacity Building Programmes on EMF for GCRPs at cluster level and for Producer Groups at village level. Monitoring of EMF implementation in the cluster and feed back to the PMU at State level.
Rural retails chains (KRuSHE) – Spear Head Teams	Overall responsibility of ensuring EMF implementation at cluster level. Facilitating Capacity Building Programmes on EMF for CKCs at mandal level and for entrepreneurs at village level. Monitoring of EMF implementation in the cluster and feed back to the PMU at district and state levels.
HD - Capacity building person at mandal level	Overall responsibility of ensuring EMF implementation at cluster level. Facilitating Capacity building programmes on EMF for CRPs and Village organizations (VOs), VLCCs etc. Monitoring of EMF implementation at cluster level and feed back to PMU.
Supra district level or district level	
Productivity Enhancement expert	Overall responsibility of implementation of EMF in Rural Chains at respective district levels. Facilitating capacity building programmes for Extension Specialists at district or supra district level. Monitoring at district level and feed back to PMU.
KRuSHE Marts - Operations Specialist	Overall responsibility of implementation of EMF in K marts at respective district levels. Facilitating capacity building programmes for SHTs and CKCs Monitoring at district level and feed back to PMU.
KRuSHE Enterprises – Enterprise Promoter	Overall responsibility of implementation of EMF in K Enterprises at respective district levels. Facilitating capacity building programmes for SHTs and CKCs Monitoring at district level and feed back to PMU.
HD – Technical Agency	Overall responsibility of implementation of EMF in HD component at respective district levels. Integrating EMF into capacity building programmes for Capacity building person operating and mandal level at district or supra district level. Monitoring at district level and feed back to PMU.
State Level	
State Environment Expert	Overall responsibility of integration of EMF into Value chains and HD components Organizing Capacity Building Programmes for Cluster level and supra district level teams. Monitoring the EMF Implementation across the state.

	Ensuring EMF related data management, consolidation and documentation.
State Environment Resource Agency	Facilitating EMF implementation. Developing EMF operational manual. Developing IEC material Conducting Capacity Building Programmes at State level, Supra district level and Cluster levels as per the CB plan. Monitoring the EMF implementation as per internal Monitoring Plan (yearly internal audits).
Technical Agencies and Knowledge Partners.	Technical support and linkages for implementation of Sustainability measures, environment friendly alternatives. Works in coordination with State Environment Expert and State Environment Resource Agency and district, mandal level teams.

4.5. Monitoring Strategy:

Monitoring of EMF implementation will be done at two levels, internal and external.

4.5.1. Internal monitoring (green audits):

During the implementation, the activities will be monitored for integration of mitigation (sustainability) measures or environment guidelines into business plans (rural value chains), business proposals (KRuSHE marts and enterprises) and HD plans. The monitoring will also focus on the systems and the capacities at all levels in the PMU for EMF implementation.

Monitoring of EMF will be done by CRPs and CKCs at PG or village level (100% sample) respective cluster teams at Cluster level (sample of 25 each per commodity, K Marts &E and HD component,) and District teams at District level (12 -15 per commodity, K Marts &E and HD plans sample) and State Environment Resource Agency at State Level (sample of 5 for 10 commodities, and 10 HD plans) and State Environment Expert at State level (sample of sample of 5 for 10 commodities, 10 K Marts &E and 10 HD plans). The monitoring will be done once every year. The internal monitoring will involve desk review of plans, field visits to producer groups and use of green rating tools for the activities visited. The sample size can vary depending on total numbers and need at that point of time.

Table 16: Monitoring sample and staff responsible:

Monitoring aspect	**Level of monitoring**	**Sample (number of activities or groups, VOs under different components)**	**Staff responsible**
Greening of Business plans, proposals and integration of environment guidelines into HD plans. Capacity Building for	Village level Cluster or mandal level	100% 25	Green CRPs, CKCs and HD Extension Specialist for value chains, Operations Specialist for K Marts and Enterprise promoter for K Enterprises CB person for HD plans.

project teams.	District level State level	12-15 10	Productivity enhancement expert at relevant district level and for value chains and Technical Agency for HD plans. State Environment Resource Agency State Environment Expert
Implementation of Measures and Environment guidelines in value chains, KRuSHE marts and Enterprises and HD plans – Measured through Green rating tools.	Village level Cluster level District level State level	100% 25 12-15 10	Green CRPs, CKCs and HD CRPs Extension Specialist for rural chains, district team for retail chains and CB person for HD plans. Productivity enhancement expert at relevant district level for rural chains, district team for retail chains and Technical agency for HD plans. State Environment Resource Agency State Environment Expert

4.5.2. External monitoring

For Value Chains: External audits will be conducted by hiring a third party external agency once every year from year 2 or 3 onwards.
The methodology can be a combination of desk reviews (to check the management aspects) and extensive field visits (to check on technical aspects) and stakeholder interactions. Desk review of Business Plans and KRuSHE proposals will be conducted for 20 % of the PGs and VOs.
Green rating will be done after every audit against a pre set criteria developed by third party agency during year 1. A sample of 10% of PGs of all commodities or sectors will be field visited as part of the external audit. The external audit will follow by certification of the products and setting up traceability mechanism for marketing as green products. The sample number can vary depending on total number of activities and the need.

For HD plans: External audits will be conducted by hiring an external agency along with value chains. The methodology involves desk review of HD plans and field visits to a sample (as decided by State environment Exert based on number at that time) of HD plans for verifying integration of environment guidelines. The staffing, Capacity Building aspects will also be evaluated.

The key aspects that will be monitored and the monitoring indicators are given below:

Table 17: Key aspects to be monitored and monitoring indicators:

Key Aspects to be monitored	**Monitoring Indicators**
Value chains	

Compliance of project activities with Legal and Regulatory Framework	Percentage of activities in compliance with legal and regulatory framework
Implementation of Environment guidelines.	Number of PGs, KRuSHE Marts and KRuSHE Enterprises implementing Environment guidelines and rating as per green rating tool.
Implementation of Environment friendly alternatives or Green Business Opportunities	Number of PGs implementing Environment friendly alternatives or Green Business Opportunities
Green rating of the value chains	Percentage of value chains qualify under green rating.
Internal Monitoring	System and frequency of internal monitoring (green audits)
Capacity Building of CRPs, CKCs and project staff at different levels	The percentage of CRPs, CKCs and project staff at different levels (with EMF roles) underwent Capacity Building programmes.
HD Plans	
Integration of environment guidelines into HD plans Environment Appraisal of HD Plans	Percentage of HD Plans that have environment guidelines integrated Percentage of HD plans underwent EA
Implementation of Environment Guidelines	Percentage of VIPs or HD plans with environment guidelines integrated.
Capacity Building of CRPs and project staff at different levels	The percentage of CRPs and project staff (CB person at mandal level) underwent Capacity Building programmes.

4.6. Capacity Building Plan:

Capacity building is required for the Project functionaries (VRP, Extension Specialist and Productivity Enhancement Expert, Operation Specialist and Enterprise promoter under KRuSHE), Green Community Resource Persons (GCRPs), HD CRPs, CKCs and Support Organisations or Techncial Agencies or Knowledge Partners to execute the functions pertaining to the EMF in an efficient manner. The capacity building programmes will be conducted on regular basis both through integrating into the general induction training programmes (for all the staff under the project) as well as through focused training for relevant staff and project functionaries on the EMF.

4.6.1. Identification of Resource Agency:

Resource Agency will be hired at the State level for conducting the capacity building programmes for project functionaries. Field level presence, working experience with community or SHGs, technical expertise will be considered while selecting the agencies. The responsibility of the Resource Agency includes:

- Designing the Capacity Building modules (for project functionaries and CRPs, CKCs) and conducting the training programmes for project functionaries at state and district levels (which include cluster level staff as well). Support organizations or Technical Agencies or Knowledge Partners will also be part of district level trainings.
- Development of IEC materials for the project functionaries and for CRPs, CKCs.

4.6.2. The Capacity Building Curriculum

The Capacity Building curriculum should include the following (the design and delivery of the modules will be according to the needs of target groups – Project functionaries and CRP, CKC and PGs.):

EMF aspects:

- Environmental issues in the context of livelihoods, health and sanitation
- Purpose and components of EMF for the APRIGP
- Greening rural value chains, retail chains and integrating guidelines into HD plans.
- Environmental Appraisal process – screening, environmental appraisal
- Implementation of environmental guidelines
- Green ratings – standards and tools and green certification
- Innovation forum and Green Business Opportunities
- Institutional arrangements for EMF
- Key aspects for monitoring of EMF in the APRIGP

Thematic aspects:

- Agriculture: importance of Sustainable Agriculture, commodity wise environmental interventions required in the value chain process.
- Livestock: breed selection, fodder management, manure management, environmental interventions required in dairy value chain.
- Climate Change Adaptation: Impact of climate variabilities on crops and livestock, importance of adaptation measures etc.
- KRuSHE: environment aspects in identified farm and nonfarm enterprises and environmental interventions required in KRuSHE Marts.
- Environment guidelines for community kitchens and nutri shops, nutrition gardens, safe drinking water and sanitation interventions proposed.
- Energy: use of renewable energy and fuel efficient devices in processing.
- Infrastructure: environmental issues concerning location, construction and waste disposal. Guidelines for custom hiring centres.
- Green standards and ratings under each theme.

IEC material:

The following IEC materials will be developed by the appointed State Environment Resource Agency.

- A manual on Environment Management Framework outlining the process, and tools
- Booklets on value chains for all commodities – Agriculture, Dairy and KRuSHE enterprises and marts.
- Posters and calendars on environmental guidelines for various commodities (commodity wise posters)
- Posters and calendars on sustainable dairy management
- Posters and calendars in environmental aspects in farm and nonfarm enterprises, KRuSHE Marts
- Posters and calendars on Water and Sanitation, Nutrtion gardens, Community kitchens, Nutri shops.
- Videos of good practices – to be shown during PG meetings by GCRPs and in CRP trainings.

4.6.3. Capacity Building Plan

The Capacity Building Plan is given below:

State level:
A state level orientation will be organized for PMU staff and support organizations (Technical agencies, knowledge partners) on EMF. This will cover the purpose of the EMF, components, and procedures for environmental assessment, monitoring, capacity building and institutional arrangements. The state level Environment Expert is responsible for conducting the training programme. EMF will also be integrated into progress review meetings and other training or orientation programmes as per the requirement. Refresher programmes will be organized once every year.

A state level training for Productivity Enhancement Experts functioning at Supra district levels will be organized once every year by the State Environment Resource Agency in coordination with State Environment Expert.

A state level training for district KRuSHE teams (Operation Specialist and Enterprise promoter) will be organized once every year by State Environment Resource Agency in coordination with State Environment Expert.

District Level:
Value chains - 2-3 day district level training will be organized for the Extension Specialists on EMF, components, procedures for environmental assessment, monitoring, capacity building and institutional arrangements – with specific to rural value chains. Intensive trainings will be organized on relevant commodities with support of State Environment Resource Agency and respective Commodity Support Organisations. The Productivity Enhancement Expert with support of the State environment Expert is responsible for organizing these trainings with support from district project management. Refresher trainings will be organized once every year.

KRuSHE – district level trainings will be organized for the SHTs of KRuSHE by district team (operation specialist of K marts and Enterprise Promoters of K Enterprises) on EMF aspects with support of SERA.

HD – The Capacity Building persons working at mandal levels will be trained at district level or Supra district level by the State Environment Resource Agency. Technical Agencies hired under HD component will be involved in this.

Cluster Level:
2 day cluster level trainings will organized for Green Community Resource Persons (at district level depending on the number of GCRPs) on the respective sector or commodity. Refresher trainings are organised once every 6 months. The training for GCRPs are organized by Extension Specialist with support of Commodity Support Organisation and other institutes like KVKs, NGOs etc. Refresher trainings will be organized once every year.
Training for CKCs is organized by district teams and knowledge partners at district level with support from State Environment Resource Agency. This is organized once every year.

For HD CRPs cluster level trainings are organized once every year. The trainings are organized by the Capacity Building Person at mandal level with support from Technical Agency.

Village Level:

1-2 day training will be organized for the members of Producer Group at village level by GCRPs with support from Extension Specialist. Exposure visits to the Best practitioner farms and enterprises is part of this. Refresher trainings will be organized once every year.

1-2 day trainings are organized for KRuSHE entrepreneurs by CKCs at cluster or mandal level on EMF.

1 day trainings are organized by HD CRPs to the VLCC and VOs on EMF aspects of HD component once every year. CB person will provide support for this.

Knowledge exchange for GCRPs will be facilitated between villages and cluster through exposure visits etc. The exchange between states will also be facilitated, which will be theme based.

4.7. Time Line

The following is the key time line proposed for the key activities under EMF.

Table 18: APRIGP EMF Implementation Time line:

S. No	Task	Responsibility	Year 1		Year 2		Year 3		Year 4		Year 5	
			0-6	6-12	0-6	6-12	0-6	6-12	0-6	6-12	0-6	6-12
1	Hiring State Environment Resource Agency (SERA)	State PMU										
2	Developing EMF manual and EA tools (including local versions)	SERA										
3	Developing IEC Materials and Training modules	SERA										
4	State level orientation programme – for PMU staff	SERA										
4.a.	State level orientations (refresher programmes)	SERA with support from State Environment Expert.										
5	State level orientation for Productivity enhancement experts											
5.a.	Refresher training for Productivity enhancement experts											

6	District level trainings for cluster teams	State PMU (Environment expert with support from SERA, Support organizations)										
6.a.	Refresher trainings for cluster teams at district level	do										
7	Training programmes for Green Community Resource Persons (GCRPs), HD CRPs, CKCs	Value chains - Extension Specialist KRuSHE - District teams HD - CB person and TA, and SERA supervision										
7.a.	Refresher trainings for GCRPs, CKCs, HD CRPs	do										
8	Training Programmes for Producer Groups, KRuSHE Enterprenuers, VLCCs, VOs	Community professionals (GCRPs, CKCs, HD CRPs) with support of Cluster level teams and Knowledge partners, TAs										
8.a.	Refresher trainings for Prodcuer Groups											

	KRuSHE Enterprenuers, VLCCs, VOs											
9	Innovation forum on Green Business Opportunities (GBOs) and hiring technical agencies for support on critical issues through implementation of GBOs											
10	Setting up green standards for value chain products with help of third party agency and developing green rating tools with support from ICT unit.											
11	Internal Monitoring (green audits using green rating tools)	State Environment Expert, SERA, Project staff CRPs, and CKCs (independently, specified sample).										
12	External Monitoring followed by endorsement and setting traceability											

	mechanism											
13	Documentation, final report											

4.8. Budget Estimate (tentative):

The overall budget for EMF implementation is estimated to be Rs. 4, 74, 80,000 (rupees four crore seventy four lakh eighty thousand only). The breakup is provided in the table below:

Table 19: Budget requirements for implementation of EMF

Head	**Unit cost (Rs.)**	**Total Cost**
Staff at State and Clusters 1 State Environment. 1 Productivity Enhancement Expert at Supra district level. Extension Specialist at Cluster level.	Rs. 40,000 per month for a period of 50 months. (yearly hike as per SERP norms in lumpsum for 5 yrs)	25,00,000 2,50,000 Integrated into overall project staffing costs.
Costs of State Environment Resource Agency		
Staff costs I Team leader (part time) 2 Team members (full time)	 Rs. 30,000 per month for a period of 36 months. Rs. 20,000 per month for a period of 54 months for 2 persons.	 10,80,000 21,60,000
IEC material development (manual on environmental assessment, booklets, posters, video documentation of best practices etc.)	Lumpsum (including printing).	20,00,000
State level orientation for PMU staff and yearly refresher programmes	Logistics by PMU (material costs etc. by SERA). Rs. 10,000 per orientation for 5 programmes.	50,000
State level training for Productivity enhancement experts KRuSHE teams (district level)	50,000 per programme for 5 programmes. 50,000 per programme for 5 programmes	2, 50,000 2,50,000
Training of at extension specialists at district or cluster levels for Cluster teams HD mandal level staff (supra district level)	Rs. 20,000 per district for 13 districts (logistics by the project management). *(logistics by the project management at district or cluster level)* Rs. 25,000 per batch for 3 batches - for WASH persons from 150 mandals.	2,60,000 75,000
Refresher trainings at district or cluster level	Rs. 15,000 per district for 13 districts for 3 rounds (3 years) *(logistics by the project management)*	5,85,000
Internal monitoring	Rs. 10,000 per district per monitoring visit for 13 districts for 4 rounds of	5,20,000

	monitoring visits	
Administration, reporting, documentation and other miscellaneous charges	Lumpsum	10,00,000
External agency costs (technical agencies)		
Technical agency for setting up green standards for products and developing green tools	Lumpsum	50,00,000
Technical agencies for green business opportunities (on 8 environmental issues)	Lump sum (approximate) Rs. 25,00,000 per agency for 8 agencies (approximate)	2,00,00,000
External monitoring		
Costs of External Monitoring and certification by third party agency	Rs. 25,00,000 per monitoring for 4 monitoring studies.	1,00,00,000
Other costs		
Other costs of GCRP and VPG Trainings and monitoring by Project teams (internal audits by GCRPs, Cluster and district teams).	To be integrated into the project implementation costs.	
Software development for Green rating tools and traceability mechanism, purchase of tablets etc.	To be integrated under ICT component.	
Costs on the infrastructure (energy and water efficient equipment for processing)	To be integrated into value chain costs or PG fund.	
Total		**4,59,80,000**
Contingency		**15,00,000**
Total		**4,74,80,000**

Annexures

Annexure 1

List of APRIGP mandals:

S. No.	Andhra Pradesh	
	District	**Mandal**
1.	**Anantapur**	Brahmasamudram
2.		Gooty
3.		Gudibanda
4.		Gummagatta
5.		Kambadur
6.		Mudigubba
7.		Nallamada
8.		Singanamala
9.		Somandepalle
10.		Tanakal
11.		Uravakonda
12.		Vajrakarur
13.	**Chittoor**	B Kothakota
14.		Baireddi palle
15.		Bangarupalem
16.		Chinnagottigallu
17.		Chowdepalle
18.		Kambhamvaripalle

19.		Mulakalacheruvu
20.		Peddamandyam
21.		Peddathippasamudram
22.		Thamballapalle
23.		Thavanampalle
24.		Yerravaripalem
25.	**East Godavari**	Addateegala
26.		Devipatnam
27.		Gangavaram
28.		Katrenikona
29.		Kotananduru
30.		Maredumilli
31.		Rajavommangi
32.		Rampachodavaram
33.		Rowthulapudi
34.		Y Ramavaram
35.	**Guntur**	Achampeta
36.		Amaravathi
37.		Amruthalur
38.		Bellamkonda
39.		Bollapalle
40.		Durgi
41.		Edlapadu
42.		Macherla

43.		Pedanandipadu
44.		Veldurthi
45.	**Kadapa**	Chakrayapet
46.		Chitvel
47.		Galiveedu
48.		Kondapuram
49.		Mylavaram
50.		Peddamudium
51.		Rajupalem
52.		Sambepalle
53.		Veeraballe
54.		Yerraguntla
55.	**Krishna**	A Konduru
56.		Chandarlapadu
57.		Gampalagudem
58.		Kanchika Cherla
59.		Reddigudem
60.		Vatsavai
61.		Veerullapadu
62.		Vissannapet
63.	**Kurnool**	Alur
64.		Aspari
65.		Bethamcherla
66.		Devanakonda

67.		Gudur
68.		Holagunda
69.		Jupadu Bungalow
70.		Kolimigundla
71.		Kosigi
72.		Kothapalle
73.		Kowthalam
74.		Krishnagiri
75.		Nandavaram
76.		Pedda Kadubur
77.		Srisailam
78.		Tuggali
79.		Veldurthi
80.	**Nellore**	Balayapalle
81.		Chejerla
82.		Dakkili
83.		Duttalur
84.		Kaluvoya
85.		Kondapuram
86.		Marripadu
87.		Ojili
88.		Rapur
89.		Sydapuram
90.		Vakadu

91.		Ballikuruva
92.		Donakonda
93.		Dornala
94.		Gudluru
95.		Hanumanthunipadu
96.		Kanigiri
97.		Konakanamitla
98.	**Prakasam**	Maddipadu
99.		Naguluppalapadu
100.		Pullalacheruvu
101.		Tangutur
102.		Veligandla
103.		Voletivaripalem
104.		Yerragondapalem
105.		Zarugumilli
106.		Bhamini
107.		Hiramandalam
108.		Kaviti
109.		Kothuru
110.	**Srikakulam**	Mandasa
111.		Meliaputti
112.		Pathapatnam
113.		Seethampeta
114.		Vajrapukothuru

115.		Vangara
116.		Veeraghattam
117.	**Visakhapatnam**	Ananthagiri
118.		Araku Valley
119.		Chintapalle
120.		Dumbriguda
121.		Gangaraju Madugula
122.		Golugonda
123.		Gudem Kothaveedhi
124.		Hukumpeta
125.		Koyyuru
126.		Madugula
127.		Munchingiputtu
128.		Nathavaram
129.		Paderu
130.		Pedabayalu
131.	**Vizianagaram**	Dattirajeru
132.		Gummalakshmipuram
133.		Jiyyamma Valasa
134.		Komarada
135.		Kurupam
136.		Makkuva
137.		Merakamudidam
138.		Pachipenta

139.		Parvathipuram
140.		Ramabhadrapuram
141.		Salur
142.		Therlam
143.	**West Godavari**	Buttayagudem
144.		Chintalapudi
145.		Dwaraka Tirumala
146.		Gopalapuram
147.		Jeelugumilli
148.		Penugonda
149.		Polavaram
150.		Thallapudi

Coverage of mandals in AP

S. No.	District	No. of Mandals	Total Mandals	% Covered
1	Anantapur	12	63	19.0
2	Chittoor	12	66	18.2
3	East Godavari	10	58	17.2
4	Guntur	10	57	17.5
5	Kadapa	10	50	20.0
6	Krishna	8	49	16.3
7	Kurnool	17	54	31.5
8	Nellore	11	46	23.9
9	Prakasam	15	56	26.8
10	Srikakulam	11	38	28.9
11	Visakhapatnam	14	39	35.9
12	Vizianagaram	12	34	35.3
13	West Godavari	8	46	17.4
Total		**150**	**656**	

Annexure 2

Negative list of activities that cannot be carried as part of Activities under APRIGP:

The activities listed below should not be taken as part of APRIGP as they would contravene the laws and regulations of the State Government, Government of India as well as Safeguard Polices of the World Bank. Such activities should not be supported under the APRIGP. The list provided below should serve as checklist while approving the value chains proposed by producer groups, federations.

Agriculture:

- Digging of irrigation tube well without taking required permission from the relevant authority at mandal level will not be supported
- Digging of tube well (except for public drinking purpose) in an area identified as an 'over-exploited groundwater basin' will not be supported.
- Digging of irrigation tube well within a distance of 250 meters from the nearest tube well will not be supported.
- Digging of tube well within 250 meters distance of a drinking water source cannot be done without permission from authority. And the well cannot be used with a power driven pump, without permission from APTRANSCO.
- Purchase, stock, sale, distribution or exhibition of the following pesticides will not be supported:
    - pesticides classified in Class Ia, Ib and II of WHO classification;
    - pesticides banned by the Government of India;
    - pesticides banned by the State Government
- Purchase, stock, sale, distribution or exhibition of pesticides and chemical fertilizers will not be supported without the requisite licenses.

Food processing and Small Scale cottage industries:

- Activities involving discharge into any water body any industrial waste, sewerage or other polluting substance will not be supported.
- Any industrial activity (related to food processing or cottage industries) will not be supported without requisite permission from the State Pollution Control Board.
- Fruit and vegetable product manufacturing units are not allowed without license

Livestock:

- Grazing of livestock in forest areas without taking required permission from the Forest Department will not be supported. However traditional forest dwellers have access to grazing areas, pastoralist routes as per the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.
- Grazing of livestock that are not vaccinated in forest areas will not be supported.

Fisheries

- The area upto 8 km from the shore is reserved for traditional craft and motor boats are not allowed within 8 kms.

- Traditional crafts are not allowed to fish beyond 8 kms from the shore. Mechanized vessels below15 mts OAL should operate beyond 8kms only and above 23 OAL beyond 23 kms.
- Mechanised fishing vessels of 25 Gross tonnage and above or 15 m and above of length shall be allowed to operate only beyond 15 km from the coast.
- The mesh size of net used by traditional and mechanised vessels should not be less than 1/2 inch.
- No vessel to be engaged in fishing using nets with mesh size below 15 mm.
- Shrimp trawlers engaged in fishing without Turtle Excluder Device (TED) are not allowed
- Fishing is not allowed during ban or closed season from 15th April to 31st May during breeding season in order to conserve fish stocks and biodiversity.

Forests and Wildlife

- Activities that involve use of forest land for non-forest purposes without the permission of the Forest Department will not be supported.
- Extraction, transport, processing, sale of forest produce including non timber forest produce without taking required permission from the Forest Department will not be supported. However traditional forest dwellers have access as per the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.
- Felling of trees without taking required permission from the Forest Department will not be supported.
- Setting up of saw mills or any other timber processing mills without the permission of the Forest Department will not be supported.
- Activities that involve destruction of wildlife or of wildlife habitat will not be supported.
- Clearing, kindling fire, damaging trees (felling, girdling, lopping, topping, burning, stripping bark and leaves), quarrying stone, etc., in reserved and protected forests will not be supported.

Sand mining:

- 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 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 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, Penna) sand mining may be permitted without affecting existing irrigation, drinking water or industrial uses.
- Sand mining shall not be permitted within 15 metres or 1/5th of the width of the stream bed from the bank, whichever is more.
- In streams and rivers where the thickness of sand is quite good (more than 8 metres), the depth of removal may 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.

Any other Activities with Significant Adverse Environmental Impact:

Activities that are likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented, with impacts that may affect an area broader than the site of the activity are not to be supported.

Annexure 3:

List of Prohibited Dyes

LIST OF 42 BENZIDINE BASED DYES PROHIBITED FROM 1993

S.No.	CI Generic Name	CI Constn. No.
1.	Acid Orange	45 22195
2.	Acid Red	85 22245
3.	Acid Black	29 -
4.	Acid Black	94 30336
5.	Azoic Diazo Compo.112	37225
6.	Direct Yellow 1	22250
7.	Direct Yellow 24	22010
8.	Direct Orange 1	22370
9.	Direct Orange 8	22130
10.	Direct Red 1	22310
11.	Direct Red 10	22145
12.	Direct Red 13	22153
13.	Direct Red 17	22150
14.	Direct Red 28	22120
15.	Direct Red 37	22240
16.	Direct Red 44	22500
17.	Direct Violet 1	22570
18.	Direct Violet 12	22550
19.	Direct Violet 22	22480
20.	Direct Blue 2	22590
21.	Direct Blue 6	22610
22	Direct Green 1	30280
23.	Direct Green 6	30295
24.	Direct Green 8	30315
25.	Direct Green 8:1	--
26.	Direct Brown 1	30045
27.	Direct Brown 1:2	30110
28.	Direct Brown 2	22311
29.	Direct Brown 6	30140
30.	Direct Brown 25	36030
31.	Direct Brown 27	31725
32.	Direct Brown 31	35660
33.	Direct Brown 33	35520
34.	Direct Brown 51	31710
35.	Direct Brown 59	22345
36.	Direct Brown 79	30056
37.	Direct Brown 95	30145
38.	Direct Brown 101	31740
39.	Direct Brown 154	30120
40.	Direct Black 4	30245

41.	Direct Black 29	22580
42.	Direct Black 38	30235

LIST OF 70 AZO DYES PROHIBITED FROM JUNE 1997.

S.No.	CI Generic Name	CI Constn. No.
1	Acid Red 4	14710
2	Acid Red 5	14905
3	Acid Red 24	16140
4	Acid Red 26	16150
5	Acid Red 73	27290
6	Acid Red 114	23635
7	Acid Red 115	27200
8	Acid Red 116	26660
9	Acid Red 128	24125
10	Acid Red 148	26665
11	Acid Red 150	27190
12	Acid Red 158	20530
13	Acid Red 167	--
14	Acid Red 264	18133
15	Acid Red 265	18129
16	Acid Red 420	--
17	Acid Voilet 12	18075
18	Acid Brown 415	--
19	Acid Black 131	--
20	Acid Black 132	--
21	Acid Black 209	--
22	Basic Red 111	--
23	Basic Red 42	--
24	Basic Brown 4	21010
25	Developer 14 = Oxidation Base 20	76035
26	Direct Yellow 48	23660
27	Direct Orange 6	23375
28	Direct Orange 7	23380
29	Direct Orange 10	23370
30	Direct Orange 108	29173
31	Direct Red 2	23500
32	Direct Red 7	24100
33	Direct Red 21	23560
34	Direct Red 22	23565
35	Direct Red 24	29185
36	Direct Red 26	29190
37	Direct Red 39	23630
38	Direct Red 46	23050
39	Direct Red 62	29175
40	Direct Red 67	23505
41	Direct Red 72	29200

42	Direct Violet 21	23520
43	Direct Blue 1	24410
44	Direct Blue 3	23705
45	Direct Blue 8	24140
46	Direct Blue 9	24155
47	Direct Blue 10	24340
48	Direct Blue 14	23850
49	Direct Blue 15	24400
50	Direct Blue 22	24280
51	Direct Blue 25	23790
52	Direct Blue 35	24145
53	Direct Blue 53	23860
54	Direct Blue 76	24411
55	Direct Blue 151	24175
56	Direct Blue 160	--
57	Direct Blue 173	--
58	Direct Blue 192	--
59	Direct Blue 201	--
60	Direct Blue 215	24115
61	Direct Blue 295	23820
62	Direct Green 85	30387
63	Direct Blue 222	30368
64	Direct Black 91	30400
65	Direct Black 154	--
66	Disperse Yellow 7	26090
67	Disperse Yellow 23	26070
68	Disperse Yellow 56	--
69	Disperse Orange 149	--
70	Disperse Red 151	26130

Annexure 4

Classification of Industries for Consent Management:

List of Industries under 'Green' Category

1. Assembling of Acid lead battery (upto 10 batteries per day excluding lead plate casting)
2. Aluminium utensils from aluminium circles
3. Assembly of air coolers / conditioners, repairing and servicing
4. Assembly of bicycles, baby carriage and other small non-motorised vehicles
5. Automobile fuel outlet (only dispensing)
6. Ayurvedic and Homeopathic medicine (without boiler)
7. Bailing (hydraulic press) of waste papers
8. Bakery / Confectionery / Sweets production (with production capacity < 1 TPD with oil, gas or electrical oven)
9. Bio-fertiliser & bio-pesticide, without using inorganic chemicals
10. Biomass Briquettes (sun drying) without using toxic or hazardous wastes
11. Biscuit trays etc., from rolled PVC sheet (using automatic vaccum forming machine)
12. Blending and packaging of Tea
13. Blending of melamine resins & different powder, additives by physical mixing
14. Block making for printing without foundry (excluding wooden block making)
15. Brass & Bell metal utensils manufacturing from circle (without re-rolling facility)
16. Candy
17. Cardboard or corrugated box and paper products (excluding paper or pulp manufacturing and without using boiler)
18. Carpentry and wooden furniture manufacturing (excluding Saw Mill) with the help of electrical (motorized) machines such as electric wood planner, steel saw cutting circular blade etc.
19. Cement products (without using Asbestos) like pipe, pillar, jafri, well ring, blocks / tiles etc. (should be done under closed covered shed to control fugitive emissions)
20. Ceramic colour manufacturing (not using boiler and wastewater recycling process)
21. Chalk making from plaster of Paris
22. Chilling plant and ice making without use of ammonia
23. Coated electrode manufacturing
24. Compact disc, computer floppy & cassette manufacturing
25. Compressed oxygen gas from crude liquid oxygen
26. CO_2 recovery
27. Cotton and woolen hosiery making (SSI & cottage industries)
28. Cotton spinning & weaving (small scale)
29. Decoration of ceramic cups & plates by electric furnace
30. Diesel Generator sets (15 KVA to 1 MVA)
31. Diesel pump repairing & servicing
32. Distilled water
33. Electric lamp (bulb) manufacturing (small scale)
34. Electrical & electronic items assembling
35. Flavoured bettle nut production / grinding
36. Flour mills (dry process)

37. Fly ash bricks / blocks manufacturing
38. Fountain pen manufacturing
39. Glass ampules & vials making from glass tubes
40. Glass putty and sealant
41. Glass, ceramic, earthen potteries and tile manufacturing using electrical kiln or not involving fossil fuel kilns
42. Gold and silver smithy (purification with acid, smelting operating and sulfuric acid polishing operation) (using less than or equal to 1 litre of Sulphuric Acid / Nitric Acid per month.
43. Groundnut decorticating (dry)
44. Handloom / carpet weaving (without dyeing and bleaching operation)
45. Hotels (upto 20 rooms)
46. Insulation and other coated papers (excluding paper or pulp manufacturing) manufacturing.
47. Jobbing and machining
48. Leather cutting and stitching (more than 10 machines and using motor)
49. Leather footwear and leather products (excluding tanning and hide processing) (except cottage scale).
50. Lubricating oils, greases or petroleum based products (only blending at normal temperature)
51. Manufacturing of coir items from coconut husk
52. Manufacturing of metal caps, containers, etc.
53. Manufacturing of optical lenses (using electrical furnace)
54. Manufacturing of pasted veneers without using boiler or Thermic Fluid Heater or by sun drying
55. Manufacturing of shoe brush & wire brush
56. Manufacturing of silica gel (without furnace)
57. Medical oxygen
58. Mineralized water
59. Oil mill ghani & extraction (no hydrogenation / refining)
60. Organic and inorganic nutrients (by physical mixing)
61. Organic manure (manual mixing)
62. Paints and varnishes (mixing and blending) without ball mill
63. Packing of powdered mill
64. Paper pins and U –clips
65. Phenyl / Toilet cleaner formulation & Bottling
66. Reel manufacturing
67. Polythene & plastic processed products manufacturing (virgin plastics)
68. Poultry, hatchery, Piggery.
69. Power looms (without dyeing and bleaching)
70. Printing press
71. Puffed rice (muri) (using oil, gas or electrical heating system)
72. Ready mix cement concrete
73. Reprocessing of waste cotton
74. Rope (Cotton & Plastic)
75. Rubber goods industry (with baby boiler only)
76. Scientific and mathematical instruments manufacturing
77. Soap manufacturing (Handmade without steam boiling)
78. Solar module (Non conventional energy apparatus) manufacturing unit
79. Solar power generation through solar photovoltaic cell, wind power & mini hydel power (<25 MW)
80. Spice grinding (<20 HP motor)
81. Steel furniture without spray painting
82. Steeping and processing of grains
83. Surgical and medical products not involving effluent / emission generating processes.

84. Synthetic detergent formulation
85. Teflon based products
86. Tyres and tubes re-treading (without boiler)

List of Industries under 'Orange' Category

1. Almirah, Grill Manufacturing
2. Aluminium and copper extraction from scrap using oil fired furnace
3. Automobile servicing, repairing and painting (excluding only fuel dispensing)
4. Ayurvedic and Homeopathic medicine
5. Bakery & confectionery units with production capacity >1 TPD
6. Biaxially oriented PP film along with metalising operation
7. Brickfields (excluding fly ash brick manufacturing using lime process)
8. Building & construction projects more than 20,000 sqm built up area
9. Cashew nut processing
10. Chanachur and ladoo from puffed and beaten rice (muri and chira) using husk fired oven
11. Chilling plant, cold storage and ice making
12. Coffee seed processing
13. Coke briquetting (sun drying)
14. Cotton spinning and weaving (medium and large scale)
15. Cutting , sizing and polishing of marble stones
16. Dairy and dairy products (small scale) (capital investment on plant & machinery <Rs.1.0 crore)
17. Dal mills
18. DG set of capacity >1 MVA but < 5 MVA
19. Digital printing on PVC cloth
20. Dismantling of rolling stocks (wagons / coaches)
21. Dry cell battery (excluding manufacturing of electrodes) & assembling & charging of acid lead battery in micro scale [< Rs. 25 lakhs]
22. Emery powder (fine dust of sand) manufacturing
23. Engineering and fabrication units (with investment on plant & machineries < Rs.10 crores)
24. Excavation of Sand from the river bed (excluding manual excavation)
25. Facility of handling, storage and transportation of food grains in bulk.
26. Fertilizer (granulation and formulation only)
27. Fish feed, poultry feed and cattle feed
28. Fish processing and packaging (excluding chilling of fish)
29. Foam manufacturing
30. Food & food processing including fruits & vegetable processing
31. Forging of ferrous & non-ferrous metal (using oil or gas fired boilers)
32. Formulation / palletization of camphor tablets, naphthalene balls from camphor / naphthalene powders.
33. Glass, Ceramic, Earthen Potteries and Tile manufacturing, using oil or gas fired Kiln, Coating on glasses using Cerium Fluoride, Magnesium Fluoride etc.
34. Glue from starch (physical mixing)
35. Gravure printing, digital printing on flex, vinyl
36. Heat treatment using oil fired furnaces (excluding cyaniding)
37. Hotels (less than 3 star) or hotels having >20 rooms and less than 100 rooms
38. Ice cream
39. Infrastructure development project
40. Jute processing without dyeing
41. Liquid floor cleaner, black phenyl, liquid soap, glycerol monostearate manufacturing.

42. Manufacture of mirror from sheet glass
43. Manufacturing of Iodized Salt from Crude / Raw Salt
44. Manufacturing of mosquito repellent coil
45. Manufacturing of tooth powder, toothpaste, talcum powder and other cosmetic items
46. Mechanized laundry using oil fired boiler
47. Modular wooden furniture from particle board, MDF, swan timber etc., Ceiling tiles / partition board from saw dust, wood chips etc. & other agricultural waste using synthetic adhesive resin, wooden box making.
48. Packing materials manufacturing from non asbestos fibre, vegetable fibre yarn
49. Paint blending & mixing (Ball mill)
50. Pharmaceutical formulation and for R & D purpose (for sustained release / extended release of drugs only and not for commercial purpose)
51. Plyboard manufacturing (including vineer & laminate) with oil fired boiler / thermic fluid heater (without resin plant)
52. Potable alcohol (IMFL) by blending, bottling of alcoholic products (capital investment on plant & machinery < Rs. 1.0 crore).
53. Power press
54. Printing ink manufacturing
55. Printing or etching of glass sheet, using hydrofluoric acid
56. Producer gas plant using conventional up-drift coal gasification (linked to rolling mills, glass and ceramic industry, refractories for dedicated fuel supply)
57. Pulverization of bamboo and scrap wood
58. Repairing of electric motor & generator
59. Reprocessing of waste plastic (excluding PVC)
60. Rice mill less than 10 TPD & rice hullers
61. Rolling mill (oil or gas fired) and cold rolling mill
62. Saw mill
63. Seasoning of wood in steam heated chamber
64. Silk screen printing, saree printing by wooden blocks
65. Spice grinding (> 20 HP motor)
66. Spray painting, paint baking, paint stripping
67. Tamarind powder manufacturing
68. Tea processing
69. Thermocol manufacturing
70. Thermometer making
71. Transformer repairing / manufacturing
72. Tyres and tubes vulcanization / hot retreading
73. Wire drawing & wire netting.

List of Industries under 'Red' Category

1. Airport and Commercial Air Strips
2. Aluminium smelter
3. Asbestos and asbestos based industries
4. Automobiles Manufacturing (Integrated facilities)
5. Basic chemicals and electro chemicals and its derivatives including manufacture of acids
6. Ceramic, Refractories
7. Cement
8. Chlor Alkali

9. Chlorates, perchlorates and peroxides
10. Chlorine, fluorine, bromine, iodine, and their compounds
11. Coal washeries
12. Copper smelter
13. Coke making, liquefaction, coal tar distillation or fuel gas making
14. Common Treatment and disposal facilities (CETP, TSDF, E- Waste recycling, CBMWTF, Effluent conveyance project, incinerators, Solvent / Acid recovery plant, MSW sanitary landfill sites, STP).
15. Distillery including Fermentation industry
16. Dyes and Dye-intermediates
17. Dry coal processing / mineral processing, industries involving ore sintering, palletisation, grinding, pulverization.
18. Emulsion of oil & water
19. Fermentation industry including manufacture of yeast, beer, distillation of alcohol (ENA)
20. Fertilizer (basic) (excluding formulation)
21. Ferrous and Non Ferrous metal extraction involving different furnaces through melting, refining, reprocessing, casting and alloy making.
22. Fibre glass production and processing (excluding moulding)
23. Fire crackers manufacturing and bulk storage facilities
24. Flakes from rejected PET bottle
25. Fly ash export, transport and disposal facilities.
26. Health care establishment (as defined in BMW Rules)
27. Heavy engineering including Ship Building (with investment on Plant & Machineries more than Rs. 10 crores)
28. Hot mix plants
29. Hotels (3 Star & above) and Hotels having 100 rooms and above.
30. Hydrocyanic acid and its derivatives.
31. Industrial carbon including electrodes and graphite blocks, activated carbon, carbon black.
32. Industrial estates / parks/complexes / areas / export processing zones/ SEZs / Biotech parks/ leather complex
33. Industrial inorganic gases namely:
a) Chemical gases, Acetylene, hydrogen, chlorine, fluorine, ammonia, sulphur dioxide, ethylene, hydrogen sulphide, phosphine
b) Hydrocarbon gases, Methane, ethane, propane
34. Industries engaged in recycling / reprocessing / recovery / reuse of Hazardous Waste under Schedule IV of Hazardous Waste (M,H & TBM) Rules, 2008 and its amendments.
35. Industry or process involving foundry operations.
36. Industry or process involving metal surface treatment or process such as pickling / plating / electroplating / paint stripping / heat treatment / phosphating or finishing and anodizing / enameling / galvanizing.
37. Iron and Steel (involving processing from ore / integrated steel plants and or Sponge Iron Units.
38. Isolated storage of Hazardous Chemicals (as per schedule of Manufacture, Storage & Import of Hazardous Chemicals Rules, 1989 as amended)
39. Lead Acid battery manufacturing (excluding assembling & charging of acid lead battery in micro scale (< Rs. 25 lakhs)
40. Lime manufacturing (using Lime Kiln)
41. Manufacturing of Explosives, detonators, fuses including management and handling activities.
42. Manufacturing of Glass
43. Manufacturing of Glue and gelatin
44. Manufacturing of Lubricating oils, greases or petroleum based products
45. Manufacturing of Paints, Varnishes, pigments and intermediate (excluding blending / mixing)

46. Manufacturing of Starch / Sago
47. Milk processing and dairy products (integrated project)
48. Mineral stack yards / Railway sidings
49. Mining and ore benification
50. New Highway construction projects
51. Non alcoholic beverage (soft drinks) & bottling of alcoholic / non-alcoholic products (capital investment on plant & machinery > Rs. 1 crore)
52. Nuclear Power Plants
53. Oil & Gas extraction including CBM (offshore & onshore extraction through drilling wells)
54. Oil and gas transportation pipeline
55. Oil Refinery (Mineral Oil or Petro Refineries)
56. Organic chemicals manufacturing
57. Parboiled rice mills (more than 10 TPD)
58. Pesticides (Technical) (excluding Formulation)
59. Petrochemicals (Manufacture of and not merely use of as raw material)
60. Pharmaceuticals (excluding formulation)
61. Pulp and Paper (paper manufacturing with or without pulping)
62. Phosphate rock processing plant
63. Phosphorous and its compounds
64. Photographic films and its chemicals
65. Ports & Harbours, Jetties and Dredging operations
66. Power Generation Plants (except Wind, Solar and Mini Hydel Power plants of capacity <25 MW) and D.G. set of capacity > 5 MVA.
67. Processes involving chlorinated hydrocarbons.
68. Railway Locomotive workshops / Integrated Road Transport workshop / Authorised service centres.
69. Reprocessing of used oils and waste oils
70. Ship breaking activities
71. Slaughter houses (as per the notification S.O.270 (E), dated 26.03.2001) and meat processing industries, bone mill, processing of animal horns, hoofs and other body parts.
72. Steel and steel products using various furnaces like blast furnaces / open hearth furnace / induction furnace / arc furnace/ submerged arc furnace / basic oxygen furnace / hot rolling using reheating furnaces
73. Stone crushers
74. Sugar (excluding Khandsari)
75. Surgical and medical products involving prophylactics and latex
76. Synthetic detergents and soaps (excluding formulation)
77. Synthetic fibres including rayon, tyre cord, polyester filament yarn
78. Synthetic resins
79. Synthetic rubber excluding molding
80. Tanneries
81. Thermal power plants
82. Tobacco products including cigarettes and tobacco / opium processing
83. Vegetable oils including solvent extraction and refinery / hydrogenated oils
84. Yarn / textile processing involving any effluent / emission generating process, bleaching, dyeing, printing and scouring
85. Zinc smelter

Note: Any industry / industrial activity which is not covered in above list having Coal fired Boiler with stream generation capacity more than 5 T/hr will be covered under Red Category

Note: The industry which do not fall any of the above mentioned three categories (i.e. Red/Orange/Green), decision with regard to their categorisation will be taken by a committee at Head. Office level comprising of the Member Secretary and two senior offices of the Board/Committee.

Annexure 5

Pesticides mentioned in the WHO list that are commonly used in the agricultural subprojects along with their trade names:

Pesticides falling under class Ia: Extremely hazardous, not permitted for use in the project

Pesticide	Trade name
Aldicarb	Temik
Parathion	Folidol, Ekatox, Thiophos
Parathion methyl	Metacid
Phorate	Thimmet
Phosphamidon	Dimecron

Pesticides falling under class Ib: Highly hazardous, not permitted for use in the project

Pesticide	Trade name
Carbofuran	Furadan, Thimmet
Dichlorovas	Nuvan
Monocrotophos	Nuvacron
Warfarin	-
Zinc phosphide	-

Pesticides falling under class II: Hazardous, not permitted for use in the project

Pesticide	Trade name
Cypermethrin	Cymbush
Alpha cypermethrin	-
Endosulfan	Thiodon
Fenithrothion	-
Fenvalerate	Sumicidin
Carbaryl	Sevin
Gamma HCH	BHC
Imidacloprid	-
Permethrin	Ambush
Chlorpyrifos	Dursban
Quinalphos	Ekalux

Pesticides falling under class III: Permitted for use in the project along with Integrated Pest Management Practices

Pesticide	Trade name
Acephate	Orthene, Dimethoate, Rogar
Allethrin	Pynamin
Isoproturon	
Malathion	
Sulphur	

Annexure 6

Commodity wise Environment Guidelines

1. Paddy:

Overview of Paddy in Andhra Pradesh (erstwhile):

Rice is the Principal food crop cultivated throughout the state of Andhra Pradesh. In AP rice is mostly cultivated under irrigated eco-system under canals (52%), tube wells (19.31%) tanks (16.2%), other wells (8.8%) and other sources (3.7%).

In AP rice productivity is 3333 kg/ha compared to 2001 kg/ha (India) and 4112 kg/ha (world). Rice productivity is highest in Nellore district (4473 kg/ha) followed by East Godavari (4028 kg/ha), West Godavari (3928 kg/ha) and lowest in Vishakhapatnam (2075 kg/ha). The crop is grown in three ecosystems viz., irrigated ecosystem (50.6%), rain fed low land (43.8%) and rain fed uplands (5.6%).[4]

Interventions in Paddy in APRIGP**:**

Around 26,517 producers cultivating 28,520 acres are targeted by APRIGP to improve paddy productivity and income in sustainable manner. The interventions include productivity enhancement, value addition and certification. Paddy value chains are proposed in the districts East Godavari, West Godavari, Krishna and Visakhapatnam.

APRIGP will invest in Paddy value chains starting from Productivity enhancement to value addition and marketing.

Potential Environmental issues and Environment friendly alternatives in the Paddy value chain:

Activity in the value chain	**Possible issues**	**Interventions, Best practices**
Interventions for Productivity Enhancement		
Varietal selection	Varieties not suitable to local environmental conditions may not respond well and increase cost of pest and disease management.	Varieties suitable to the local climatic conditions and environment should be selected. The list of recommended varieties for the different zones of Andhra Pradesh is attached as – *Annexe1.*
Method of cultivation (with respect to irrigation and water use)	Long periods of flooding rice fields results in Methane emission which is green house gas playing key role in global warming. Flood irrigation increases the use of precious water	System of Rice Intensification (SRI) can be taken up under bore well irrigated areas – Most of the area under the proposed mandals falls under bore well irrigated areas.

[4] Status paper on Rice in Andhra Pradesh, Dr. C. Cheralu (Rice Breeding), viewed at http://www.rkmp.co.in/sites/default/files/ris/rice-state-wise/Rice%20State%20Wise%20Andhra%20Pradesh_0.pdf on 15th March 2014.

	resources and in ground water irrigated areas it also increases the energy consumption for pumping ground water. This leads to over exploitation of ground water. Application of urea under flood conditions leads to Nitrous oxide emissions	Application of Azolla / Nadep compost under SRI method to supply nitrogen in place of urea.
Cropping pattern	Continuous mono cropping of paddy may lead to depletion of similar kind of nutrients from the soil which in turn would lead to decreased productivity in long term. In irrigated areas of Andhra Pradesh rice is grown in Rice-Rice rotation which is very detrimental to the soil health.	It is advisable to follow a Rice-Legume rotation pattern of cropping so as to maintain the quality of soil for a long time. Rice can be followed by short duration legumes such as Green gram, black gram or horse gram.
Managing soil fertility	Excessive use of chemical fertilizers without knowing the nutrient status of the soil can be detrimental for soil health. This also increases cost of cultivation. Besides the chemical fertilizers leave residues in the soil which leads to salinity and alkalinity of the soil which in turn affects the soil structure.	Integrated Nutrient management practices (listed below) are to be followed for supplying nutrients in required quantities without undermining the soil quality. • Green manure crops such as cow pea, etc., can be grown 25 to 30 days before the transplantation of paddy. These are then incorporated in the soil during land preparation/ploughing to improve fertility. • Application of 1 ton/ha of Glyricidia leaf manure provides 21 kg N, 2.5 kg P, 18 kg K, 85 g Zn, 164 g Mn, 365 g Cu, 728 g Fe besides considerable quantities of S, Ca, Mg, B, Mo etc. Six feet tall Glyricidia plants on the bunds around one field (on 400 m bund) can provide 22.5 kg N/ha after 3 years and up to 77 kg N/ha from the 7th year onwards. Amount of Glyricidia leaf manure application depends on the growth of boundary plantations. Usually about 1 to 2 Tons/h leaf manure can be applied.[5] • Other organic manures and fertilisers that

[5] Soil Health Improvement with Gliricidia Green Leaf Manuring in Rainfed Agriculture On farm Experiences by Ch. Srinivasa Rao, B.Venkateswarlu, M. Dinesh Babu, Suhas P. Wani, Sreenath Dixit, K.L. Sahrawat and Sumanta Kundu, viewed at http://www.crida.in/naip/pub/Gliricia_Booklet.pdf on 24th February 2014.

		can be applied are Farm Yard Manure (2-5 t/ha), Vermicompost (5-10 q/ha), bio fertilizers such as Azospirillum (2 kg/ha) and Phosphate Solubilising Bacteria (2 kg/ha) added to soil at the time of puddling (in traditional method of cultivation), goat droppings (1.25 t/ha), poultry manure (1.25 t/ha), wood ash (1.25 t/ha) etc.
Weed management	Application of weedicides causes damage to Fish, impeded propagation of Algae and other non targeted organisms. This will also lead to chemical residues in soil and water.	• Application of Azolla suppresses the weed growth and provides nitrogen to the crop. • Mechanical weeding with weeders / Manual weeding
Pest control	Use of chemical pesticides cause damage to aquatic bio diversity in rice fields and surrounding water bodies and leaves chemical residues.	Non Pesticide Management Practices are to be followed for pest control as suggested below: • Deep summer ploughing to kill hibernating pest larvae • Use of Pest resistant or tolerant varieties – given as *Annexe 1.* • Avoiding use of excess nitrogen • Use of pheromone traps and light traps • Use of neem based pesticides • Release of bio control agents
Interventions for Storage, processing etc.		
Storage	Fumigation of storage godowns and storage spaces with Methyl bromide and phosphine in order to control store product pests may cause damage to human health.	• Clean rice barn, warehouse or storehouse before storing the produce. The regular cleaning of the storage is recommended. • Spray plant extract, such as Bitter bush or Siam weed (*Eupatorium odoratum* L.) to kill insects on the floor, wall and vacant space in the storage. • Mix seeds with plant extracts such as Neem (*Azadirachta indica* A.), dried Long pepper flower (*Piper longum*) and Sweet flag (*Acorus calamus* L.) • Fumigate the storage structures with carbon dioxide gas.
Transportation	Contamination is possible during package and transport.	• Containers and sacks used for packing, as well as vehicle for transporting organic rice, should be clean and free from any contamination of chemical substances and other rice. It is not recommended to use vehicle that has been loaded with soil,

		animals, manures, fertilizers or chemicals that may cause contamination of pathogenic and toxic substances, unless such vehicle has been properly cleaned before use. • Separate Carrier or vehicle should be allotted to handle organic rice. Organic rice shall not be comingled with non-organic commodity and other prohibited materials or substances for organic agriculture during transportation from production site to distribution center.
Milling[6]	Water used for soaking the paddy, especially for parboiled rice production, if not properly treated could result in water pollution and odour nuisance to local community. Air pollution both on site and in the surrounding locality due to release of dust to the atmosphere from handling or processing of the paddy or its by-products is a major environmental concern for rice mills.	• Good and adequately maintained drainage to facilitate run-off and minimize the likelihood of flooding. Regular inspection of bulk storage tanks to minimize the risk of surface water pollution. • Installation of interceptor traps for solids, oil and fuel to reduce the control release of contaminated water via the surface drains. Separation of milling areas from all other areas of operation. Water proofing of mill floor and all other floors. • Adequate ventilation should be provided to prevent dust pollution and reduce heat. Prevention of dusts on machinery and in the building by timely cleaning operations. Design of chimney and vents of sufficient height and appropriate technology to avoid causing local nuisance of dust and smoke emissions. Walls should be designed in a way to prevent accumulation of dust and entry of rodents, birds, or pests.
Energy usage[7]	Different operations in paddy processing require considerable energy for parboiling, mechanical drying and milling.	Hulling of rice before parboiling process is also a possible option to reduce energy consumption for rice parboiling. It would save 40% of energy however this process is susceptible to contamination if the processing equipment is not as per food grade quality and it needs shade

[6] Scoping Study on Clean Technology Opportunities and Barriers in Indonesian Palm Oil Mill and Rice Mill Industries: International Finance Corporation. Prepared by IRG, Philippins, viewed at http://www.ifc.org/wps/wcm/connect/8894fe804726241c945cbf2b131bed2a/Scoping%2Bstudy%2Bclean%2Btechnology%2Bopportunities%2Bin%2BIndonesia.pdf?MOD=AJPERES on 27th February 2014.

[7] Energy Utilization and Environmental Aspects of Rice Processing Industries in Bangladesh: by Mohammed Ahiduzzaman and Abul K. M. Sadrul Islam, viewed at http://www.mdpi.com/1996-1073/2/1/134 on 25th February 2014.

		drying Instead of open floor drying under sunshine as in traditional practices.
Waste management	Disposal of solid wastes, particularly unused rice husk occupies space and creates inconvenience. Effluent produced during cleaning of equipment will pose a problem to surrounding environment.	Paddy husk can be reused as fuel for paddy drying, to run steam generator or gassifier. Charcoal briquetting units can be set up which use paddy husk as raw material. Treatment of effluent and wastewater before release as per the standards of Pollution Control Board.

Marketing opportunities for Organic Paddy:

Rice being a major food commodity in the state organic rice can be marketed with premium through retails or wholesale outlets. Organic rice has demand in international market as well.

- Agricultural and Processed Food Products Export Development Authority (APEDA) makes efforts to produce and export basmati rice, aromatic rice and other rice varieties by establishing model farms.
- Can be linked with Nutrition cum Day Care Centres (NDCCs)

Support Agencies:

- Directorate of Rice Research (Indian Council of Agricultural Research)
  Rajendranagar, Hyderabad – 500030.
  Tele fax – 040 – 24591217.
- Acharya N.G. Ranga Agricultural University, Rajendranagar.
- Respective Krishi Vignan Kendras (KVKs) and District Agriculture Advisory technology Centres (DAATCs) and Agriculture Technology Management Agency (ATMA).

2. **Red gram:**

Overview of Paddy in Andhra Pradesh (erstwhile):

Andhra Pradesh has an area about 4.63 lakh hectares under red gram with annual production of 3.02 lakh tonnes. Its contribution to India's production is 12.75 per cent per annum. It is grown mostly in all the districts. The major varieties grown are LRG 30, LRG 41, Durga, Laxmi, Asha, Maruthi and PRG-158. The productivity of red gram is 500 kgs per ha in Andhra Pradesh (2011) against a national average of 675 kgs per ha which is considerably low.

Interventions in Red gram in APRIGP**:**

APRIGP will target 18,940 red gram producers cultivating 36,000 acres of land. The objective is to enhance the yield from 1.8 qtls per acre to 2.8 qtls per acre through sustainable agricultural practices. APRIGP will invest in Red gram value chains in productivity enhancement, certification, aggregation and value addition. The proposed districts for value chain interventions Kadapa, Nellore, Prakasam, Vizianagaram, Ananatapur and Kurnool. In total 34 mandals will be covered.

Potential Environmental issues and Environment friendly alternatives in the Red gram value chain:

Activity in the value chain	**Possible issues**	**Interventions, Best practices**
Interventions for Productivity Enhancement		
Varietal selection	Varieties not suitable to local environmental conditions may not respond well and increase cost of pest and disease management.	The recommended varieties for the state of Andhra Pradesh are: LRG 30, LRG 41, Durga, Laxmi, Maruthi, Asha and PRG-158. In seed production farms rouging (removing the plants from previous season) is important as it contaminates genetic purity of the seeds. It is advisable to select a farm where red gram is not cultivated before for seed production.
Cropping system - Intercropping	Mono-cropping of red gram is unsustainable due to pest attacks, and delayed income.	Red can be is grown as an intercrop, between sorghum (jowar), pearl millet (bajra), maize and cotton. Under organic management, when red gram is intercropped with soybean/cowpea and moong, it has been found to enrich the soil significantly. This combination can also be used in the first year of conversion of conventional farms to organic, in order to make the soil alive and fertile.

		Growing of two rows of moong after every two rows of red gram is also beneficial. It not only ensures some moong yield as a bonus, but its biomass mulch reduces the growth of weeds, preserves soil moisture and ensures increased productivity of red gram.
Irrigation	As red gram is a rain-fed crop which is generally grown in assured rainfall areas, it usually does not require any irrigation. Water stress could develop after excessive rain or flood or because of improper drainage Excess irrigation leads to water logging in low lying areas	Red gram requires 35–40 cm water during its entire growth period. Optimum moisture is necessary during (a) budding; (b) flowering; and (c) pod formation stages. In case of water stress, protective irrigation may be given in alternate rows at these three stages. Using harvested intercrops biomass as mulch to preserve soil moisture and to maintain microbial activity. Proper drainage is essential in low lying areas. Draining out the excess water at the earliest by using drainage channels if there is a gradient and if not by using motors, Taking up the gap filling at the earliest Inter cultivation at optimum field moisture condition, Apply 4-5 kg N/acre after draining excess water, To spray KNO3 1 % or water soluble fertilizers like 19-19-19, 20-20-20, 21-21-21 at 1% to support nutrition
Manures and Fertilisers	Fertilizers applied without soil testing will leads to leaching of nutrients, excess input cost or less yield.	Soil testing based fertilizer application is recommended. Plant trees of neem, babul, pongam, sesban, glyricidia, etc., on farm bunds to get leaf manure.
Pest Management	Pod borers or bollworms (Helicoverpa), aphids, jassids, thrips, mites, etc., are some of the main insect pests that affect red gram. Fusarium wilt disease can also be a serious problem in some places. Boll worm attack is most damaging and is therefore of major concern. The chemicals recommended for	The following Non Chemical Pest management methods can be followed to keep pest population under control. • Intercropping of red gram with soybean, moong, groundnut, sorghum/maize and random planting of marigold and Hibiscus subdariffa (lal ambari) help in keeping the pest population under the ETL.

	red gram pest control cannot be used in the project.	• To reduce pest attacks and to ensure intermittent income, in mono cropping mix 1–2% seeds of sorghum or any other millet with red gram at the time of sowing. • One or two rows of marigold around the field or random planting of about 100 marigold plants/acre also helps in the control of insects and pests • Jaggery powder (10 kg/ha) is sprayed on the soil surface, to attract ants that predate on the larvae. • Approx. 10–12 bird perches installed per hectare attract birds that predate on the pests. Yellow rice (1 kg rice cooked with turmeric powder) kept on or near the perches will attract predatory birds. • Inundated release of Chrysoperla 5,000 eggs 15 days after sowing and Trichogramma 50,000 eggs (2–3 cards) 30 days after sowing help to keep pest populations under control. • Spraying of 5% NSKE at 15 day interval keeps pest under control • Garlci Chilli extract with cow urine also keeps pest population under control. • 500–1000 ml HNPV (nuclear polyhydrous virus) per ha.controls pod borer.
Interventions for Storage, processing etc.		
Storage	Chemicals, fertilizers or irrigation water with high chlorine could result in lower quality of red gram grains. Red gram grains are mostly transported and stored in packed woven jute or polypropylene bags which do not offer barrier against moisture and insect	Farmers should be advised properly on the standard storage practices for red gram and the dangers of using chemicals and fertilizers. Packaging in air tight bags is suggested to retain quality of the grains with enhanced shelf life and to protect them from the adverse environmental factors.

	pests. Beetles affect red gram in storage.	Dry the clean grain in the sun to ensure moisture below 8%. Mix crushed neem leaves with the Red gram grain before storing it in gunny bags. Gunny bags can also be treated with 5% neem oil. Chemicals/pesticides/weedicides / fertilizers should not be stored along with raw red gram.
Milling	Noise pollution to the workers and in the neighbourhood due to milling Fine dust during milling will lead to health issues like allergy, asthma in long run.	Noise protective equipment should be provided to the operator of the machine. Silencer should be attached to the equipment to reduce noise from the equipment to surrounding areas. Person using these machines must wear mask for preventing the problem related to inhalation
Transport	Organic dal may get contaminated when transported along with other commodities.	Vehicles used for transport for chemicals should not be used for transport of red gram. The vehicle should be cleaned and dried before transportation of red gram grains and Dal after milling
Waste disposal	Disposal of red gram seed coat after milling	Usually this is used in cattle feeds and hence no issue with disposal.

Marketing opportunities for Organic Red gram dal:

- Farmers willing to go on conventional organic can associate with Dharani farming and Marketing Macs limited, Chennakottapalli Village and mandal, Ananatapur,Andhra pradeh, Pin – 515101, accredited under National Programme for Organic Production (NPOP).
- Dal can also be utilized in Nutrition and Day Care Centres

Support Agencies:

- Acharya N.G. Ranga Agricultural University, Rajendranagar
- Respective Krishi Vignan Kendras (KVKs) and District Agriculture Advisory technology Centres (DAATCs) and Agriculture Technology Management Agency (ATMA)
- Lam farm:
  ANGRAU, Agricultural Research Station,
  ARS Lam, PO Lam,
  Guntur 522 034 (AP)
  E-mail ID: pspulses@gmail.com

3. **Turmeric:**

Overview of Turmeric in Andhra Pradesh (erstwhile):

Major turmeric growing states in India are Andhra Pradesh (57%)[8], Karnataka, Maharastra, Odishha and Kerala. The area under turmeric in Andhra Pradesh is 1,58,938 ha and production is 9,85,416 tons[9]. The productivity of turmeric in Andhra Pradesh is 7.4 tons per ha against a national average of 5.1 (2010-11) tons per ha[10]. It is mainly cultivated in Krishna, Guntur, Cuddaph, Kurnool, East and West Godavari, Nizamabad, Karimnagar, Srikakulam and Visakhapatnam districts of Andhra Pradesh. Turmeric pockets in Andhra Pradesh are Cuddapah, Adilabad, Medak, Nizamabad and Guntur.

Interventions in Turmeric in APRIGP :

APRIG will target 50108 producers growing turmeric in 48,539 acres of land. The interventions include augmenting the production, value addition, certification and aggregation for marketing. The area of operation for the turmeric value chain include the districts Srikakulam, Vizianagaram and Visakhapatnam. Operational mandals are 12 covering an area of 48,539 acres. Turmeric has been growing as traditional crop by Tribal farmers in paderu, seethampeta regions.

Potential Environmental issues and Environment friendly alternatives in the Turmeric value chain:

Component	Possible Issue	Intervention, Best practice
Interventions for Productivity Enhancement		
Varietal selection	Varieties not suitable to local environmental conditions may not respond well and increase the chemical inputs and cost of cultivation.	Growing of traditional varieties with interventions such as irrigation, manuring etc. for yield enhancement should be explored. In case of need for varietal replacement suitable varieties should be selected with suggestion from department of Horticulture.
Cropping system - Intercropping	Mono cropping may deplete nutrients as turmeric requires nutrients in high quantities. Weed problem will be more in monocrop.	Turmeric can be grown as an intercrop in coconut plantations.
Planting (seed treatment)	Seed treatment is recommended with Dithane M45 or malathion which cannot be used in project.	Apply cattle manure neem seed cake (25 gms) and Trichoderma (10 gms innoculated in cattle manure) in the pits before planting the rhizomes.

[8]Turmeric, viewed at http://www.icexindia.com/profiles/turmeric_profile.pdf on 19th February 2014.

[9] Area and Production of major Horticulture Crops 2012-13, viewed at http://aphorticulture.nic.in/area_and_production-2012-13.htm on 19th February 2014.

[10] Indian Horticulture Database -2013, National Horticulture Board, viewed at http://nhb.gov.in/area-pro/Indian%20Horticulture%202013.pdf on 27th March 2014.

Nutrient management	Crop requires 300 kg N, 125 kg P2O5 and 200 kg K2O per hectare in organic and inorganic forms. 25 tons of FYM is recommended before ploughing. Use of chemical fertilizers will leave residues in soil and affects microbial activity.	The following organic nutrient management practices can be followed: • 2 days of goat, sheep penning during April, May • 15 tons of FYM after ploughing as basal dose • 2.5 quintals of neem or castor cake after ploughing and 40 days after transplanting • 5 quintals of *Ghana jeevamrutham* at 80 days and 120 days after transplanting • 100 lits of Drava *jeevamrutham* with each irrigation.
Irrigation	Furrow irrigation leads to wastage of water	Turmeric requires frequent irrigation. It requires 20 – 25 irrigation during the crop period. One or two ring wells may dug up to provide regular irrigation. Drip irrigation will lead to higher yields. Following stages are critical stages for irrigation: • Germination stage • Tillering stage • Rhaizome initiation stage • Rhizome development stage Mulching: Mulching with green /dried leaves, live mulch with creepers is essential for germination, check weed growth and to conserve soil moisture. Mulching with Dhaincha, Sunhemp, Glyricidia are the best leaves for mulching.
Pest Management	Heavy incidence of Rhizome rot, leaf spot, bacterial leaf blight and stem borer demands use of pesticides and fungicides. Use of chemicals for pest management will leave harmful residues in soil, affects biodiversity and may leave residues in product as well.	Shoot borer: Spraying neemoil 0.5 per cent during July-October (at 21 day intervals) is effective against the shoot borer. Rhizome rot: Selection of healthy rhizomes, soil solarization and incorporation of *Trichoderma,* seed treatment and soil application of biocontrol agents like *Trichoderma* or *Pseudomonas* multiplied in suitable

		carrier media such as coir pith compost, well rotten cow dung or quality neem cake may be done at the time of sowing and at regular intervals to keep the rhizome rot disease in check. Leaf spot: To control other foliar diseases spraying of Bordeaux mixture 1% may be done restricting the quantity to 8 kg copper per hectare per annum.
Interventions for Processing, storage and transport		
Curing	Curing involves boiling of rhizome fingers (mother tubers are usually kept for seed purpose) in water. Water requirement is more in traditional method of curing and requires more fuel.	Steam boiler can be used which enable uniform cooking of rhizomes, saving the fuel and time, since this method boils higher quantity of rhizomes. Capacity of the boiler is about 250 to 270 kgs/batch and 3.5 to 4 tonnes per day of eight hours. Fuel requirements is 18-20 kgs of agricultural waste materials per batch of 250 to 270 kgs of rhizomes. The cost of the unit is approximately Rs. 1.00 lakh (2008). Boiling in perforated trough in a pan will also save water as the water can be reused.
Drying	The cooked fingers are dried in the sun by spreading them in five-seven cm thick layers on bamboo mats or drying floor. It may take 10-15 days for the rhizomes to become completely dry. Unclean drying floors and contact with moisture will develop molds and encourage pest attacks.	During night time, the rhizomes should be heaped or covered with material which provides aeration. Solar tunnel drying can be explored to avoid spoilage and maintain the quality, colour.
Polishing	The appearance is improved by smoothening and polishing the outer surface by manual or mechanical rubbing on a hard surface. The improved method is by using a hand operated barrel or drum	No environmental issues.

	mounted on a central axis, the sides of which are made of expanded metal mesh. When the drum filled with turmeric is rotated, polishing is effected by abrasion of the surface against the mesh as well as by mutual rubbing against each other as they roll inside the drum. Turmeric is also polished in power operated drums.	
Storage	The following fungicides are recommended as a pre-storage dip treatment for rhizome seeds: quinalphos at 0.075%, and mancozeb at 0.3%. The chemicals are not permitted in project as per the World Bank Safeguard Policy on Pest management. The chemicals leave residues in the product which is harmful.	Rhizomes for seed purpose are generally stored by heaping in well ventilated rooms and covered with turmeric leaves. The seed rhizomes can also be stored in pits with saw dust, sand along with leaves of *Strychnos nuxvomica*. The pits are to be covered with wooden planks with one or two openings for aeration. For preservation of seed rhizomes the material can also be stored by heaping them under the shade of trees. Heaps are covered with turmeric leaf and plastered with soil and cow dung mixture. It can be left undisturbed for 2 - 3 months until sowing. The cured produce can be stored in pits of 4 x 3 x 2 m size. Pits are dug in elevated place and dried for two days; bottom and sides of the pits are thickly lined with grass or Palmyrah mats. Subsequently cured produce is filled in pits and is covered with mats and finally with earth. The materials can be stored for one year.
Packing	Packaging is normally done in clean gunny bags and it should be polythene laminated gunny bags. For domestic markets, turmeric are packed in gunny bags and jute sacks.	No environmental issues.

Marketing opportunities for Organic Turmeric:

Organic certification of Turmeric for export:

Certification and labeling is to be done by an independent body accredited by APEDA to provide a guarantee that the production standards are met. The inspectors appointed by the certification agencies will carry out inspection of the farm operations through records maintained and by periodic site inspections. Documentation of farm activities is must for acquiring certification especially when both conventional and organic crops are raised. Group certification programmes are also done for organized group of producers and processors with similar production systems located in geographical proximity which can be utilized by APRIGP.

The following practices are mandatory for organic certification:

- For certified organic production, at least for 18 months the crop should be under orgsanic management *i.e.* only the second crop of turmeric can be sold as organic. The conversion period may be relaxed if the organic farm is being established on a land where chemicals were not previously used, provided sufficient proof of history of the area is available.
- Turmeric when grown in a mixed cultivation system, all the crops in the field should also be cultivated in organic methods of production.
- In order to avoid contamination of organically cultivated plots from neighboring non-organic farms, a suitable buffer zone of 25 to 50 ft is to be maintained. Crop grown on this buffer zone cannot be treated as organic.
- In sloppy lands adequate precaution should be taken to avoid the entry of runoff water and chemical drift from the neighboring farms. Proper soil and water conservation measures by making conservation pits in the interspaces of beds across the slope have to be followed to minimize the erosion and runoff. Water stagnation has to be avoided in the low lying fields by taking deep trenches for drainage.

Support from Spices Board:

Spices Board provides support for marketing by linking with retails marts, brand building and export promotion. Assistance will be given for developing appropriate product, packaging and compliance with other statutory requirements in force in the target market including traceability details and Bar Coding. Similarly the Board provides assistance to exporters to develop products to promote different values/applications of spices.

Sources of Support

- Department of Horticulture, Government of Andhra Pradesh
  Public Gardens, Hyderabad
  Ph.No.:23240124, 23234091, Fax.No.: 23240181
  horticulturedept@yahoo.co.in, dir_hort@ap.gov.in
- Respective Krishi Vignan Kendras (KVKs) and District Agriculture Advisory technology Centres (DAATCs) and Agriculture Technology Management Agency (ATMA)
- Spices Board (Ministry of Commerce & Industry, Govt. of India)
  'Sugandha Bhavan", N.H.By Pass, Palarivattom.P.O
  Cochin – 682025, Kerala, India
  Phone : 91-484-2333610 – 616, Fax : 91-484-2334429, 2331429
- Indian Institutue of Spices research
  Chelavoor, Kozhikode, Kerala, 673012

4. Cashew:

Overview of Cashew in Andhra Pradesh (erstwhile):

Andhra Pradesh has an area about 85,686 hectares under cashew with annual production of 58,26,635 M.T of raw nuts[11]. Its contribution to India's production is 16.14 per cent per annum[12]. Important cashew growing districts in the state are Guntur, Krishna, East Godavari, West Godavari, Srikakulam, Vishakhapatnam, Nellore and Prakasam. The state productivity is 544 kgs/ha against a national average of 695 kg/Ha.[13]

Interventions in Cashew nut in APRIGP:

APRIGP will target 52,500 cashew producers to produce 32,523 tons of cashew nut through sustainable production practices. The proposed interventions are productivity enhancement, value addition to cashew apple, intercropping, certification and aggregation for marketing. The interventions will be in 5 districts – Srikakulam, East Godavari, West Godavari, Vizianagaram and Visakhapatnam. An area of 59785 acres will be covered in 45 mandals.

Potential Environmental issues and Environment friendly alternatives in the Cashew nut value chain:

Component	Possible Issue	Intervention, Best practice
Interventions for Productivity Enhancement		
Varietal selection	Varieties not suitable to local environmental conditions may not respond well and increase cost of pest and disease management.	The recommended varieties for the state of Andhra Pradesh are: BPP-4 (progeny EPM 9/8) BPP-6 (progeny T No.56), BPP-8 (T No.1xT No.39), VRI-2 (M44/3) and Vengurla 4.
Cropping system - Intercropping	Mono cropping may deplete nutrients as cashew is usually grown in low nutrient soils and in sloppy lands soil erosion might occur.	In forest plantations of cashew legumes like ground nut, horse gram, cowpea or turmeric can be raised as inter crops during first 3 years as they add nutrient value besides providing additional income. Horticulture crops like pineapple, custard apple and lemon can also be raised after checking the suitability of soil and irrigation facilities. Casuarina can also be planted as intercrop at a spacing of 1.5m x 1.5m. In the west Godavari district of Andhra Pradesh, cashew is grown in combination with casuarina and

[11] Area and Production of Major Horticultural Crops 2012-13, viewed at http://aphorticulture.nic.in/area_and_production-2012-13.htm on 14th February 2014.

[12] Cashew nut, viewed at http://aphorticulture.nic.in/Cashew.htm on 12th February 2014.

[13] http://dccd.gov.in/stat.htm viewe don 25th Feburary 2014.

		coconut with good returns. Intercropping also reduces has reduced weeding period of cashew by about 50 per cent when compared to sole cashew crop[14].
Irrigation	Intensive irrigation is required in summer with stand scorching effect during initial stages which might be a problem in water scarce areas. Excess irrigation leads to water logging in low lying areas.	Mulching the basin with dry leaves will conserve moisture, reduce the requirement of water and will suppress weed growth in basins as well. Proper drainage is essential in low lying areas. Soil moisture conservation activities like construction of conservation furrows, trenches, contour bunds, half moon circles can help in water harvesting leading to higher production. After floods or heavy rains the excess water should be drained and crop sprayed with 1% KNO3 or Urea 2% solution 2-3 times. Broken and damaged branches may be pruned and applied with Bordeaux paste
Manures and fertilizers	Fertilizers applied without soil testing will leads to leaching and wastage of nutrients, excess input cost or less yield.	Soil testing based fertilizer application is recommended. To improve the fertilizer efficiency fertiliser should be applied in trenches of 10-15 cm deep dug about 100-150 cm away from the trunk. Farm yard manure or compost of 30 to 35 kg/adult tree or 20 of poultry manure per adult tree gave better results. Green manuring crops like sun hemp can be grown during rainy season to improve the soil fertility. The root system is generally confined to a radius of 2 m and a depth of 1 m. In order to achieve maximum

[14] Sustainable Cashew Production in Cuddalore District – A case study, Haripriya.S Assistant Professor (Horticulture), Tamil Nadu Agricultural University, Coimbatore, viewed at http://agropedia.iitk.ac.in/content/sustainable-cashew-production-cuddalore-district-%E2%80%93-case-study on 12th February 2014.

		utilization of applied nutrients, fertilizer practices can be confined to this part of the root zone. In the eastern coastal areas cashew is grown mostly on sloping land. A considerable amount of nutrient leaching and soil erosion are common in such situations. Cashew farmers are advised to construct terraces and contour pits and drains to conserve runoff water, check erosion and to drain excess water.
Pest management	The chemicals recommended for cashew pest control fall under class Ia, Ib and II which cannot be used in the project.	Stem borer: To control stem borer chisel out the damaged area of the tree and swab that port with neem oil (50 ml neem oil+1 litre water+5ml tepol or 5gm soap) to the tree trunk upto a height of 1 meter during April-may. Remove and destrpy dead and decaying plant parts to ensure sanitation[15]. Tea Mosquito Bug: 2% Pongam Seed Kernal Extract spary is found effective[16]
Interventions in processing, storage and transport		
Drying / Roasting	The traditional practice in south India is to spread the nuts out on flat rocks in the sun, so as to allow them to dry until the shell becomes brittle. The kernel could then be removed from the shell by striking the nut with a wooden batten to split the shell along the natural line of cleavage. Open roasting: The roasting is done in an open circular mild steel dish, measuring 600 to 675 mm (2 to 2.5 feet) in diameter, supported over an open fire. Between 1 and 1.5 kg of raw nuts are placed on to the heated pan at a time. The nuts are heated	Rotating the drum with bare hands might cause burns, and shelling might cause injury to hands. Power drove can be fitted for rotating the drum. Inhaling the smoke is harmful for the health, precautions to be taken like using masks.

[15] IPM – Integrated Pest Management package for Cashew, viewed on http://ppqs.gov.in/pack/ipmpackage/cashew.pdf on 11th February 2014.
[16] http://www.inflibnet.ac.in/ojs/index.php/KJAS/article/viewFile/1539/1367 viewed on 12th February 2014.

	on the pan, with constant stirring, in order to prevent burning. As the nuts heat up, the Cashew Nut Shell Liquid (CNSL) is exuded onto the pan and eventually ignites, producing clouds of thick black smoke. After heating and burning for about two minutes (judged by experience) the pan is dowsed in water and the nuts are thrown off and allowed to cool, during which the shells become brittle and can be readily removed from the nut. Drum roasting: In this process the nuts (without any conditioning) are fed into a rotating drum, which is heated initially to red hot sufficiently to allow the shell portion of the nut to ignite and burn. Once ignition starts no further heating is necessary and the drum maintains the temperature on its own because of the burning of oil, which oozes out of the nuts. The shell becomes very brittle. The roasting generally takes about 3-5 minutes and the drum is rotated by hand. The roasted nuts, which are still burning are removed from the discharge end and immediately covered by ash to absorb the oil that is found on the surface. Kernels obtained in this process have a better color than in the other processes. Steam Roasting: In this method, the raw cashew nuts are treated in a cooker filled with steam at 100-110 Kg/Cm2 for about 15 minutes. The treated raw nuts are spread out on the floor for cooling and then sent to the shelling section the next day. The turnout and appearance of	No environmental issues in this method.

	whole kernels from raw nuts treated in this method are said to be better than in any other method. The cashew nut shell liquid (CNSL) obtained in this method from the shells is very clear and command a premium price. About 75% of the CNSL can be extracted from the shells.	
Shelling	Shelling is the removal of dry roasted shell. By striking the head of the nut, the natural line of cleavage is broken. It is important when shelling the nut that the kernal is not broken as whole nuts command a higher price in the market. This operation is done manually mostly by skilled women. Wood ash is applied to the hands to prevent damage to the hands and kernel.	Precautions to avoid injuries and keeping first aid kit available. It is advised to wear gloves as a preventive measure depending on convenience.
Storage	Organo halogen taint gives off flavor to cashew nuts if not stored and transported properly. This usually happened due to chemicals, fertilsiers or irrigation water with high chlorine.	Drying yards should not be cleaned with halogen containing cleaning agents (such a bleaching powder etc.). Farmers should be advised properly on the standard storage practices for nuts and the dangers of using halogen based chemicals and fertilizers. The separated nuts are dried for 2-3 days to bring the moisture content down to 8 % and stored in tins or gunny bags. Should be stored only in jute bags which are not treated chemically. Avoid plastic bags. Chemicals / pesticides / weedicides / fertilizers should not be stored along with raw nuts. Vehicles used for transport for chemicals should not be used for transport of nuts. The vehicle should be cleaned and dried before transport
Waste	From cashew apple drinks can be	The left over fruit pulp should be

management	made (non alcoholic). Jam, chutney and pickles are also prepared. The left over pulp is disposed openly leading breeding of flies etc.	composted.

Marketing opportunities for Organic Cashew:

- The Cashew Export Promotion Council of India (CEPCI)[17] was established by the Government of India in the year 1955, with the active cooperation of the cashew industry with the object of promoting exports of cashew kernels and cashew nut shell liquid from India. The Council provides the necessary institutional frame-work for performing the different functions that serve to intensify and promote exports of cashew kernels and cashew nut shell liquid. The Council provides the necessary liaison for bringing together foreign importers with exporters of cashew kernels. The enquiries received from the foreign importers are circulated amongst Council members. The Council also extends its support in settling complaints amicably in the matter of exports/imports either on account of quality and /or variation in fulfillment of contractual obligations.

The Schemes by CEPCI for 12th 5 year plan are:

1. Process Mechanization and automation of Cashew Processing units
2. Quality upgradation and Food Safety Certifications:
   This includes the following support:
   1. Certification Consultancy charges
   2. Certification charges
   3. Certification Audit charges
   4. Safety equipments
   5. Any other relevant item directly related to Quality control / Food Safety Certifications

- Marketing linkages can be explored with organic commodity marketing organizations with presence in A.P. Some examples are - 24 letter organic mantra, Morarka organic , Suminter India organic etc. Also marketing through commodity exchanges like NCDEX and NSE can also be explored.

  NCDEX Spot Exchange Limited
  Akruti Corporate Park,1st Floor,
  Near G.E.Garden , L.B.S. Marg,
  Kanjurmarg (West), Mumbai - 400 079.
  Tel : (+91-22) - 66406789
  Fax : (+91-22) - 66406891
  E-mail: askus@ncdexspot.com

Sources of Support:

- Directorate of Cashew Research,
  Post Darbe, Puttur-574202, D.K., Karnataka - 574202.
  dircajures@gmail.com, Phone: 08251 - 231530, 230902, 236490
- Cashew Research Station, Bapatla-522 101
  Guntur Phone:08643-225304

[17] The Cashew Export Promotion Council of India, viewed at http://www.cashewindia.org/php/cepcContents.php?CatID=2 on 25th February 2014.

- Respective Krishi Vignan Kendras (KVKs) and District Agriculture Advisory technology Centres (DAATCs) and Agriculture Technology Management Agency (ATMA).

5. Coffee:

Overview of Coffee in Andhra Pradesh:

Coffee is grown in Araku valley of North-Western Andhra Pradesh within the Eastern Ghats in the district of Visakhapatnam forms a non-traditional coffee growing area. Araku coffee is of Arabica type and is grown at elevations ranging from 900 to 1100 meters above sea level. The main intercrops are pepper *(Piper nigrum)*, jackfruit *(Artocarpus heterophyllus)* and mango. Araku Coffee is grown in an area covering some 80,000 acres, mainly under private tribal holdings and the state government's Andhra Pradesh Forest Development Corporation. The agency (tribal) area is largely populated by various indigenous tribal people of whom about 60,000 benefit from the introduction coffee cultivation. Many of these tribal people made a livelihood through shifting cultivation which destroyed large areas of forests prior to coffee cultivation.

Coffee promotion in Paderu:

Paderu in Vishakapatnam District is a tribal belt with annual rainfall of 1250 mm at an altitude of 3650 feet MSL. Warm weather with high rainfall for a period of 6 months is congenial for coffee plantations. The rich forest cover in the tribal area dwindled due to podu cultivation and the poor tribal farmers with primitive cultivation and low productivity force the farmers to work as daily labourers. Coffee plantation programme in ITDA was initiated in 1985 with the help of Coffee Board and of late pepper as an intercrop is yielding good returns to the farmers with very little investment. Organic Coffee of Araku in Paderu has good market potential with brand name "Araku Emerald". Every year about 10,000 acres of new plantations are raised by ITDA which is low compared to the demand. Further the old low yielding plantations need to be replanted. To encourage coffee cultivation with pepper as intercrop tribal farmers are provided with 100% assistance under TRICOR and National Rural Employment Guarantee scheme (NREGS). Para workers/coffee extension workers are engaged in field demonstrations who are trained by coffee board[18].

Interventions in Coffee in APRIGP:

APRIGP targets 56729 coffee producers who will produce 6700 tons of coffee using sustainable practices. The interventions include introduction of pepper plantations for shade, productivity enhancement of coffee and pepper, certification, value addition and aggregation and marketing. The interventions will be in Visakhapatnam district spread across 4 mandals – Paderu, G. Madugula, Chintapalli and G.K. Veedhi. The total acreage will be 59738 acres.

Potential Environmental issues and Environment friendly alternatives in the Coffee value chain:

Component	Possible Issue	Intervention, Best practice
Interventions for Productivity Enhancement		
Planting material	Varieties not suitable to local environmental conditions may not respond well and increase cost of pest and disease management and have impact on local biodiversity.	Arabica: Planting material should be selected according to its suitability to local conditions and natural habitats (selection 4, selection 6, selection 8).It should be grown from seeds obtained from known sources where certified

[18]

		seeds should be preferred.
Nutrient management	As the coffee is usually promoted in forest lands in agency areas application of chemical nutrients would result in chemical residues in soil which will have an impact on eco system.	For soil nutrient management chopping and incorporation of crop residues as well as organic manure or compost/vermicompost can be followed to help improve soil fertility by increasing organic matter content, improving nutrient and water retention and reducing erosion. Soil chemical, biological composition analysis and leaf analysis should be carried out to understand nutrient availability to plan organic manure application. While using crop residues ensure that infected materials are removed to check the spread of pests and diseases.
Pest Management	Use of chemicals for pest and disease control would result in Negative impact on flora and fauna and leave chemical residues in soil which will have an impact on eco system.	The use of clean (pest and disease free) seed at planting is an important strategy for controlling seed borne diseases, such as coffee wilt disease. Seed from disease free sources should always be used. Pruning of coffee trees increases the vigour of the plant by cutting away unproductive vegetation and opening up the leaf canopy. This allows more light to penetrate and air to circulate, thus reducing the humidity and temperature. These conditions are less favourable to many pests and diseases. Maintaining optimum shade reduces stem borer attack. In case of stem borer attack the infested plants should be uprooted and burned. Phromone(2-hydroxy-3- decanone @ 30 per ha)traps and sticky traps can also be used to control stem borer. Too less canopy increased stem borer incidence. Scrubbing the bark deters egg laying. For control of coffee berry borers all the berries on the ground after harvest

		should be collected and destroyed to avoid infestation in the next crop. Coffee rust to be controlled by 0.5% Bordeaux mixture.[19]
Water conservation	As coffee is grown usually in slopy lands irrigation leads to soil erosion and wastage of water.	Prevent erosion as well as the deterioration of the soil by biological and mechanical control (e.g. use of terraces, erosion barriers, rain basins etc).
Shade trees		Make use of shade trees of different, preferably native species that are compatible with coffee production. Eg: Pine apple, Mango, Pepper which can give additional income also.
Processing		
<u>Waste Management in processing:</u> Wet processing- Involves removing the skin, pulp, fermentation and washing.	Wet processing involves the removal of the outer red skin (exocarp) and the white fleshy pulp (mesocarp) and the separation of the pulp and beans. Drum or disk pulpers are used. For small-scale units, the cherries can be pulped in a pestle and mortar, this is very labour intensive. Fermentation is done by soaking in water until the mucilage breaks down. After fermentation the beans are to be washed quickly to avoid off flavor. To prevent cracking immediately the beans should be dried to 10% moisture content. Improper drying causes cracks in beans. Air pollution is caused by hot air generation (by Diesel burning), cleaning of beans, D.G. sets and boilers	 Cemented drying platform is required for uniform drying. For air pollution control cyclones/ bag filters can be provided.

[19]Sustainable Coffee Cultivation in India: Challenges and Management Venkatesha, M.G, Department of Zoology, Bangalore University, viewed ta http://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=8&cad=rja&ved=0CFwQFjAH&url=http%3A%2F%2Fwww.researchgate.net%2Fpublication%2F230792824_Sustainable_coffee_cultivation_in_India_Challenges_and_management%2Ffile%2F60b7d51aed03476712.pdf&ei=Z8H9UszwCI71iQfzsoGYDw&usg=AFQjCNFLlY2QdZ9--KqXM53vvrY99un94g&sig2=fbABZ8O-703pB3VhfNPJpg&bvm=bv.61190604,d.aGc, viewed on 14th February 2014.

	For wet processing pulper and aqua washer are used which need water – about 15000 liters per ton of coffee bean.	Use of modern aqua pulper reduces water requirement to one third.
	The waste water from the process which is acidic in nature and unsuitable for irrigation should be treated with neutralization and anaerobic and aerobic treatment. This waste water when released untreated into water bodies it will increase Biological Oxygen Demand (BOD).	State Pollution Control Boards (SPCBs), apply general standard for discharge of wastewater to contain the pollution of perennial water sources in accordance with the Water (Prevention & Control of Pollution) Act (1974). The coffee processing industries are required to obtain permission from SPCBs for wet processing of coffee by giving an undertaking that the effluents will be treated to the standards prescribed, or stored within their premises. An Effluent Treatment Plant should be planned with help of PCB. Small growers of less than 25 ha. Can store waste water in polythene lined lagoons for solar evaporation. As waste water is high in organic content it can also be used for generating biogas through a bio reactor. Installing a bio reactor is another alternative to ETP which not only reduces BoD and COD but releases biogas that can be used for electricity generation. The model Developed by Centre for Sustainable technologies, Indian Institute of Science (IISc).
	Open disposal of left over skin and pulp will pollute the soil, gives strong smell and attracts flies etc. for breeding.	Cherry husk can be used for fuel briquetting. Skin and pulp can be used as mulch or compost. The treated water if it is used for irrigation should be diluted 5 times

		with water. The sludge could be mixed with compost and used as organic manure. The small to medium growers can be provided provide primary treatment comprising equalization followed by neutralization for wet coffee processing wastewaters prior to its storage.
Dry processing	Does not require water, no pollution. Coffee cherries are dried on cement platforms and peeled of parchment using peeler machines. The coffee cherries are dried immediately after harvest. This is usually sun drying on a clean dry floor or on mats. The bed depth should be less than 40mm and the cherries should be raked frequently to prevent fermentation or discoloration. Contamination with dirt and dust is the problem. Sometimes unexpected rain leads to mold.	Solar driers – cabinet or excel solar dries can be used to avoid contamination with dust and rain. It will also lead to uniform drying and better quality.
Hulling and cleaning	After drying the parchment around the coffee bean is removed by hand or pestle and mortor and cleaned by winnowing. Open disposal of waste affects environment.	Waste can be composted and used as manure.
Roasting	Roasting is done using roasting machines or roasting pans where sand is also used for uniform heat.	Energy efficient roasters can be used.
Grinding	Manual and motorised grinding mills are used. Lack of ventilation poses health risks.	Grinding mill to be placed in well ventilated place because of dust.

Marketing Interventions:

Organic certification:

Key industry level initiatives on environmental governance and sustainable production certification include - Euro-retailer Produce working group (EUREP) protocols for Good Agriculture Practice (also called Global GAP) used by Utz certification, Common code for Coffee Certification (4C), Rainforest Alliance, Fair Trade Labelling, etc. (Auld, 2010). Another related development is the emergence of multi-sectoral partnerships for sustainable coffee value chains where in state, market and civil society

collaborate and support sustainable coffee production and marketing by small growers. Market players like Starbucks, Kraft foods, ECOM are part of such partnerships. Similarly INGOs like Oxfam and Solidaridad are engaged with these initiatives as facilitators. This new way of working emerged as a response to affect and improve the production stage of the value chain. The main approach to this work includes promoting sustainable production through capacity development of producer groups and their co-operative capacity, stabilising producer environment and creation of market access. While this approach is gaining currency, they need to gain confidence of small producers in India.

Nandi foundation has supported organic production and marketing with help of SRTT by facilitating Fair trade certification being provided by the Fair Trade Labelling Organisations based in Germany. The tribal farmers of Araku valley are registered as the small and marginal tribal farmers' 'Mutually Aided Cooperative Society' (MACS).

Sources of Technical Support:

- Coffee Board, Government of India
  Ministry of Commerce and Industry
  Dr Ambedkar Road, Vasanth Nagar, Bangalore, Karnataka 560001
  Phone: +91-80- 22266991 - 994; Fax:+91-80-22255557
- Regional Coffee Research Station (RCRS),
  R.V. Nagar, Visakhapatnam.
- Central Coffee Research Institute,
  Coffee Research Station,
  Coffee Board,
  P.B. No.43, Prabhu Street,
  Chickmagalur
  Pin - 577 117.

6. Pine Apple:

Overview of Pineapple in Andhra Pradesh (erstwhile):

Area under pine apple in Andhra Pradesh is 80,000 ha with a productivity of 15.20 MT (2007-08) against a national average of 14.90 MT[20] (2012-13).

Interventions in Pineapple in APRIGP:

APRIGP targets 7500 pine apple producers who will grow 20,000 tons through sustainable agricultural practices. The intervention include productivity enhancement, value addition, certification and marketing. The geographical spread of this intervention will be Seethampeta, Chintapalli and Paderu mandals of Visakhapatnam district. Total area under plantation will be 10,000 acres.

Potential Environmental issues and Environment friendly alternatives in the Pine apple value chain:

Component	Possible Issue	Intervention, Best practice
Interventions for Productivity Enhancement		
Varietal selection	Varieties not suitable to local environmental conditions may not respond well and increase cost of pest and disease management.	Kew (canning variety), Queen (table variety) and Mauritius (table mid season variety).
Cropping systems	Mono cropping encourages weeds. Seed treatment with chemicals under class Ia, Ib and II is not allowed.	Can also be grown in intercropping systems with cauliflower, cabbage, yam, chillies, sweet potato, black gram and green gram. Seed suckers can be treated with *jeevamruth, panchagavya.*
Nutrient management	Fertilizers applied without soil testing will lead to leaching of nutrients, excess input cost or less yield. Application of chemical fertilizer will lead to chemical residues in soil and affect microbial activity.	FYM, Vermicompsot or NADEP can be used for meeting nutrient requirement after soil testing. Also panchakavya and vermiwash improves soil microbial activities. Manure should be applied around the plant and mixed by hoeing. Green manure crops can be grown in between rows and incorporated.
Irrigation	Water conservation is important in water scarce areas and season	Drip irrigation can be adopted to maintain moisture in summer months.
Pest management	Pine apples are infested by variety of pests like mealy bugs, scale insects, thrips, fruit borers, beetles, termites, mites etc.	Mealy bugs: • Selection of healthy suckers to avoid mealy bug attack

[20]Pineapple, viewed at http://agriexchange.apeda.gov.in/Market%20Profile/MOA/Product/Pineapple.pdf on 17th February 2014. (source: Indian Horticulture data base 2013 - http://nhb.gov.in/area-pro/Indian%20Horticulture%202013.pdf).

	Rodents attack ripe fruits. Stem rot and root rot.	• Biological control agents like *Cryptoleamus montrouzieri* are introduced to control mealy bugs. • Mealy bugs are spread through ants, by destroying ant the bugs can be controlled. • Also removal of alternate hosts guava, custard apple and hibiscus is important. Scale insects: • Scale insects are also controlled by cochineal insects • Thrips infest during drought and timely irrigation can solve the problem and mulching reduces thrip attack • Spray of garlic, pepper will control thrips. • Sugarcane midget: *Bacillus thuringiensis* can be used Pine apple fruit fly: • Plucking of infested fruits, clearing the fermented fruits, and traps containing fermented fruits covered with an inverted funnel can be used to collect and destroy. • Cow dung urine spray and 2% neem oil spray with detergent at regular intervals repels pests • Rodents attack can be controlled by spreading pieces of colocasia in fields. • Stem and root rot are controlled by adequate drainage, using healthy suckers and treating suckers with cow dung, urine solution.
Interventions for storage, processing and transport		
Post Harvest Management	Using chemical in storage will lead to harmful residues in the fruit.	All the leaves should be removed and dried in shade before storage Use ecofriendly material like bamboo baskets for transport Storage space should be adequately ventilated Mechanical traps to be used for

		control of storage pests (rodents) Organic fruits should not be stored along with inorganic fruits or any other products. Dry fruits, products can be stored pt 1 year in dark, cool and low humid conditions
Processing and drying	The fruits are washed, cut into pieces and added with sugar; jam is also made by making pulp and adding sugar and heating. Citric acid and other spices are added as required. Food contamination is possible during processing. Open drying contaminates the product	Equipment (tubs, knives etc.), as well as working and drying surfaces (racks, mats etc.) and preparing and storage rooms, should be cleaned regularly. Personnel should be healthy, and have the possibility to wash themselves, or at least their hands (washrooms, toilets) and wear clean, washable garments. Water used for cleansing purposes must be free from faeces and other contaminants. Animals or animal faeces must not come into contact with the fruits. If the fruits are to be dried in the open, then fences must be erected to guard the racks against birds and nearby animals. Solar dries can be promoted for clean drying. During and after drying, the dried fruits are not permitted to be treated with methyl bromide, ethylene oxide, sulphur oxides or with ionising radiation.
Waste management	The fruit peels skin etc. attracts flies due to fermenting nature.	The left over pulp, peels etc. should be composted or ground and fed to cattle.

Marketing opportunities for Organic Pine apple:

Pine apple has good export potential with prescribed standards of cultivation and processing which can be explored.

Sources of technical Support:

- Kerala Agriculture University, Vellanikkara, Thrissur, Kerala-680654.
- College of Horticulture, Vellanikkara, Thrissur, Kerala-680654.
- University of Agricultural Sciences, GKVK, Bangalore-560065, Karnataka.
- Indian Institute of Horticultural Research, Hassaraghatta, Lake Post, Bangalore-560089, Karnataka.

7. Dairy

Overview of Dairy Scenario in Andhra Pradesh (erstwhile):

Andhra Pradesh stands number one in the country in sheep population, meat production (556000 MTs), poultry population and per capita availability of eggs, according to 2007 livestock census. The state also stands second in buffalo population, third in total livestock population and fourth in milk production (89, 25,000 MTs) in the country. It is considered that sustained growth in the livestock sector has a significant beneficial impact in generating employment and reducing rural poverty. Trends in livestock population: According to livestock census-2007 the total livestock population of Andhra Pradesh is 601.75 lakhs, excluding poultry. Among these 244.94 lakhs are cattle and buffaloes (total bovines), 255.39 are sheep and 96.26 lakhs are goats. Significant growth in the cattle, buffalo, sheep and goat population is registered between the years 2003 and 2007. During this period, cattle population increased by 19.09% and buffalo population increased by 23.25%. The decline in the number of male buffaloes and a rise in the number of male cattle and cows indicate that the farmers are raising cattle for both milk and draught purpose where as buffaloes are maintained for milk production in the state[21].

Interventions in Dairy Sector under APRIGP:

APRIGP targets milk producers of 20 mandals of 4 districts to improve milk yield through best livestock management practices. The interventions will include induction of high yielding animals, capacity building, fodder requirements etc.

Potential Environmental issues and Environment friendly alternatives in the Dairy value chain:

Component	Possible Issue	Intervention, Best practice
Interventions for Resource management and Productivity Enhancement		
Breed selection	Selection of breeds that can not adapt to the local climatic conditions will lead to loss of cattle or results in low productivity and health issues.	Selection of breeds suitable to local climatic conditions and up gradation with the improved breeds suitable or acclimatized to local climate should be done under technical guidance. The suggestions on local suitability of cattle, sheep and goat is given in *Annexe 2 of this annexure 6.*
Open grazing	Even though open grazing is a traditional practice and recommended for better health conditions of the animals, over grazing will lead to loss of pasture lands due to reduced regeneration capacity as a result of continuous grazing. The local biodiversity is also affected and soil becomes susceptible to erosion as the green cover is removed.	It is ideal to combine stall feeding with grazing for a limited time. The grazing should be done in rotational manner. Grazing lands can be improved by reseeding and manuring collectively by cooperatives and a system of rotational grazing can be designed. This can be done in convergence with programmes like NREGS.

[21] Livestock development in Andhra Pradesh, Status and Potential, Centre for Economic and Social Studies, viewed at http://www.cess.ac.in/cesshome/wp/RULNR-working-paper-16.pdf on 2nd July 2014.

	This will also increase the strain on the animal to walk longer distances in search of fodder affecting the productivity.	
Fodder cultivation	Exclusive dependence of fodder varieties like APBN/CO4 will not supply all vital nutrients to the cattle, besides it depletes soil nutrients and water resources as the water requirement for such crops is high.	Green fodder should comprise of proper cereal grass and legume mix to provide complete nutrition. The fodder plots should also accommodate legume crops like lucerne, berseem, cow pea, stylo and fodder trees like sesbania. This provides proper ration to the animals as well as maintains soil fertility. Azolla cultivation can also supplement the protein requirement. Use of chemical should be avoided/ Minimized.
Chemical fertilisation	Over use of chemical fertilizers or use of pesticides will lead to biomagnifications and affect the quality of milk.	
Tackling the fodder scarcity	Fodder scarcity in dry seasons or drought periods will create stress on available vegetation like trees and insufficient fodder affects animal health.	Individual /Community fodder banks are to be maintained by the groups by procuring crop residues and storage, and maintaining supplementary feed units.
Stall feeding with green fodder	Stall feeding of harvested green fodder as it is will lead to wastage of fodder and feeding efficiency of animal is decreased.	Green fodder cut into small bits using chaff cutter or suitable tools will improve the feeding efficiency of the animal digestibility and reduce the wastage.
Shed spacing, sanitation and waste management	Congested and unclean sheds (without proper facilities for draining the urine etc, lack ventilation etc.) will lead to outbreak and spread of diseases.	The sheds should be clean and should provide sufficient ventilation, enough space for the animal to move freely (recommended space is 4 sq mt per animals). There should be arrangements like slop and a pit for collection of urine which can be put to alternate uses like panchakavya preparation or can be added to manure pits). In general sheds are constructed outside the village required ventilation
	Open disposal of the shed cleanings	The daily sweepings of the shed

	– fodder wastage, manure, urine etc. will create unhygienic environment in the surroundings.	should be composted in a pit. However pit methods can be avoided in areas with high water table but the heap should be properly covered with palm leaves or gunny sacks to avoid leaching. The households having 2 cattle can plan for biogas plants. Composting the slurry provides enriched compost or vermicompost.
Interventions for improving milk yield	Injecting hormonal substances like oxytocin under misconception that it increases milk yield will have negative impact on animal health and will make the animal go dry early.	Practice of injecting harmones should be strictly avoided.
Milking	Unhygenic milking practices – milking without washing hands, not addressing any injuries or disease of the animal will contaminate the milk	Beneficiaries should be trained on hygienic milking practices.
Open disposal of carcasses	The dead bodies of calves, or small ruminants that are dead due to epidemics will further spread the infection.	The carcasses should be properly buried or burned, after bio security measures
Environment Issues and Measures in Bulk Milk Cooling Units		
Cleaning and maintenance of equipment	The chemical and acids used in cleaning the unit pollute the soil and water when discharged without being treated	Waste water after cleaning should not be released into the gutters leading to agriculture fields, or to the open area nearby. Drying ponds (with cement lining) can be constructed where water can be evaporated and residue can be collected and disposed of safely.

Sources of Technical Support:
Respective Animal Husbandry Departments and Livestock research Stations in the districts

Directorate of Animal Husbandry
Shanthi Nagar, Masab Tank
Hyderabad – 45
Ph no – 040 – 23391335, 23316855
Fax – 040 – 23312431, E mail – ahitc@hotmail.com
Regional Station for Forage Production and Demonstration
Pahadi Sharif, Hyderabad – 500 005.

8. Poultry

Overview of Poultry Scenario in Andhra Pradesh (erstwhile):

As per 18th Quinquennial Livestock Census-2007 Andhra Pradesh stands first in poultry (1239.85 lakhs). The state has famous Aseel breed of poultry which is principle source for development of broiler breeds in the world. The poultry population increased by 23.27% between 2003 to 2007.The Egg Production in the State under report is 183447.156 Lakh Nos. This constitutes 32.97% of the total egg production in the country (556378 Lakh Nos) i.e. every third egg produced in the country comes from Andhra Pradesh. Thus the State can be called "egg basket" of the country. The state is maintaining its first position in Egg production in the country. Eggs from Desi fowls / Backyard poultry constitute 6.43% (11794.009 Lakh Nos) and Improved / Commercial Layers 93.57% (171653.147 Lakh Nos) among total Eggs production. Out of the total egg laying poultry, Desi birds contribute to 23% and commercial poultry to 77%. Out of estimated number of layers 76.21% were improved birds and 23.79 % were Desi birds.
The region wise contribution of egg production is (51.16%) in Coastal Andhra region, (8.22%) in Rayalaseema region and (40.62 %) in Telangana region. The predominant Egg producing Districts in the State are East Godavari, West Godavari, Chittoor, Krishna, Guntur and Visakhapatnam Districts[22].

Interventions in Poultry Sector under APRIGP:

APRIGP is planning to reach poultry producers to produce quality chicken meat and eggs through best poultry management practices. The key interventions include introduction of dual purpose birds, improving access to better veterinary services, access to low cost inputs, convergence with suppliers and marketing tie ups. Area of operation include 78 mandals in 11 districts.

Potential Environmental issues and Environment friendly alternatives in the Poultry value chain:

Component	Possible Issue	Intervention, Best practice
Interventions for Resource management and Productivity Enhancement		
Location of the Units	Location of the units near residential areas lead to noise pollution and offensive smell. Location of Units near highways causes stress and disturbance to the birds.	It is advisable to locate the units away (100 mts) from the residential areas and highways.
Housing the birds	Over crowding the birds in less space will have an impact on health of the birds – leads to quick spread of diseases and less productivity.	Follow the recommended spacing as indicated below:

[22] Integrated Sample Survey Report, Andhra Pradesh 2008-09, 2009-10, viewed at http://ahfd.ap.nic.in/ISSSR0910.pdf on 12th February 2014.

<table>
<tr><td></td><td></td><td><table>
<tr><th>Age (weeks)</th><th>Layers (cm^2)</th><th>Broilers (cm^2)</th></tr>
<tr><td>0-8</td><td>700</td><td>700</td></tr>
<tr><td>9-12</td><td>950</td><td>950</td></tr>
<tr><td>13-20</td><td>1900</td><td>2350</td></tr>
<tr><td>21 and above</td><td>2300-2800</td><td>2800-3700</td></tr>
</table></td></tr>
<tr><td>Shed cleaning and disposal of waste</td><td>Open disposal of manure leads to contamination of surrounding s and affects the manorial quality</td><td>Manure should be stored in a pit or heap lined with bricks to avoid runoff during rainy seasons.</td></tr>
<tr><td>Disposal of dead birds</td><td>Open disposal of dead birds leads to spread of diseases and attract dogs etc.</td><td>Dead bird should be disposed by burning/burying method. And it should be done at least 100 m away from the land.</td></tr>
</table>

9. Small Ruminants

Overview of Small Ruminants Scenario in Andhra Pradesh (erstwhile):

The sheep and goat population of Andhra Pradesh is 255.39 and 96.26 lakhs respectively. During the period from 2003 to 2007, 18th Quinquennial Livestock Census the Sheep and Goat population increased by 21.53% and 49.77% respectively. The prevalence of breeds in the state is as follows - sheep 26.72 % were SPS Nellore Breed, 17.69% were of Bellary Breed and 55.59% were of Deccani Breed. The Meat Production in the State under report is 603577.417 thousand Kgs. This constitutes 15.80% of the total meat production in the country (3822 thousand MTs). The state stands first position in Meat production in the country. The predominant meat producing Districts in the State are Krishna, Chittoor and Ananthapur districts[23].

Interventions in Small Ruminant Sector under APRIGP:

APRIGP targets goat and sheep producers to produce quality meat by adopting better management practices. The objective is to improve income to 20,000 per producer per annum. The key interventions proposed include induction of small ruminants, increasing productivity of animals by adopting better management practices and access to veterinary services and establishing marketing channels. The project will cover producers in 12 districts.

Potential Environmental issues and Environment friendly alternatives in the Small Ruminant value chain:

Component	Possible Issue	Intervention, Best practice
Interventions for Resource management and Productivity Enhancement		
Breed selection	Selection of breeds that cannot adapt to the local climatic conditions will lead to loss of animals or results in low productivity and health issues.	Selection of breeds suitable to local climatic conditions and up gradation with the improved breeds suitable or acclimatized to local climate should be done under technical guidance. The suggestions on local suitability of, sheep and goat is give in *Annexe 2 of this Annexure 6.*
Grazing	Continuous over grazing will lead to degradation of grazing lands. In case of sheep as they graze close to the ground surface vegetation is removed exposing the soil for erosion.	Growing fodder trees, regulated grazing and stall feeding (partly or completely) will reduce pressure on grazing lands.
Cutting large branches from trees.	Regeneration of the trees will be affected if lopping is done extensively.	Only small twigs should be extracted, fodder trees can be grown in house premises as well.
Shed spacing	Congested, less ventilated sheds will lead to quick spread of diseases	The sheds must have sufficient space and well ventilated and offer

[23] Integrated Sample Survey Report, Andhra Pradesh 2008-09, 2009-10, viewed at http://ahfd.ap.nic.in/ISSSR0910.pdf on 12th February 2014.

	and affects animal health due to less scope for movement.	protection from heat, rain etc.
Stall feeding	Stall feeding with green fodder without chopping may lead to wastage.	Fodder should be properly chopped before feeding.
Shed cleaning and waste management	Open disposal of shed cleanings and feed waste create unhygienic conditions and leads to loss of manorial value	Wastes should be composted as pit, or heap covered with leaves and lined with bricks to avoid leaching or evaporation losses.

10. Fisheries

Overview of Fisheries Scenario in Andhra Pradesh (erstwhile):

The length of coastline in Andhra Pradesh is 974 kms with 353 fish landing centres and 555 fishing villages. Fisher folk population in the state is 6,05,428 and number of fishermen families 1,63,427. Inland fisheries cover 8.11 lakh ha of water bodies, and 11,514 kms of rivers and canals and 2.34 lakh ha of reservoirs. Fish production in Andhra Pradesh is 1808.08 tons (1393.73 inland and 414.35 marine)[24]. The growth rate is 13.16% in inland fisheries and -18.86 in marine fisheries[25]. The state contributes approximately 35% to the Indian fish export. In fresh water fisheries Present estimates show that AP produces on an average 3 tons per ha fish while the potential is 5 tons per ha[26].

Interventions in Fisheries Sector under APRIGP:

Dry fish:

APRIGP will target 20,000 fry fish producers and to market 1,60,000 tons of quality dry fish processed under hygienic conditions. The key interventions will include input arrangement and marketing, quality enhancement, value addition, certification and improving market access. The intervention will be implemented in 67 mandals of 9 coastal districts – Srikakulam, Vizianagaram, Visakhapatnam, East Godavari, West Godavari, Krishna, Guntur, Prakasam and Nellore.

Wet fish:

APRIGP will target 30,000 producers to market 2,40,000 tons of processed and cleaned wet fish. The key interventions include hygienic processing and value addition, packaging, certification and marketing.

Potential Environmental issues and Environment friendly alternatives in the Dry fish value chain:

Component	Possible Issue	Intervention, Best practice
Interventions for hygiene management		
Cleaning before drying	Open disposal of fish wastes after cleaning in the water bodies and on land causes unhygienic conditions due to decomposition.	Fish waste can be dried and used in poultry feed. Safe method of disposal is burying away from water bodies. Fish waste can also be used to prepare fish meal and pest repellents for agricultural purpose.
Application of salt	Application of salt with bare hands will may cause harm to skin in long run.	Protect hands by using gloves or polythene bags.
Storage of cleaned fish	Cut and cleaned fish gets spoiled quickly if not stored properly and	After removing the viscera and gut contents the fish should be salted for

[24] 2012-13 (provisional).

[25] Fisheries Profile of the State: Andhra Pradesh, viewed at http://www.dahd.nic.in/dahd/WriteReadData/Fisheries%20States%20Profile/Andhra%20Pradesh.pdf, on 16th April 2014.

[26] Approach to the 12th Five year Plan Andhra Pradesh, January 2013 viewed at http://www.cess.ac.in/cesshome/pdf/Draft_Approach_to_12th_Plan_for_discussion.pdf on 28th January 2014.

	leads to health issues when consumed.	storage. The fish should be washed with chlorinated water. Incisions are made for large fish and vertical cut is made for small fish where salt is applied in 1:4 ratio (salt to fish ratio) to fish before stacking.
Drying	The fish may get contaminated with dirt when openly dried on ground. Health impacts on consumers due to improper drying and storage of fish.	Drying should be done on cement platforms or by spreading used gunny bags etc. Hanging on bamboo poles and ropes is another way of easy drying.Solar dryers and biomass dryers ensure clean drying. Fish should be dried upto the required moisture level and should be stored in air tight conditions.

Potential Environmental issues and Environment friendly alternatives in the wet fish value chain:

Component	**Possible Issue**	**Intervention, Best practice**
Interventions for hygiene management		
Permissions	Processing operations without required permissions and standards is illegal.	Required standards should be followed as per the requirements of Food Products Order and no objection certificate from State Pollution Control Board.
Cleaning	Cleaning with Seawater from near shore is likely to be contaminated with bacteria and other pollutants like industrial effluents and even fecal matters. This will spoil the fish quickly.	Immediately after unloading the catch should be washed well in order to free it from dirt and other extraneous matters. Cleaning with sea water taken from deep sea will sufficiently clean and will have only low bacterial load and therefore will be quite good for washing fish Cleaning fish with chlorinated water (10 ppm) avoids quick spoilage of fish.
Storage (before processing)	Fish gets quickly spoiled due to moisture and bacteria if not preserved properly until time of processing.	When processing takes time chill the fish immediately after washing at lowest temperature possible to avoid spoilage. In case of storage in ice the container

		should be easy to clean and should have facility to drain melted water.
Processing (cleaning gut contents)	Unhygienic processing leading to presence of insects, flies, sand etc and other extraneous materials will have impact on health in long run	Adopting hygienic handling practices such as ▪ Using gloves ▪ Washing the gloves after every use. Avoid processing near water bodies.
Storage of cleaned fish	Cut and cleaned fish gets spoiled quickly if not stored properly and leads to health issues when consumed.	After removing the viscera and gut contents the fish should be washed and stored under chilled conditions, salt can be added.
Disposal of wastes	Waste from the processed fish like gut, viscera etc. will contaminate the water bodies when disposed near water bodies and will create unhygienic environment due to decomposition when disposed openly.	Fish waste can be dried and used in poultry feed. Safe method of disposal is burying away from water bodies. Fish waste can also be used to prepare fish meal and pest repellents for agricultural purpose or composted.
Preparation of food products		
Fish pickle	Using non permitted colours, flavours is illegal and harmful to consumers health When not stored in ideal temperature and moisture conditions the product will be spoiled leading to fungal and mold infestation and illness when consumed.	Use only permitted flavors and additives in pickling. Details provided as *Annexe 3.* Fish pickle should be stored in prescribed containers under recommended temperature and moisture conditions.
Fish cutlets and other eatables	Ready to consume products when prepared, stored and served in un hygienic conditions leads to health problems.	Hygienic practices should be followed: • Use of gloves, hair cap, nose mask while mixing ingredients • Storage is clean containers in dry place • Serving or packing in clean utensils, material
Energy use for cooking	High energy consumption demands more fuel wood or non renewable resources	Plan for fuel efficient cook stoves or renewable resources like biogas.

Environmental Issues and Best practices in capture and culture fisheries:

Component	Possible Issue	Intervention, Best practice
Capture fisheries – interventions for better resource management		
Use of small size nets than permitted.	Use of small mesh size nets collects eggs and fingerlings of marine life and causes loss to bio diversity	Use nets with mesh size more than 1 inch in inland fisheries and more than half inch in marine fishing Release small fingerlings back into the water.
Fishing methods	Harmful fishing practices (dynamiting, electrocuting, poisoning) harm all aquatic species	Sustainable methods of fishing in prescribed seasons with prescribed size fish net should be followed.
Fishing season	Fishing in breeding season of fish results in capture of breeding population and affects future populations of fish	Fishing should not be done in closed season. • 14th April to 31st May for marine fisheries • 1st July to 31st August for inland fisheries
Disposal of nets	Improper disposal of fishing nets made up of nylon results in habitat destruction when disposed in water or shore.	Reuse the nets for alternate purposes like fencing kitchen garden, etc.
Disposal of extra catch	Extra catch such as snails, crabs etc. are usually disposed on the shore leading to loss of aquatic diversity	Extra unwanted catch should be disposed back into the water.
Culture fisheries – interventions for better resource management		
Preparation of the tank	Culturing fish without soil and water testing decreases productivity and may lead to increased in puts, or decline in water quality thus harming environment.	Soil and water testing should be done prior to stocking the fingerlings and corrective measures to be taken.
Fertilizer application	Excess fertilizer application for high productivity will lead to algal blooms and loss of fish due to depleted oxygen.	Follow the recommended dosage for fertilizer application o 1 ton of Farm Yard Manure per year per Ha o 200 kgs of urea and 200 kgs of Super Phosphate per year per Ha o 1500 kgs of oil cake per year per ha Organic and synthetic chemicals

<table>
<tr><td></td><td></td><td>should be applied alternatively once in 15 days.</td></tr>
<tr><td>Stocking density</td><td>Effective space utilization will not be there if recommended stocking density is not followed.</td><td>Recommended stocking density should be followed:
3000 – 5000 per ha for grass carps and silver carps
4000-5000 per ha for Catla, Rogu and Mrigal</td></tr>
<tr><td>Mono culture</td><td>Monoculture will not ensure effective space utilization and productivity per unit area</td><td>Poly culture of the 2-3 species in recommended ratios will ensure optimum space utilization and production.
The recommended ratios is:
<table><tr><th>Species</th><th>Density</th></tr><tr><td>Catla+ Rohu+ Mrigal</td><td>2:4:4</td></tr><tr><td>Silver carp+ Grass carp</td><td>1:1</td></tr><tr><td>Catla+Rohu+Grass carp+ Mrigal</td><td>4:3: 1.5: 1.5</td></tr><tr><td>Silver carp+Grasscarp+Commoncarp+Rohu</td><td>3: 1.5: 2.5: 3</td></tr></table></td></tr>
</table>

Annexe 1:

Popular and high yielding varieties grown in Andhra Pradesh[27]

S. No.	Zone	Districts	Varieties of Paddy grown
1	Southern Zone (SZ)	Nellore, Chittoor, southern parts of Prakasam and Cuddapah and eastern parts of Anantapur districts.	NLR+33892, NLR-145, BPT-5204, JGL-384, JGL-1798, Tikkana, MTU-1010, MTU-1001, NLR-34449
2	Krishna Zone (KZ)	West Godavari, Krishna, Guntur and Part of East Godavari (excluding uplands), Khammam, Nalgonda and Prakasam.	MTU-2077, MTU-1001, MTU-1061, MTU-1064, BPT-5204, Bapatla Sannalu (BPT 1768), MTU-1010, JGL-384, JGL-1798
3	Godavari Zone (GZ)	West Godavari, Guntur and Part of East Godavari (excluding uplands), Khammam, Nalgonda and Prakasam.	Swarna, MTU-1001, MTU-1010, MTU-1061, MTU-1064, PLA-1100, BPT-5204, IR-64, JGL-1798
4	North Coastal Zone (NCZ)	Srikakulam, Vizyanagaram, Visakhapatnam districts and upland taluks of East Godavari District.	Srikakulam, Sannual, Swarna, Vasundara, Sonamahsuri, MTU-1001, MTU-1010, IR-64.
5	Scarce Rainfall Zone (SRZ)	Kurnool, Anantpur (except south-eastern part), western part of Prakasam, and north-western parts of Cuddapah.	BPT-5204, Sonamahsuri, Kavya, JGL-384, JGL-1798
6	High Altitude Tribal Zone (HATZ)	Srikakulam, Vizyanagaram, Visakhapatnam, East Godavari and Khammam.	Srikakulam sannalu, Swarna, Pushkala, Vasundara, MTU-1001, MTU-1010

Pest and Disease resistant Varieties [28]

S. no.	Varieties	Salient features
1	Sravani (NLR-33359)	Resistant to blast, Helminthosporium, tolerant to Bacterial Leaf Blight, susceptible to Rice Tungro Virus

[27] Government of Andhra Pradesh; Department of Agriculture; http://agri.ap.nic.in/agroclimatezon.htm
[28] DACNET http://drd.dacnet.nic.in/Rice%20Varieties%20-%2010.htm

	(IET-14876)	
2	Somasila (NLR-33358) (IET-13932)	Resistant to blast and Helminthosporium, tolerant to BLB, susceptible to Rice Tungro Virus.
3	Swathi (NLR-33057) (IET-11582)	Resistant to blast, tolerant to Helminthosporium and Bacterial Leaf Blight, susceptible to Rice Tungro Virus, Stem Borer, Leaf Folder, Rice Hopper, rice thrips & Brown Plant Hopper
4	Vedagiri (NLR-33641) (IET-14328)	Tolerant to Stem Borer & Rice Tungro Virus; resistant to blast; susceptible to Brown Plant Hopper & Leaf Roller.
5	Maruteru Sannalu (MTU-1006) (IET-14348)	Susceptible to blast and Stem Borer.
6	Cottondora Sannalu (MTU-1010) (IET-15644)	Resistant to blast & tolerant to Brown Plant Hopper.
7	Bharani (NLR-30491) (IET-12630)	Resistant to Helminthosporium & Rice Tungro Virus, tolerant toStem Borer, susceptible to blast, Leaf Folder, Rice Hopper and Brown Plant Hopper.
8	Deepti (MTU-4870) (IET-8100)	Tolerant to Brown Plant Hopper.
9	Srikakulam Sannalu (RGL-2537) (IET-16023)	Resistant to blast & Stem Borer.
10	Vasundhara (RGL-2538) (IET-16085)	Tolerant to Rice Tungro Virus & blast, resistant to plant hopper and GM
11	Early Samba (RNRM-7) (IET-15845)	Tolerant to Stem Borer.
12	Surya (BPT-4358)	Tolerant to Brown Plant Hopper.

BLB=Bacterial Leaf Blight, RTV=Rice Tungro Virus, SB=Stem Borer, LF=Leaf Folder, RH=Rice Hopper, BPH=Brown Plant Hopper, LR=Leaf Roller.

Annexe 2:

Suitability of Livestock breeds to different geographic regions of Andhra Pradesh and location of main farms, and AI Stations.

The nativity and suitability of different indigenous Buffalo breeds to different regions of the state and farms is given below [29]:

Name of the Breed **D – Draught** **M- Milk purpose**	**Core Home Tract**	**Breeding Policy**	**Main farms**
Ongole (D+M)	Prakasam, Guntur, Nellore, Kurnool	Pure breeding and selection	Mahanandi (Kurnool), Lam (Guntur), Chadalavada (Prakasam district), Ramatheertham (Nellore district), Kakinada (East Godavari), Mahanandi (Kurnool), Vishakhapatnam, Ongole Cattle Breeding Farm, Ongole Cattle Breeding Project, Guntur.
Malvi (D)	Warangal, Khammam	Pure breeding and selection	Malvi is mainly found in MP / Chattisgarh, but are also found in the border districts of AP
Halikar (D)	Chittoor, Anantapur	Pure breeding and selection	Hallikar is mainly found in Karnataka but are also found in the border districts of AP

[29] Landscaping of initiatives in the area of animal health, breeding services and indigenous breed development for cattle, buffalo, goats, sheep and poultry in Andhra Pradesh. A Project of CALPI, New Delhi. Viewed at http://www.intercooperation.org.in/km/pdf/Documentation/Service/1st%20Study%20on%20vet%20services%20(Sastry).pdf on 6th February 2014.

Punganur (D)	Chittoor	Conservation	Palamner (Chittoor)
Local (D)	All districts	Cross breeding and selection	-----

The nativity and suitability of different indigenous Buffalo breeds to different regions of the state and farms is given below[30]:

Name of the Breed **D – Draught** **M- Milk purpose**	**Origin**	**Core Home Tract**	**Breeding Policy**	**Main farms**
Godavari - Murrah (M)	Haryana	East and West Godavari, Krishna, Guntur	Grading with Murrah breed	Venkataramannagudem, (W. Godavari)
Murrah grades (M)		All coastal districts	Grading with Murrah breed	Murrah PT Farm at Banvasi (Kurnool), Karimnagar
Local (D+M)		All districts	Grading with Murrah breed	----

The nativity and suitability of different indigenous Sheep breeds to different regions of the state and main farms is given below[31]:

[30] Landscaping of initiatives in the area of animal health, breeding services and indigenous breed development for cattle, buffalo, goats, sheep and poultry in Andhra Pradesh. A Project of CALPI, New Delhi. Viewed at http://www.intercooperation.org.in/km/pdf/Documentation/Service/1st%20Study%20on%20vet%20services%20(Sastry).pdf on 6th February 2014.

[31] Landscaping of initiatives in the area of animal health, breeding services and indigenous breed development for cattle, buffalo, goats, sheep and poultry in Andhra Pradesh. A Project of CALPI, New Delhi. Viewed at http://www.intercooperation.org.in/km/pdf/Documentation/Service/1st%20Study%20on%20vet%20services%20(Sastry).pdf on 6th February 2014.

Name of the Breed W– Wool purpose M- Meat purpose	Core Home Tract	Main farms
Nellore (M) types	Nellore Brown Nellore, Kadapa, Prakasam, Anantapuram	Cintaldevi (Nellore) Garividi (Nellore)
Jodupi	Kadapa	Chintaldevi (Nellore), Palamner (Chittoor)
Palla	Nellore (Atmakur Mandal)	Palamner (Chittoor)
Local (M)	Most districts	

The nativity and suitability of different indigenous Goats breeds to different regions of the state and main farms is given below[32]:

Name of the Breed W– Wool purpose M- Meat purpose	Core Home Tract	Main farms
Bellary	Karnataka border areas in Kurnool & Kadapa	-----
Local (M+D)	All districts	------

Five different breed types as sire breeds to be used in AI and organised natural service in the five regions[33].

[32] Landscaping of initiatives in the area of animal health, breeding services and indigenous breed development for cattle, buffalo, goats, sheep and poultry in Andhra Pradesh. A Project of CALPI, New Delhi. Viewed at http://www.intercooperation.org.in/km/pdf/Documentation/Service/1st%20Study%20on%20vet%20services%20(Sastry).pdf on 6th February 2014.

[33] Landscaping of initiatives in the area of animal health, breeding services and indigenous breed development for cattle, buffalo, goats, sheep and poultry in Andhra Pradesh. A Project of CALPI, New Delhi. Viewed at

Region	Recommendations
Cattle	
Coastal Andhra (North)	• Jersey bulls mated to non-descript cows • Jersey crossbred bulls (50% exotic) mated to Jersey crossbred cows
Coastal Andhra (Delta, South)	• HF bulls mated to non-descript and Ongole type cows in Delta area • HF crossbred bulls (50% exotic) mated to HF crossbred cows • Jersey bulls mated to indigenous cows in upland areas • Jersey crossbred bulls mated to Jersey crossbred cows • Ongole bulls mated to Ongole type cows in Ongole tract
Rayalseema	• Jersey bulls mated to indigenous cows • Jersey crossbred bulls (50%) mated to Jersey crossbred cows • Ongole bulls mated to Ongole type cows in parts of Kurnool and Cuddapah districts
Tribal Areas	• Jersey crossbred bulls (50% exotic) for natural service • Deoni bulls for pure breeding in selected areas
Areas with better management levels	• Jersey crossbred bulls (75% exotic) mated to Jersey crossbred cows (50%) • HF crossbred bulls (75% exotic) mated to HF crossbred cows (50%)
Buffaloes	
Statewide	• Purebred Murrah bulls mated continuously to non-descript and graded she-buffaloes (upgrading) • Graded Murrah bulls mated to non-descript and graded she-buffaloes in dry and drought prone areas with limited fodder resources

Breeds of cattle maintained at Semen Stations in India:[34]

District	Indigenous breed	Exotic breed	Cross bred	Buffalo
Vishakapatnam	Ongole	JR	JRx	Murrah

http://www.intercooperation.org.in/km/pdf/Documentation/Service/1st%20Study%20on%20vet%20services%20(Sastry).pdf on 6th February 2014.

[34] Conservation of Indigenous breeds of cattle and buffalo, viewed at http://www.dahd.nic.in/dahd/WriteReadData/large%20ruminants%20guidelines/Conservation_indigenous_breeds_Cattle%20and%20Buffalo.pdf, on 6th February 2014.

Nandyala	Ongole		JRx	Murrah
Banavasi,		HF	JR Jrx	Murrah

Annexe 3:

Food colours that can be used in food preparation and processing units[35]:

Natural colouring matters which may be used include:
(a) Carotene & Carotenoids including
(i) Beta-carotene
(ii) Beta-apo 8'- carotenal
(iii) Methylester of Beta-apo 8' carotenoic acid
(iv) Ethylester of Beta-apo 8' carotenoic acid
(v) Canthaxanthin
(b) Chlorophyll
(c) Riboflavin (Lactoflavin)
(d) Caramel.
(e) Annatto
(f) Saffron
(g) Curcumin or turmeric

No Synthetic food colours or a mixture thereof except the following shall be used in food:

Common name	*Chemical name*
Red Ponceau	Azo
Carmoisine	Azo
Erythrosine	Xanthene
2. Yellow Tartrazine	Pyrazolone
Sunset Yellow	Azo
Blue Indigo Carmine	Indigoid
Brilliant Blue	Triarylmethane
Green Fast Green	Triarylmethane

[35] Ministry of Health and Family Welfare, Food Safety and Standards Authority of India Notification, viewed at http://www.fssai.gov.in/Portals/0/Pdf/Food%20safety%20and%20standards%20(Food%20product%20standards%20and%20Food%20Additives)%20regulation,%202011.pdf on 28th March 2014.

Annexure 7

Environment Guidelines for Rural Retail Chains – KRuSHE Enterprises and KRuSHE marts:

Farm products:

1. Food products

Food products: Ginger products, Masala products and Pickels, Vermicelli, Papads, Snacks and Bakery, Sweet and milk products etc.

Potential Environmental issues and Environment friendly alternatives in food product preparation include:

Activity in the value chain or steps in the process	**Possible issues**	**Interventions, Best practices**
Registration and licenses	Manufacturing and selling of food products need license depending on the scale of activity.	License should be acquired as per Food Safety and Standards Act (FSSAI) 2006 if required.
Drying the raw materials, products	Drying on unclean floor will contaminate the produce by inducing microbial growth.	Clean and dry cement floor or mats should be used for drying. Solar dryers can be used depending on feasibility.
Use of machinery (for grinding ginger, masala and ingredients for pickle)	Use of unclean machinery for grinding raw materials may contaminate food.	Machinery (small mills and grinders) used for grinding ingredients should be cleaned and dried regularly.
Use of cook stoves (in bakery and snacks, sweet and milk products)	Use of LPG or fuel wood will lead to degradation of the resource and increase the fuel costs	Fuel efficient cook stoves or bio gas should be considered.
Use of preservatives, colour and flavour agents	Use of synthetic agents may have adverse effects.	Natural agents and permitted agents should only be used. Details of permitted agents is provided in *Annexe 1.*
Handling and packing	Handling the food products with bare hands or un washed hands will contaminate the products through microbial attack.	Personnel involved in processing, packing etc. should wash hands with soap before and after work and use aprons, gloves, hair caps for handling, packing etc. Use of eye goggles is

		recommended while handling pungent items like spices.
Packing and labeling	Edible products beyond the shelf life may lead to illness when consumed.	The product labelling should include the expiry date and should be marked with in the shelf life period.
Storage	Storage in improper conditions like moist, dusty floor, walls etc. will spoil the produce due to mold infestation.	Raw materials and produce should be stored in clean and dry conditions.
Facilities at processing centre	Poor facilities will have impact on worker's health	The place should be well ventilated, should have drinking water and sanitation facilities.
Waste management	Open disposal of waste from food processing unit will give bad odour and create unhygienic environment due to decomposition.	Any waste or waste water should be disposed properly by composting or diverting to waste water drains.

2. Food processing and drying

Products: Dry copra, mango jelly, dry fish:

Potential Environmental issues and Environment friendly alternatives in food processing and drying include:

Activity in the value chain or steps in the process	**Possible issues**	**Interventions, Best practices**
Drying the raw materials	Drying on unclean floor will contaminate the produce by inducing microbial growth.	Clean and dry cement floor or mats should be used for drying. Solar dryers can be used depending on feasibility.
Use of machinery (for pulper, etc. for mango jelly)	Use of unwashed machinery for pulping etc. has possibility to induce microbial growth	Machinery (pulper) should be cleaned and dried regularly.
Use of preservatives, colour and flavour agents for preserving the pulp	Use of synthetic agents may have adverse effects.	Natural agents and permitted agents should only be used. Details are provided in *Annexe 1.*
Drying the products (mango jelly, dry copra, dry fish)	Drying on unclean floor will contaminate the produce by inducing microbial growth.	Clean and dry cement floor or mats should be used for drying. Solar dryers can be used depending on feasibility.

Drying fish	Fish should be cleaned properly Before drying. Drying on unclean floor will contaminate the produce by inducing microbial growth.	Clean and dry cement floor or mats should be used for drying. Solar dryers can be used depending on feasibility.
Handling and packing	Handling the food products with bare hands or un washed hands will contaminate the products through microbial attack.	Personnel involved in processing, packing etc. should use clean hands before and after work and use aprons, gloves, hair caps for handling, packing etc.
Packing and labeling	Edible products beyond the shelf life will lead to health issues when consumed.	The product labeling should include the expiry date and should be marked with in the shelf life period.
Storage	Storage in conditions like moist, dusty floor, walls etc. will spoil the produce.	Raw materials and produce should be stored in clean and dry conditions.
Facilities at processing centre	Poor facilities will have impact on worker's health.	The place should be well ventilated, should have drinking water and sanitation facilities.
Waste management	Open disposal of waste from food processing unit will give bad odour and create unhygienic environment due to decomposition. Fish waste is rich in organic matter and will contaminate water resources when disposed in water or created un hygienic environment when disposed openly	Any waste or waste water should be disposed properly by composting or diverting to waste water drains. Fish waste can be dried and used as pig meals or fertilizer or pest repellents.

3. Oil Extraction

Products: Coconut oil, ground not oil and sesamum oil.

Potential Environmental issues and Environment friendly alternatives in oil extraction include:

Activity in the value chain or steps in the process	**Possible issues**	**Interventions, Best practices**
Use of machine for grinding	Machinery handling should be clean and proper.	Machinery should be cleaned and maintained well. Care should be taken while handling machinery.
Handling and packing	Handling the raw material and oil with bare hands or un washed hands will contaminate the products through microbial attack.	Personnel involved in processing, packing etc. should clean hands before and after work and use aprons, gloves, hair caps for handling, packing etc.
Facilities at processing centre	Poor facilities will have impact on worker's health.	The place should be well ventilated, should have drinking water and sanitation facilities.

Source of technical support for food product preparation, processing:

- College of Food Science & Technology, G.B.C. Road,
  Bapatla 522 101, Guntur District,
  Andhra Pradesh, India.
- College of Home Science, Saifabad, Hyderabad
- National Institute of Food technology Entrepreneurship Management
  3rd Floor, AMDA Building,
  7/6, Sirifort Institutional Area,
  August Kranti Marg,
  New Delhi – 110 049
  Phone: 011-264971 31/32/35
  Fax: 011-26497134
  Email: info@niftem.ac.in
- Central Food Technological Research Institute (CFTRI)
  Head
  Technology Transfer & Business Development
  Mysore 570 020
  Ph: +91-821-2514534
  Fax: +91-821-2515453
  E-mail: ttbd@cftri.res.in

- Rural Technology Park,
  National Institute of Rural Development (NIRD)
  Rajendranagar, Hyderabad – 500 030
  Ph – 040 – 24002037, Tele fax – 040 – 24008564.
  E mail: rtpnird@gmail.com, rtpnird@hotmail.com
- Divisional Office
  Khadi and Village Industries Commission
  Divisional Office, 13-28-8 Srihari Plaza, Dandu Bazar Maharanipeta
  Visakhapatnam, Pin: 530002
  Ph.:0891-25659048
  e-Mail:kvicvizag@gmail.com
- Respective District Industries Centres
- Respective Agriculture and horticulture departments, KVKs.

4. Forest based enterprises

Products: Hill brooms, tamarind, honey, herbal products will be marketed under forest based enterprises.

Potential Environmental issues and Environment friendly alternatives for forest based enterprises include:

Activity in the value chain or steps in the process	**Possible issues**	**Interventions, Best practices**
Permissions for Forest based enterprises	Issues regarding use of forest land, ownership rights, regulations from forest departments.	Required permission should be taken from Forest Department (differs from produce to produce) for collection.
Harvesting of NTFP	NTFP are scarce resources and unsustainable harvesting lead to loss of biodiversity.	Training on sustainable harvesting will check the loss of biodiversity.
Method of Collection of Raw material.	Destructive methods of collection such as cutting the branches, uprooting the plants, etc. damages the resource. Unscientific methods of collection may affect the quality of product there by leading to less revenue and thus over exploitation. Each forest product has some prescribed norms for collection.	Collection period and season of harvesting and tools used for collection should be as per standards prescribed. Trainings on these will help the communities to follow sustainable harvesting methods.
Processing of forest produce, preparation of herbal medicines.	Improper drying (drying on bare earth) and storage may contaminate the produce.	Drying of produce should be done on cemented platform.

	Processing using machinery for grinding, mixing, boiling etc. may lead to injuries. Energy use in boiling, drying etc. will required fuel wood. Sometimes due to lack of knowledge on mixing of different ingredient led to health issues.	Care to be taken while processing using machinery to avoid injuries and members to be trained on use of machinery. Energy efficient devices should be promoted. The members should be trained in preparation and use (to offer guidance to retailers or consumers). Date of processing and use and precautions of final products should be mentioned on the packets. Homeopathy doctor or Ayurvedic should be consulted for training and guidance at processing units
Selling the Herbal products	Selling of herbal products with without testing and without license is an offence.	Drug licenses should be obtained from each processing unit and periodic testing should be done at National Accreditation Board for Testing and Calibration Laboratories (NABLABS). AYUSH department will provide license to such unit which is mandatory for selling such products.

Sources of Technical Support:

- AYUSH Department of Andhra Pradesh
- Andhra Pradesh medicinal and Aromatic Plants Board
- A.P. Medicinal & Aromatic Plants Board,
  6th Floor, APGLI Building, Tilak Road,
  Abids, Hyderabad, 500001
  Tel.: 040-66364094,40047795
  E-Mail: apmaboard@gmail.com
- Khadi and Village Industries Commission
  Gandhi Bhavan, M.J. Road Nampalli
  Hyderabad, Pin: 500001.
  State: Andhra Pradesh.

- Divisional Office
  Khadi and Village Industries Commission
  Divisional Office, 13-28-8 Srihari Plaza, Dandu Bazar Maharanipeta
  Visakhapatnam, Pin: 530002
  Ph.:0891-25659048
  e-Mail:kvicvizag@gmail.com
- Respective District Industries Centres

Non Farm products

The nonfarm based commodities that will be procured, processed and sold in KRuSHE marts will include.

1. **Chemical and Mineral products**

The activities under these include - preparation of detergent, soap, shampoo, chalk pieces, rangoli, pain balm, phenyl, acid and liquid blue.

Potential Environmental issues and Environment friendly alternatives for chemical and mineral products include:

Activity in the value chain or steps in the process	**Possible issues**	**Interventions, Best practices**
Registration and licenses	Manufacturing and selling of chemical products without registration and license is illegal.	Registration of unit under DIC and chemical license and testing for toxic material is required.
Raw material	Poor quality raw material lead to burning of hands, breathing problems etc. during preparation and end use of the product.	Authentic source of raw material and suppliers and training on proportion of raw material to be mixed up can be given so that entrepreneurs will come to know the possible acid base reactions. Hand gloves, nose masks and goggles should be used while handling the raw materials or finished products.
Preparation (handling raw material in chalk piece, detergents etc.)	Inhalation of dust and handling the chemical and mineral based raw material for long time may be detrimental for health.	Hand gloves, nose masks and goggles should be used.
Detergent use	Due to varied quantity of raw material, clothes generally lose their actual colour.	Before packaging it can be ensured through proper testing and possible effects on fabrics.
Storage of ingredients	Improper storage of ingredients will pollute the air and cause health risks to the workers.	Air tight containers should be used for storage and storage should be as per the guidelines.
Energy consumption	Preparation and packing	Green energy sources can be

	require lot of energy consumption so permanent source of energy is needed	promoted.
Packaging	Use of un decomposable packaging material further cause the soil pollution	Bio degraded able ingredients and re-useable packaging should be promoted
Detergents		
Use of raw materials	Non essential detergent ingredients like perfumes, colours brighteners leave toxic residues after use	Avoiding these ingredients will make the detergent more environment friendly
Surfactants	Synthetic surfactants like Alkyl benzene Sulfonates, diethanolamines etc. are slow to degrade and residues are highly toxic and carcinogenic. Causes skin and eye irritations.	Synthetic surfactants may be replaced by non petrochemical surfactants or vegetable oil soaps.
Builder material	The builder material in detergent 'phosphate' when released into water after detergent use leads to eutrophication of water bodies affecting water quality and aquatic biodiversity	Builders like phosphates can be replaced by sodium citrate and sodium bicarbonate.
Optical brightners and artificial fragrances	Optical brightners like Chlorine and sodium hypochlorite causes skin and eye irritation and are dangerous to aquatic life.	Optical brighteners and perfumes can be avoided are their function is not very important in cleaning.
Storage of raw materials	The chemicals tend to react when not stored in prescribed conditions.	The chemicals should be stored in proper conditions
Mixing the raw materials in detergent making	The chemicals are harmful to skin and causes irrigation on contact with skin.	Gloves and nose masks should be used while mixing the chemicals to prepare detergent.
Waste disposal	Wastage during mixing and washing after work leaves residues in the surrounding accumulated in soil and water.	Utmost care should be taken to avoid wastage or spillage while mixing, so that there is less waste to clean.
Packing	Package in small sachets needs more plastic	Package in larger sachets to the extent possible.
Labeling	The product may be considered as safe and precautions not taken if not	According to the labeling requirements laid down by BIS, each packet of detergent

	labeled properly.	powder should carry information on the name/grade of the material used, the source of manufacture, and a caution statement which reads: Detergent solutions can be skin irritants. Avoid prolonged contact. Rinse garments and hands thoroughly. The label should also carry information about the critical ingredients used in the formulations.
Phenyle		
Storage of raw materials	Improperly stored raw materials leads to low quality products or contaminate the environment leading to health hazards.	The raw materials should be stored properly according prescribed standards.
Mixing raw materials	Handling with bare hands lead to skin irrigations and inhalation on long term to respiratory issues.	Gloves and masks should be used while mixing ingredients.
Waste disposal	Wastage and disposal of wastes lead to residues in soil and water.	Wastage should be avoided and any waste should be cleaned regularly.
Preparation of ingredients	In cases where ingredients are also prepared, accidents are possible while mixing oils (castor oil, pine oil) and caustic soda and boiling.	Care should be taken to avoid any fore accidents.

2. Textiles, Artisans and Handicrafts

Potential Environmental issues and Environment friendly alternatives for textiles, artisans and handicrafts include:

Products: Textiles, handlooms, handicrafts, schools bags, foot wear, basket making, paper plates, paper covers.

Activity in the value chain or steps in the process	**Possible issues**	**Interventions, Best practices**
Work space	Poor facilities will have impact on worker's health.	The work space should be well ventilated, provided with drinking

		water and toilet facilities.
Use of machinery and tools	Use of machines and tools may lead to injuries at times.	Members should be aware of safety precautions during use of machines and tools. First aid kit should be kept handy.
Energy use	Use of electricity in stitching, paper cup and plate manufacturing units is associated with carbon emission.	Possibility of solar energy run based machinery can be explored.
Use of dyes (textiles, handicrafts, handlooms)	Handling chemical dyes leads to skin and respiratory related problems.	Natural dyes must be referred and gloves and masks to be used for handling dyes.
Waste disposal	Open disposal of waste like cloth rags, leather etc. from textiles, handicraft and foot wear units will create unpleasant sight.	The waste should be sold for reuse or disposed properly.

3. Candle making and bangle making

Potential Environmental issues and Environment friendly alternatives for candle making and bangle making include:

Activity in the value chain or steps in the process	**Possible issues**	**Interventions, Best practices**
Candle making: Fuel use, heating	Wax over heated above 150^0 gives dangerous fumes and hence fuel source is important. Conventional stoves require high quantities of fuel and cause air pollution. Handling hot wax may lead to accidental spill and cause boils.	Avoid overheating, and use efficient fuel. Wax should not be allowed to spill into flame as it leads to fire hazard. This can be avoided by using water jacket (a vessel with water around the wax container while heating). Use fuel efficient, smoke less cook stoves. Gloves should be used while handling wax in candle making.
Bangle making: Work space	Congested work spaces will have an impact on health in long run due to inhalation of smoke and exposure to heat.	The work space should be well ventilated.
Fuel use, heating (traditional method).	Conventional stoves require high quantities of fuel and cause air pollution to the workers.	Use fuel efficient, smoke less cook stoves. Motorised machine can be used for making bangles.

4. Agarbathi and Coir making

Potential Environmental issues and Environment friendly alternatives for Agarbathi making and coir making include:

Activity in the value chain or steps in the process	**Possible issues**	**Interventions, Best practices**
Work space	Congested work spaces will have an impact on health in long run due to inhalation of	The work space should be well ventilated and should have basic facilities like drinking water,

	charcoal dust in agarbathi and coir dust in coir making units.	toilets etc.
Agarbathi rolling and coir extraction, processing	Inhalation of charcoal dust and handling gigat and charcoal with bare hands will have impact on health. Inhalation of coir dust leads to respiratory disorders	Nose masks and hand gloves should be used while rolling agarbathis and processing coir.

5. Salt making

Potential Environmental issues and Environment friendly alternatives for salt making include:

Activity in the value chain or steps in the process	**Possible issues**	**Interventions, Best practices**
Work space	Salt making is hard job and continuous exposure to salt in hot sun will affect workers health.	Improve workplace amenities, such as access to potable drinking water, mobile clinics, protective gear, sanitation, rest sheds.
Health	Eye problems, dermatological problems headaches and giddiness is frequently experienced by the salt workers.	Regular occupational health camps to be organised for the slat workers.
Loss of brine water	During unexpected rains the salt water let for evaporation could be lost.	Embankments to be constructed to withstand floods

6. Mineral water

Potential Environmental issues and Environment friendly alternatives mineral water include:

Activity in the value chain or steps in the process	**Possible issues**	**Interventions, Best practices**
Water source	Ground water - The water source contaminated with chemical residues will effect quality and there by consumer health.	The water should be tested and should be treated to remove residues, turbidity and pathogenic microbes. The removed residue, sludge should be safely disposed. Artificial recharge techniques can be followed in areas with high

	Surface water - In monsoon microbial water contamination is possible.	fluoride content. Regular check on water on all parameters to ensure drinking quality.
Workers hygiene	The workers hygiene is important to avoid microbial contamination.	The workers should be aware of the hygiene practices like – washing hands, using gloves, hair caps, not attending work when sick with contagious diseases etc.
Cleaning of bottles, cans	The water used for cleaning when disposed openly allowed to stagnate will lead to mosquito breeding etc, pollution of nearby water bodies etc.	The waste water should be disposed through soak pit or proper drainage.

Sources of Technical Support for Nonfarm enterprises:

- Rural Technology Park,
  National Institute of Rural Development (NIRD)
  Rajendranagar, Hyderabad – 500 030
  Ph – 040 – 24002037, Tele fax – 040 – 24008564.
  E mail: rtpnird@gmail.com, rtpnird@hotmail.com
- Divisional Office
  Khadi and Village Industries Commission
  Divisional Office, 13-28-8 Srihari Plaza, Dandu Bazar Maharanipeta
  Visakhapatnam, Pin: 530002
  Ph.:0891-25659048
  e-Mail:kvicvizag@gmail.com
- Khadi Village Industries Commission
  KGMV (Khadi Gramodyoga MahaVidyalay)
  Rajendranagar, Hyderabad
- Respective District Industry Centres

Annexe 1:

Food colours, preservatives, additives that can be used in food preparation and processing units[36]:

Natural colouring matters which may be used include:
(a) Carotene & Carotenoids including
(i) Beta-carotene
(ii) Beta-apo 8'- carotenal
(iii) Methylester of Beta-apo 8' carotenoic acid
(iv) Ethylester of Beta-apo 8' carotenoic acid
(v) Canthaxanthin
(b) Chlorophyll
(c) Riboflavin (Lactoflavin)
(d) Caramel.
(e) Annatto
(f) Saffron
(g) Curcumin or turmeric

No Synthetic food colours or a mixture thereof except the following shall be used in food:

Common name	*Chemical name*
Red Ponceau	Azo
Carmoisine	Azo
Erythrosine	Xanthene
2. Yellow Tartrazine	Pyrazolone
Sunset Yellow	Azo
Blue Indigo Carmine	Indigoid
Brilliant Blue	Triarylmethane
Green Fast Green	Triarylmethane

Class I Preservatives - permitted in foods:
Common salt.
Sugar.
Dextrose.
Glucose Syrup.
Spices.
Vinegar or acetic acid.
Honey
Edible vegetable oils

[36] Ministry of Health and Family Welfare, Food Safety and Standards Authority of India Notification, viewed at http://www.fssai.gov.in/Portals/0/Pdf/Food%20safety%20and%20standards%20(Food%20product%20standards%20and%20Food%20Additives)%20regulation,%202011.pdf on 28th March 2014.

Class II Preservatives – Use of more than one is prohibited (useage should be in recommended doses):
Benzoic acid including salts thereof
Sulphurous acid including salts thereof
Nitrates or Nitrites of Sodium or Potassium in respect of food like ham, pickled meat,
Sorbic acid including its sodium, potassium and calcium salts, propionates of calcium or sodium, lactic acid, and acid calcium phosphate.
Nisin
Sodium and calcium propionate.
Methyl or propyl Parahydroxy-Benzoate.
Propionic acid, including esters or salt thereof,
Sodium diacetate, and
Sodium, potassium and calcium salts of lactic acid.

The use of the following flavouring agents are prohibited in any article of food, namely:
Coumarin and dihydrocoumarin;
Tonkabean (Dipteryl adorat);
asarone and cinamyl anthracilate".
Estragole
Ethyl Methyl Ketone
Ethyl-3-Phenylglycidate
Eugenyl methyl ether
Methyl β napthyl Ketone
P.Propylanisole
Saffrole and Isosaffrole
hujone and Isothujone α & β thujone.
Solvent in flavour.
Diethylene Glycol and Monoethyl ether shall not be used as solvent in flavours.

For specific details on permitted flavors, colors and additives in food products and dosages please refer Food Safety and Standards Authority of India notification (available at - http://www.fssai.gov.in/Portals/0/Pdf/Food%20safety%20and%20standards%20(Food%20product%20standards%20and%20Food%20Additives)%20regulation,%202011.pdf)

Annexure 8:

Guidelines for Drinking water supply, Toilets and Construction works:

Guidelines for Drinking Water Supply:

Location of water source:

- Water source should not be closer than 15 m to the nearest leach pit or drain
- It should not be closer than 300 m from nearest significantly used well
- It should be situated more than 500 m from the sea coast (HTL) or edge of backwater
- It should not be located in a notified groundwater stress areas identified by the State Government without obtaining requisite permission
- It should not be located in an area having absence / inadequacy of drainage
- It should not be closer than 100 m from the nearest sewage / industrial effluent disposal facility / land fill site
- In case of surface water sources, it should be ensured that construction activity does not cause land erosion, subsidence, instability or alteration of natural drainage
- It should not be located near or within any designated Natural habitat, wetland, sensitive ecosystems such as National Parks, Wildlife Sanctuaries without written permission from Forest Department
- It should not be located in a waterlogged area
- No displacement of local inhabitants is required for setting up the scheme

Ensuring Water Quality:

- Ensure the water quality testing of the source before planning of the water supply. Make sure that any water quality issues identified in the report are addressed suitably before any further work is undertaken.
- Ensure periodic monitoring of water quality with help of nearest water testing labs and facilitate disinfection or water treatment when ever required.
- Monitor regular cleaning of water tank by panchayat

The responsibility of checking and integrating the above guidelines lies with GCRP and action on the same lies with VO with support of Capacity Building Person in HD team at mandal level.

Apart from these generic guidelines site specific EMPs are to be prepared during establishing of drinking water supply with support of Sate Environment Expert and technical support agencies.

Guidelines for Individual Household latrines:

- Safe distance of the toilet from drinking water sources to be followed. The location of the septic tank should be downhill from the water source depending on feasibility. The safe distance depends on local hydrological conditions, however 30 mts is treated as safe distance.
- In areas with water scarcity water efficient toilets like ecosan toilets can be constructed
- Appropriate location should be selected which will not discourage the use in consultation with the household.
- Awareness on use and maintenance to be created to the households prior to construction
- Water facility should be provided inside to the extent possible.
- 2 pit system toilet with Pan with steep slope 25^0-28^0 and trap with 20 mm water seal as designed by Sulabh International will reduce the usage of water (required 1-1.5 lits for flushing).
- Hand wash facility outside the toilet should be made integral part of design or facility of water and soap should be made available outside.
- Proper ventilation to be ensured as lack of ventilation or electricity discourages the use
- The debris should be disposed away from the site preferably though land filling.

The responsibility of checking and integrating the above guidelines lies with GCRP and action on the same lies with VO with support of Capacity Building Person in HD team at mandal level.

Apart from these generic guidelines site specific EMPs are to be prepared for construction of community toilets with support of Sate Environment Expert and technical support agencies.

Guidelines for construction works:

- Constructions should not happen in fertile agricultural lands or borrowing soil from fertile agricultural lands for construction should be avoided
- Construction site should not be prone to water logging on inundation during monsoons
- All the construction waste should be disposed into a pre identified land fill or used for construction of roads under NREGS etc. the condition of disposal should be built into the contracts
- Ensure required ventilation and natural illumination to reduce the need for energy
- Fire proof and leakage proof measures to be integrated into the building design

The responsibility of checking and integrating the above guidelines lies with GCRP and action on the same lies with VO with support of Capacity Building Person in HD team at mandal level

Apart from these generic guidelines site specific EMPs are to be prepared during construction works with support of Sate Environment Expert and technical support agencies.

Annexure 9:

Report on Stakeholder Consultations

Consultations in Visakhapatnam

Details of the consultation workshop:

Date: 25th June 2014.
Venue: TTDC (*Mahila Pragathi Pranganam*), Pendurthi
Time: 11:00 Am to 2:00 PM

The consultation workshop was chaired by Additional Project Director (APD), Indira Kranthi Patham (IKP) and Mr. Jayaram Killi, State Consultant, Community Managed Sustainable Agriculture. Ms. Vanitha Kommu, Environment Consultant World Bank took part as observer. The participants were welcomed by the District Project Manager and presentation on EMF was made by Mr. Jayaram Killi. The key aspects of presentation include:

- Background, objective and components of APRIGP project
- EMF in APRIGP project, Process of EMF development
- Key aspects of EMF – Value chains, Human development interventions and ICT and partnerships
- EMF implementation arrangements – tools, implementation mechanism, human resources required, capacity building and monitoring
- Expected outcomes of EMF

Followed by the presentation, the discussion was facilitated by Mr. Jayaram Killi and Ms. Vanitha Kommu. Concluding remarks were given by the APD.

Key discussions:

- Positive and Negative impacts of the technology should be carefully considered in production and processing of all value chain commodities.
- Plantations can be promoted by community. Measures for deforestation need to be promoted under the project
- Inclusion of millets in value chains will encourage millet farming and addresses nutritional needs. Vegetables can be included with eco friendly technologies to avoid wastage.
- The intervention in the value chain 'varietal replacement' should be reconsidered. Importance should be given to good yielding traditional varieties.

Paderu turmeric variety should be patented. Herbal product preparation activities can be promoted in agency area.

- Hybrid seed should not be provided for kitchen gardens
- Knowledge on sowing dates etc. to be disseminated among Producer Groups keeping the changing climate in view.
- NTFP livelihood to be included in value chains – interventions like Gumkaraya plantations as social forestry. Activities like grading, deseeding tamarind etc. will add value to the product. Marketing issues need to be addressed - for marketing with GCC the members face constraints like - long distance travel with the produce, loss of time etc.
- Piper longum is commonly grown medicinal plant by tribals in the region by about 8000-10000 families in 7-8 mandals out of 11 mandals. Interventions for productivity enhancement, processing, grading and processing should be thought of.
- Livestock – conservation of local breeds should be considered. Jersey and HF breeds may not tolerate the climate in all geographical regions. If biogas intervention is promoted, maintenance of the plant is crucial and arrangements should be made for the same.
- RWS role in the HD component – Quality check, trainings and handholding support for ensuring that environment guidelines are regularly followed in water and sanitation interventions. Tie up with RWS department is workable under the project, but awareness among the community is the key for success of the interventions and it would be advisable to do the interventions in some pilot villages initially to set an example.
- Anganwadis will be provided with RO drinking water plants by RWS. RWS trainings are done at mandal level but has not reached VOs – project can join in this initiative for further dessimination.
- ICDS – for Anganwadi worker's meetings on environment happen regularly which cover about environmental and personal hygiene. These can be attended by CRPs as well and ICDS can take part in MMS, VO meetings as required
- IHHL – NREGS. Payment is only happening for septic tanks not for leach pits. Information should be give to AEs on guidelines.
- IKP has motivated SHGs but many do not have space for toilet construction. Community toilets are proposed but maintenance is required.

List of participants:

ZILLA SAMAIKYA - VISAKHAPATNAM

WORK SHOP ON ENVIRONMENT MANAGEMENT FRAME WORK

Dt. 25.06.2014

S.No.	Name of the Participant	Designation	Name of the Dept	Signatureof the Participant
1	Dr. V. Venkateswarlu	JD (AH)	Animal Husbandry	[illegible]
2	Dr. U.S. Mahapatra	AD (CLPDD)	Animal Husbandry	[illegible] 25/6/14
3	V. Ravi Kumar	Procurement Specialist Exe. Engineer	RWS&S Visakhapatnam	[illegible]
4	KLRK Kumari	CDPO, ICDS Penduriti	WD&CW	[illegible] 25/6/2014
5	M.V.V.S. Umadevi	Addl PD	DRDA	[illegible]
6	Vanitha Kommu	Consultant World Bank	World Bank	Vanitha. K
7	V. KRISHNA RAO	CEO	Kovel Foundation VSP.	[illegible]
8	M. Lakshmikanth	FODACRA	APM-Krishi	[illegible]
9	M. Lakshmi	APm, H.N	IKP / DRDA	[illegible]
10	P. Ramana	DPM - CMSA	IKP / DRDA	[illegible]
11	J. SRINU	APm-Dairy	IKP / DRDA	[illegible]
12	A. LAKSHMI	Sabbavaram	N.P.M. CA	A. LAKSHMI
13	K. Bharathi	"	N.P.M. VA	K. Bharathi
14	P. PYDIRAJU	Anandapuram	N.P.M. C.A	P. PYDIRAJU
15	G. Lakshmi Kumari	[illegible]	SABALA	G. Lakshmi [illegible]

ZILLA SAMAIKYA - VISAKHAPATNAM

WORK SHOP ON ENVIRONMENT MANAGEMENT FRAME WORK

Dt. 25.06.2014

S.No.	Name of the Participant	Designation	Name of the Dept	Signatureof the Participant
1	P. Sai Prasad	APM	IKP - DRDA	P. Sai [illegible]
2	L. Pydithalli	NPMCA	Anandapuram	L. Pydithalli
3	Ch. Narayanamma	C/B [illegible]	"	CH. [illegible]
4	P. Satyanarayana	Environmental Expert, DPSU APRWSSP, VSP	RWS	P. Sat[illegible]
5	S.K. Patcheshah	IEC Specialist 8106945557	RWS&S	[illegible] Patchashah
6	N Adiyya	DPM-CMSA	I.KP-DRDA	[illegible]
7	G. BUJJI	[illegible]	[illegible]	[illegible]
8	V. SAROJINI LAKSHMI	[illegible]	S. RAYAVARAM	V. Sarojinilakshmi
9	P. Manikyam	"	[illegible]	[illegible]
10	Ch. [illegible]	"	[illegible]	[illegible]
11	J. [illegible]	ZS OB	[illegible]	J. [illegible]
12	G. Bhagyalakshmi	P.C	cdm	[illegible]
13	N. Umamaheswari	PC	CMSA	[illegible]
14	K.V Lakshmi	coordinator	SRIKAKULAM SWEEP-NGO	K. Lakshmi
15	K [illegible]	[illegible]	SABALA	K [illegible] 8985348256

Consultations in Kurnool

Details of the consultation workshop:

Date: 30th June 2014.
Venue: Training and Technology Development centre (TTDC) - *Mahila Pragathi Pranganam*, Kurnool
Time: 12:00 Am to 1:30 PM

The consultation workshop was chaired by Project Director (PD), Additional Project Director (APD), Indira Kranthi Patham (IKP) and Mr. Jayaram Killi, State Consultant, Community Managed Sustainable Agriculture. Ms. Vanitha Kommu, Environment Consultant World Bank took part as observer. The participants were welcomed by the District Project Manager and presentation on EMF was made by Mr. Jayaram Killi. The key aspects of presentation include:

- Background, objective and components of APRIGP project
- EMF in APRIGP project, Process of EMF development
- Key aspects of EMF – Value chains, Human development interventions and ICT and partnerships
- EMF implementation arrangements – tools, implementation mechanism, human resources required, capacity building and monitoring
- Expected outcomes of EMF

Followed by the presentation, the discussion was facilitated by Mr. Jayaram Killi and Ms. Vanitha Kommu. Concluding remarks were given by the PD.

Key discussions:

- SC, ST lands to be brought under cultivation and tribal mandal with high population of 'Chenchu' tribes should be not included under project: Kothapally, Atmakur, Allagadda.
- Departmental schemes like – mini kits for vegetables, backyard poultry, azolla etc. can happen through convergence.
- Under biogas intervention – instead of vermicomposting 'Tejus' culture (fungal and bacterial culture) can be used which decomposes waste in 1-1.5 months.
- Subsidy on Solar water pumping is not enough for small and marginal farmers to take up solar water pumps, part of subsidy could be be met through APRIGP.
- For all drinking water bore wells water recharge structures should be made compulsory in the project, even though guidelines are there, they are not followed in general.
- Water shortage is serious drawback for IHHL and hence models like Eco san toilets need to be promoted. Awareness programmes for acceptance are the key for the uptake.

List of participants:

30/06/14

Environment Management Frame works

S No	Name	Name of the Department	Designation	Mobile No	Signature
1	Y ANNAPURNA DEVI	DRDA-IKP	I/c. APO (Dairy)	9177101476	[illegible] 30/6/14
2	K. Subbamma	Z.S	Z.S [illegible]	8008668993	[illegible]
3	P. [illegible]	MMSP	MMS P	9705240409	P. [illegible]
4	[illegible]	NPM - ZS sub. committe	NPM. ZS.	8500449015	[illegible]
5	M. Mallamma	NPM - ZS sub. committe	ZS. NPM. [illegible]	8500452455	M. Mallamma
6	E. Lakshmi	NPM - ZS sub committe	Z.S N.P.M [illegible]	9000881036	E. Lakshmi
7	M. Lakshmi	NPM - ZS sub committe	Z.S N.P.M [illegible]	7702888685	M. [illegible]
8	B. Shashidhar Reddy	Agriculture	A.O	8P86613060	[illegible]
9	K. RAJA	NGO CRDSSS	Secretary	9866500534	K. Raja
10	V. Sasikala	RWS	Site Engineer	8801238481	V. [illegible]
11	D. Suvarna	PRESS	president	8185057616	[illegible]
12	G. Ammandi	WD&CW Dept.	C.D.P.O (R)	9440814619	[illegible] 30.6.2014
13	K. ASWINI PRIYA	RWS&S Dept.	A.E	8125791584	K. Aswini Priya
14	K. Maheswari		Z.S. Vice President	9491856175	K. Maheswari
15	V.E Narasimha Reddy	Village Renewal Organisation KURNOOL	PRESIDENT	9989481631	VReddy

16	P. లసంతమ్మ	Chennakeshava Group, MMPS - (Nannur)	NPM Sub Committe	9581203239	లసంతమ్మ (నన్నూరు)
17	B. Kalpalatha	DRDA - IKP	APM (HN & BT)	9177101428	R. Kalpal[illegible]
18	CM. Vijay	NGO : RSDS	President	9866326565	[illegible]
19	Dr. P. RAMANAIAH	Animal Husbandry.	Asst. Director	9989997104	[illegible]
20	S. Babu Rao	~~APM (NF)~~ IKP - Knl	APM (NF)	9866550629	[illegible]
21	N. SRINIVASULU	APM - IKP	APM - CMSA	9866550937	[illegible]
22	M. Rajavardhana	D.R.D.A	D.P.M (N.F)	9177101472	[illegible]
23	Keshamma	MMPS (Dhone)	president	-	కేశమ్మ
24	N. Maddamma	Z.S president-Knl	president	9866550952	[illegible]
25	K. Mariamma	Z.S. Trajarare	Trajarare	8886237851	K. Mariamma
26	P. Vijayalakshmi	Z.S. Joint Secretary	Z.S.	9701383699	P. Vijayalakshmi
27.	Lalamma	Z.S. yeldurti	Secretary	—	[illegible]
28.	P. Ambaji Rao	TSP - Kurnool		9700593535	Ambaji Rao.
29.	A. Ramanjaneyulu	NPM - IKP	DPMU	9885447954	A. Ramanjaneyulu

Annexure 10:

Format for Environmental Appraisal of Value Chains:

Name of the Producer Group or Enterprise:

Village, Mandal and Distrct:

Activity proposed:

Details of environmental Appraisal:

1. Screening done or not (Yes or No):

2. Any activity that falls under negative list, if yes required permissions are taken or planned to be taken, (or) the particular activity is dropped or changed: (give details)

3. Greening of Value chain happened or not (yes or no).

3.a. If yes give the details of environment guidelines integrated and support requested

Environment Issue indentified	**Environment Guidelines or mitigation measures integrated**	**Support requested.**

Name and Signature of Appraiser: Date:

Format for Environmental Appraisal of HD plans or Village Infrastructure Plans (VIPs):

Name of the VO:

Panchayat, Mandal and District:

Activities proposed under HD plan or VIP:

Details of environmental Appraisal:

1. Screening done or not (Yes or No):

2. Any activity that falls under negative list, if yes required permissions are taken or planned to be taken, (or) the particular activity is dropped or changed: (give details)

3. Environment Guidelines are integrated into the HD plan or not (yes or no).

3.a. If yes give the details of environment guidelines integrated and support requested

Activity	**Environment Issue indentified**	**Environment Guidelines or mitigation measures integrated**	**Support requested.**

Name and Signature of Appraiser: Date:

Annexure 11:

Terms of references for Technical Agencies, Experts.

1. Inputs for TOR for hiring Environment Expert at Project Management Unit (PMU) for AP Rural Inclusive Growth Project (APRIGP)

Introduction:
Society for Elimination of Rural Poverty (SERP), Proposes Andhra Pradesh Rural Inclusive Growth Project (APRIGP) which aims at supporting the SERP's goal of making the State poverty free by 2017 strategy of including poor into benefits of economic growth and this is consistent with the India Country Strategy (CAS) FY 2009-2012 and aligned with the three CAS objectives of (a) achieving rapid, inclusive growth, (b) ensuring that development is sustainable, and (c) increasing the effectiveness of service delivery. The project is also consistent with approach for XII Five Year Plan for a 'faster, sustainable and more inclusive growth' and growth target of 8.2 percent. The overall strategy is to look beyond growth and focus on generation of employment to the millions of the youth in the State. This would eventually result in a faster reduction in unemployment and poverty through skill development and also help bridging multiple divides.[37] Finally, the project also supports the GoI's "Finance Plus" approach by investing in building community institutions that can foster higher order impacts, bringing various schemes together on to one synergistic platform (gender, nutrition, education and livelihoods), improving service delivery in a sustainable manner, innovations and pilot approaches, besides leveraging financing from public and private sources through convergence and partnerships.
The objective of Andhra Pradesh Rural Inclusive Growth Project (APRIGP) is 'to enable selected poor households to diversify and enhance sources of income and secure increased access to human development services and social entitlements'.
This will be achieved by supporting Government of Andhra Pradesh (GoAP) in consolidating the rural poverty reduction initiatives under previous IDA supported projects (Andhra Pradesh District Poverty Initiatives Project and Andhra Pradesh Rural Poverty Reduction Project) with an emphasis on inclusive growth and livelihoods sustainability.

A very brief description of the project components is given below:

Component 1: Value Chain Enhancement through Producer Organizations:
This component will work with small and marginal producers who have built up productive assets and have previously participated in productivity improvement and technology introduction programs. This component will have two sub-components viz. Rural Value Chains and Rural Retails Chains/Small Enterprises.

Component 2 - Human Development:

This component will invest in 'lifecycle approach' through targeted mobilization of poor households for achieving MDGs in health and education leveraging the existing community institutional network. This would include special packages for tribal areas in the State.

[37]Socio-Economic Survey 2011-2012; Department of Planning, Government of Andhra Pradesh, March 2012

Component 3 - Access to entitlements:
Access to social safety nets and entitlements will be the core agenda in the strategy for inclusion of the poorest households. This component will invest in leveraging existing institutional platform to ensure reliable and universal access to entitlements and public services (like food security, MNREGS, social pensions, scholarships, etc.).

Component 4: TA, ICT & Partnerships:
The objective of this component will be to improve the performance of project implementation and enhance coordination mechanisms with supply/demand side partner institutions by providing them technical assistance, strategic advisory and knowledge management services. The project will encourage productive partnerships to increase the integration of poor in performing and remunerative value chains.

Component 5 - Project Implementation Support:
The objective of this component is to strengthen the project implementation and will finance dedicated staffing for the project activities that are attributable to outcomes of the project, consultancies, training and related material, office equipment, and operational costs. It will also support establishing Monitoring, Evaluation and Learning (MEL) systems, Financial Management systems, Procurement Management, Governance and Accountability Systems, Knowledge Management and Communication, etc.

For more details on the project refer to the Project Implementation Plan (PIP).

Background Analysis:

The Environment Management Frame Work (EMF) for the APRIGP is an integral part of the implementation arrangements related to activities concerned with environmental implication. An Environment study was undertaken and an Environment Management Framework has been developed for the APRIGP to ensure that interventions of projects are environmentally sustainable and compliance with applicable laws and regulations of the Government of India, the Government of Andhra Pradesh and triggered safeguard policies of the World Bank.
The EMF is applicable to all components of the project in general and particularly to 'Value chain enhancement through producer organizations' and 'Human development components'as the activities proposed under these two components are likely to have a bearing on the surrounding environment.

The EMF implementation will be through the process of integration of environmental guidelines into the plans developed by the community under each component, Environment Appraisal of the plans developed for verifying the integration of environment guidelines and ensuring the implementation of specified guidelines and measures. An EMF manual and Environment Appraisal (EA) tools will be developed to screen the activities for any adverse impact on environment and to check the compliance with WB safeguard policies and legal and regulatory frame work of GOI and GOAP. Environmental Guidelines Suggests alternatives for mitigating potential risks and suggest negative list for both the component 1 and 2.

Monitoring (through green audits) for the compliance is very critical for smooth implementation of EMF and to enhance the income levels of the beneficiaries by exploring business opportunities for fair trade, clean development mechanism etc.

Scope of Job:
The Environment Expert will be positioned at State level and is expected to handle the overall implementation of all components of EMF across the state – this would include facilitation of staff at PMU and at district and cluster levels, technical agencies hired for specific purposes, ensuring smooth flow of capacity building programmes at state, district, cluster and village levels, and monitoring.

Objective:
- To provide required facilitation for implementation of EMF

Key Tasks and Responsibilities:
- Integrate EMF aspects into relevant project components and ensuring effective implementation. Coordination with relevant thematic heads for necessary liaison.
- Coordination with all PMU staff and district level staff on actions required on EMF implementation
- Identification and coordinating hiring of Technical agencies - for promoting green business opportunities, Capacity building and monitoring, Green standards and certification etc. and coordinating with the agencies for ensuring better and timely performance.
- Identifying partners for support on need basis and building partnerships at state and district levels. Exploring convergence opportunities with line departments and implementation.
- Providing any EMF related support to PMU, District units and technical agencies for smooth implementation
- To monitor the progress of EMF implementation through regular monitoring.
- Documentation of best practices in EMF implementation
- Any other that emerges based on the need.

Duration of assignment:
This assignment is for five years from the date of contract.

Reporting:
The agency will report to CEO, SERP and any thematic head assigned.

Eligibility:
The person should have an experience of 10 years in natural resource management for sustainable rural livelihoods. He or she should have both field and programme management experience. Should have working experience with community at least for 5 years. Experience of working with Government is desirable. The person should have a master's degree in the following fields: Agriculture, Horticulture, Forest Management, Natural Resource Management, Animal Husbandry and Fisheries, Social Work, Rural Development. Proficiency in English, Telugu and Hindi is required. Proficiency in computers is must.

2. TOR for hiring Technical Agency for development of EA tools and EMF manual, Capacity Building and Internal Monitoring of EMF implementation.

Introduction:

Society for Elimination of Rural Poverty (SERP), Proposes Andhra Pradesh Rural Inclusive Growth Project (APRIGP) which aims at supporting the SERP's goal of making the State poverty free by 2017 strategy of including poor into benefits of economic growth and this is consistent with the India Country Strategy (CAS) FY 2009-2012 and aligned with the three CAS objectives of (a) achieving rapid, inclusive growth, (b) ensuring that development is sustainable, and (*c*) increasing the effectiveness of service delivery. The project is also consistent with approach for XII Five Year Plan for a 'faster, sustainable and more inclusive growth' and growth target of 8.2 percent. The overall strategy is to look beyond growth and focus on generation of employment to the millions of the youth in the State. This would eventually result in a faster reduction in unemployment and poverty through skill development and also help bridging multiple divides.[38] Finally, the project also supports the GoI's "Finance Plus" approach by investing in building community institutions that can foster higher order impacts, bringing various schemes together on to one synergistic platform (gender, nutrition, education and livelihoods), improving service delivery in a sustainable manner, innovations and pilot approaches, besides leveraging financing from public and private sources through convergence and partnerships.

The objective of Andhra Pradesh Rural Inclusive Growth Project (APRIGP) is 'to enable selected poor households to diversify and enhance sources of income and secure increased access to human development services and social entitlements'.

This will be achieved by supporting Government of Andhra Pradesh (GoAP) in consolidating the rural poverty reduction initiatives under previous IDA supported projects (Andhra Pradesh District Poverty Initiatives Project and Andhra Pradesh Rural Poverty Reduction Project) with an emphasis on inclusive growth and livelihoods sustainability.

A very brief description of the project components is given below:

Component 1: Value Chain Enhancement through Producer Organizations:

This component will work with small and marginal producers who have built up productive assets and have previously participated in productivity improvement and technology introduction programs. This component will have two sub-components viz. Rural Value Chains and Rural Retails Chains/Small Enterprises.

Component 2 - Human Development:

This component will invest in 'lifecycle approach' through targeted mobilization of poor households for achieving MDGs in health and education leveraging the existing community institutional network. This would include special packages for tribal areas in the State.

Component 3 - Access to Entitlements:

Access to social safety nets and entitlements will be the core agenda in the strategy for inclusion of the poorest households. This component will invest in leveraging existing institutional platform to ensure

[38] Socio-Economic Survey 2011-2012; Department of Planning, Government of Andhra Pradesh, March 2012

reliable and universal access to entitlements and public services (like food security, MNREGS, social pensions, scholarships, etc.).

Component 4: TA, ICT & Partnerships:
The objective of this component will be to improve the performance of project implementation and enhance coordination mechanisms with supply/demand side partner institutions by providing them technical assistance, strategic advisory and knowledge management services. The project will encourage productive partnerships to increase the integration of poor in performing and remunerative value chains.

Component 5 - Project Implementation Support:
The objective of this component is to strengthen the project implementation and will finance dedicated staffing for the project activities that are attributable to outcomes of the project, consultancies, training and related material, office equipment, and operational costs. It will also support establishing Monitoring, Evaluation and Learning (MEL) systems, Financial Management systems, Procurement Management, Governance and Accountability Systems, Knowledge Management and Communication, etc.

For more details on the project refer to Project Implementation Plan (PIP).

Background Analysis:

The Environment Management Frame Work (EMF) for the APRIGP is an integral part of the implementation arrangements related to activities concerned with environmental implication. An Environment study was undertaken and an Environment Management Framework has been developed for the APRIGP to ensure that interventions of projects are environmentally sustainable and compliance with applicable laws and regulations of the Government of India, the Government of Andhra Pradesh and triggered safeguard policies of the World Bank.

The EMF is applicable to all components of the project in general and particularly to 'Value chain enhancement through producer organizations' and 'Human Development' components as the activities proposed under these two components are likely to have a bearing on the surrounding environment.

The objective of the project is to bring in numerous livelihood activities that would help the federations and the producer groups to increase their household incomes. Meanwhile it is very important to keep in mind that all the livelihood interventions by the federations and producer groups should be compliant with the laws and regulations of the country and the state i.e. the legal and regulatory frameworks based on Government of India and Government of Andhra Pradesh and Safeguard policies of World Bank. Compliance with these rules and regulations ensure alignment of these investments with sustainable management of resources. Also the environmental benefits accrued will bring in economic enhancement in terms of premium for the green production process and produce. Also the interventions under Human development component such as drinking water provision, nutrition and sanitation will have environmental implications. Integration environment sustainability measures into these interventions is required.

The EMF implementation will be through the process of integration of environmental guidelines into the plans developed by the community under each component, Environment Appraisal of the plans developed for verifying the integration of environment guidelines and ensuring the implementation of

specified guidelines and measures. An EMF manual and Environment Appraisal (EA) tools will be developed to screen the activities for any adverse impact on environment and to check the compliance with WB safeguard policies and legal and regulatory frame work of GOI and GOAP. Environmental Guidelines Suggests alternatives for mitigating potential risks and suggest negative list for both the component 1 and 2.

Monitoring (through green audits) for the compliance is very critical for smooth implementation of EMF and to enhance the income levels of the beneficiaries by exploring business opportunities for fair trade, clean development mechanism etc.

Scope of Assignment:
The assignment is expected to develop EMF manual in local language, developing EA tools, Capacity Building modules for community and staff at different levels and IEC materials and video films on greening value chains and green business opportunities. It also includes conducting the capacity building programs and internal monitoring of the implementation of environment management frame work (EMF).

Objectives:

- Develop operational manual on EMF in local language
- EA tools and guidelines in local language,
- Information Education and Communication (IEC) material and Capacity Building (CB) modules for APRIGP functionaries, Green Community Professionals, Front Line Workers (FLW) of HD component. and Producer Groups
- To deliver the capacity building programmes at State and cluster levels
- To monitor the progress of EMF implementation through yearly internal audits.

Key Tasks and Responsibilities:

Developing EMF manual:
The technical support agency is expected to develop an operational manual on EMF in line with the framework developed for the project.
Environment Appraisal (EA) tools and Guidelines:
Environment Appraisal (EA) tools are to be developed for the list of activities (please refer to EMF document for details) proposed under Value chain and Human Development components to screen the activities for any adverse impact on environment and to check the compliance with WB safeguard policies and legal and regulatory frame work of GOI and GOAP. Environmental guidelines to Suggest alternatives for mitigating potential risks are to be part of the tools. The agency is expected to develop simple EA tools and Guidelines which can be used by community professionals and Farmer Producer Organisation (FPO) leaders. Further these tools should be useful as monitoring tools for accessing carbon credits, premiums for fair trade/ethical farming, green business etc. so that the beneficiaries can accelerate their incomes.

IEC material:

Agency is expected develop and print following IEC material to be placed in offices of FPOs, K marts or office of the enterprises, Village Organisations, and to be used by green Community resource person who are the community facilitators for implementation of EMF.

- Booklets on value chains for all 10 commodities – Agriculture, Livestock and Knitting of Rural Self Help Enterprises (KRuSHE) enterprises and Marts (list of value chains and enterprises is provided in EMF document)
- Posters or calendars on environmental guidelines for various commodities (commodity wise posters) –10
- Posters or calendars on sustainable dairy, small ruminant, poultry fisheries management. - 4
- Posters or calendars in environmental aspects in farm based and nonfarm enterprises - 10.
- Posters or calendars on safe drinking Water - 2
- Posters or calendars on Sanitation -2

Capacity Building modules:

Capacity building modules are expected to cater the needs of capacity building of project teams at different levels, Spear Head teams (SHTs) who operate at cluster level, FPO leaders, micro entrepreneurs and Green Community Resource Persons & Front Level Workers under HD component . Capacity building modules should cover value chains (agriculture, livestock, micro enterprises) and thematic areas in Human Development component

1. Sustainable agriculture, Livestock management etc.
2. Environmental issues and in the selected value chains commodities
3. Impacts of Climate Change on Rural livelihoods, adaptation measures
4. Environmental issues in micro enterprises
5. Environment guidelines for safe drinking water, deflouridation and sanitation

Delivery of Capacity Building Programmes:

Agency is expected to provide intensive capacity building programs for various stake holders. SERP will support the agency in organizing capacity building programs in terms of mobilizing the target groups. The training would involve class room sessions and field visits. Capacity building program should include video films on Environment Appraisal.

The target groups and frequency of trainings is:

State level orientation for Project Management Unit: 1 orientation followed by refresher once every year.

State level staff (project teams): 1 main training and yearly refresher trainings for four years

Cluster level staff (project teams, selected Community Resource Persons, FLWs of HD component): 1 main training and yearly refresher trainings for four years.

Video films on Environment Assessment (EA) and green business opportunities:

Agency is expected to produce at least one video film on EA each value chain, micro enterprises, K marts and Human development component. Further the agency is expected to produce video films on green business opportunities which can accelerate incomes of the beneficiaries.

Internal monitoring (Green audits):
Agency is expected to do desk review of 10% of value chains per cluster and field visits to 10% of VPGs covering different commodities and preparing feedback report to FPOs and SERP. Exact sample could be finalized in discussion with PMU. Agency is expected to deliver monitoring reports (green audit reports) in such a way that FPOs should able to access carbon credits or premiums under fair trade, ethical trade etc.

Output and timeline:

Out put	**Expected time line**
Development and printing of EMF manual and booklets (local language)	First six months
Development of EA tools (local language) IEC material	First six months, Year 1
Capacity building Modules	First Six months
Capacity building programs for state teams	First six months
Capacity building programs for SHTs, FLWs /Project staff	First nine months
Development of video films on EA and green business opportunities	First 12 months
Refresher trainings	Yearly once
Monitoring	Once in every year from second year onwards

Duration of assignment:
This assignment is for five years from the date of contract.

Reporting:
The agency will report to CEO, SERP and the thematic heads. Coordination point will be State Environment Expert

Eligibility Criteria:

- The agency should have proven experience (5-10 years) in context of environment and rural livelihoods. The agency should have experience in working with rural communities on natural resource management for sustainable livelihoods.
- Should have experience of working with Government.
- Should have presence/reach in all the districts.

Key Human Resource Requirements with profile:
A 3 member dedicated task team (including a team leader) is required. The team leader should have an experience of 10 years and the team members at least 5 years in natural resource management for sustainable livelihoods, water and sanitation. The team should have both field and programme management experience.

The team members should have a master's degree in the following fields: Agriculture, Horticulture, Forest Management, Natural Resource Management, Animal Husbandry and Fisheries, Social Work, Rural Development.

3. Inputs for TOR for hiring Technical Agency for Setting Green Standards for enabling Economic enhancement through green marketing.

Introduction:

Society for Elimination of Rural Poverty (SERP), Proposes Andhra Pradesh Rural Inclusive Growth Project (APRIGP) which aims at supporting the SERP's goal of making the State poverty free by 2017 strategy of including poor into benefits of economic growth and this is consistent with the India Country Strategy (CAS) FY 2009-2012 and aligned with the three CAS objectives of (a) achieving rapid, inclusive growth, (b) ensuring that development is sustainable, and (*c*) increasing the effectiveness of service delivery. The project is also consistent with approach for XII Five Year Plan for a 'faster, sustainable and more inclusive growth' and growth target of 8.2 percent. The overall strategy is to look beyond growth and focus on generation of employment to the millions of the youth in the State. This would eventually result in a faster reduction in unemployment and poverty through skill development and also help bridging multiple divides.[39] Finally, the project also supports the GoI's "Finance Plus" approach by investing in building community institutions that can foster higher order impacts, bringing various schemes together on to one synergistic platform (gender, nutrition, education and livelihoods), improving service delivery in a sustainable manner, innovations and pilot approaches, besides leveraging financing from public and private sources through convergence and partnerships.

The objective of Andhra Pradesh Rural Inclusive Growth Project (APRIGP) is 'to enable selected poor households to diversify and enhance sources of income and secure increased access to human development services and social entitlements'.

This will be achieved by supporting Government of Andhra Pradesh (GoAP) in consolidating the rural poverty reduction initiatives under previous IDA supported projects (Andhra Pradesh District Poverty Initiatives Project and Andhra Pradesh Rural Poverty Reduction Project) with an emphasis on inclusive growth and livelihoods sustainability.

A very brief description of the project components is given below:

Component 1: Value Chain Enhancement through Producer Organizations:

This component will work with small and marginal producers who have built up productive assets and have previously participated in productivity improvement and technology introduction programs. This component will have two sub-components viz. Rural Value Chains and Rural Retails Chains/Small Enterprises.

Component 2 - Human Development:

This component will invest in 'lifecycle approach' through targeted mobilization of poor households for achieving MDGs in health and education leveraging the existing community institutional network. This would include special packages for tribal areas in the State.

Component 3 - Access to entitlements:

Access to social safety nets and entitlements will be the core agenda in the strategy for inclusion of the poorest households. This component will invest in leveraging existing institutional platform to ensure

[39] Socio-Economic Survey 2011-2012; Department of Planning, Government of Andhra Pradesh, March 2012

reliable and universal access to entitlements and public services (like food security, MNREGS, social pensions, scholarships, etc.).

Component 4: TA, ICT & Partnerships:
The objective of this component will be to improve the performance of project implementation and enhance coordination mechanisms with supply/demand side partner institutions by providing them technical assistance, strategic advisory and knowledge management services. The project will encourage productive partnerships to increase the integration of poor in performing and remunerative value chains.

Component 5 - Project Implementation Support:
The objective of this component is to strengthen the project implementation and will finance dedicated staffing for the project activities that are attributable to outcomes of the project, consultancies, training and related material, office equipment, and operational costs. It will also support establishing Monitoring, Evaluation and Learning (MEL) systems, Financial Management systems, Procurement Management, Governance and Accountability Systems, Knowledge Management and Communication, etc.

For more details on the project refer to Project Implementation Plan (PIP).

Background Analysis:

APRIGP will be investing in rural value chains, rural retail chains and human development. This project aims at greening the value chains and rural retail chains to enhance incomes through accessing premiums for fair trade, carbon trade, ethical farming etc. SERP started several green initiatives like community managed sustainable agriculture, participatory guarantee system for internal certification etc and now want to build on these existing initiatives to accelerate the growth of the producers and individual entrepreneurs.

APRIGP has formulated an Environment Management Framework (EMF) to ensure compliance with World Bank operational and safe guard policies and legal and regulatory frame work of government of India and AP. Apart from compliance the EMF will eventually lead to environmentally sound and sustainable value chains. EMF will ensure screening of the activities to avoid any adverse effects on the environment and natural resources. EMF will ensure greening of value chains in each step of the value chain from the beginning of the project. It proactively works towards positive impacts on environment. APRIGP will extensively work on carbon trading, fair trade, ethical farming, green labeling and marketing with inbuilt EMF.

Scope of Assignment:

Setting standards for 'Green Rating' of the value chains (selected commodities in agriculture commodities, livestock and micro enterprises) and other components through life cycle approach especially in productivity enhancement - green initiatives like non pesticide management, sustainable agricultural practices etc. and in processing for energy efficiency, water use efficiency etc. SERP will extensively promote the environment friendly alternatives in the value chains through demonstration, trainings and implementation support. The package of interventions are outlined in the EMF document prepared by SERP and under Community Managed Sustainable Agriculture (CMSA) component.

Suggesting any additional environmentally sustainable practices with specific to the value chains is also part of the assignment.

The standards for 'Green Rating' of the value chains, micro enterprises and other components should enable the Producer groups to access premiums through carbon trading, fair trade, ethical farming etc. Developing user friendly 'Green Rating' tools for rating which can be used by the project for internal audits will be part of the assignment.
The concept and green rating standards specific to each intervention (value chains) and the tools should be presented in the form of a user manual.

Objectives:

- Develop a set of standards for 'green rating' of the agriculture commodity, livestock and micro enterprises specified under the project. Developing green rating criteria for Human development component.
- Developing 'green rating' tools that can be used by field staff in rating the project interventions (after an orientation)
- Preparing a manual with standards and tools
- Exploring the options for tie up for premiums under carbon trading, fair trade, ethical farming, green labeling etc. and suggestion on marketing
- Providing inputs for developing a traceability mechanism for consumer confidence.

Key Tasks and Responsibilities:

Developing green standards:
The agency is expected develop standards for each value chain, retail chains and human development components which would make the produce, products and commodities so that they are eligible for accessing premiums under carbon credits, fair trade, ethical farming etc.

Tools for green certification:
Agency is expected to develop simple but effective tools to assess the value chains against the preset green standards. Tools should be user friendly so that the field staff, community professionals and farmer Producer Group leaders will use these for internal monitoring.

Traceability mechanism:
Agency is expected to support in developing software for tracing the produce to gain the trust of the consumers.

Support in the content for Capacity Building programme**:**
The Agency is expected to provide content support for capacity building the field staff and Community Resource Persons on green ratings and standards.

Output and timeline:

Out put	**Expected time line**
Setup green business standards	By month 6
Tools for green certification	By month 6
Capacity building content	6-8 months
Support for Traceability mechanism - ICT application	6-8 months

Duration of assignment:
Assignment is for a period of 8 months.

Reporting:
The agency will report to CEO, SERP and the thematic heads. The coordination point will be State Environment Expert.

Eligibility Criteria:

- The agency should have proven experience (5-10 years) in context of green certification, carbon trading, fair trade etc
- Should have experience of working with Government on Community related interventions, especially on sustainable agriculture and rural enterprises.
- Should have liaison or be able to liase with organic or green market groups
- Should have worked on traceability mechanisms

Key Human Resource Requirements with profile:
A five member dedicated task team (including a team leader) is required. The team leader should have an experience of 10 years and the team members at least 5 years in green certification.

4. Inputs for TOR for hiring Technical Agency for conducting Green Audits and Certification for enabling Economic enhancement through green marketing.

Introduction:

Society for Elimination of Rural Poverty (SERP), Proposes Andhra Pradesh Rural Inclusive Growth Project (APRIGP) which aims at supporting the SERP's goal of making the State poverty free by 2017 strategy of including poor into benefits of economic growth and this is consistent with the India Country Strategy (CAS) FY 2009-2012 and aligned with the three CAS objectives of (a) achieving rapid, inclusive growth, (b) ensuring that development is sustainable, and (*c*) increasing the effectiveness of service delivery. The project is also consistent with approach for XII Five Year Plan for a 'faster, sustainable and more inclusive growth' and growth target of 8.2 percent. The overall strategy is to look beyond growth and focus on generation of employment to the millions of the youth in the State. This would eventually result in a faster reduction in unemployment and poverty through skill development and also help bridging multiple divides.[40] Finally, the project also supports the GoI's "Finance Plus" approach by investing in building community institutions that can foster higher order impacts, bringing various schemes together on to one synergistic platform (gender, nutrition, education and livelihoods), improving service delivery in a sustainable manner, innovations and pilot approaches, besides leveraging financing from public and private sources through convergence and partnerships.

The objective of Andhra Pradesh Rural Inclusive Growth Project (APRIGP) is 'to enable selected poor households to diversify and enhance sources of income and secure increased access to human development services and social entitlements'.

This will be achieved by supporting Government of Andhra Pradesh (GoAP) in consolidating the rural poverty reduction initiatives under previous IDA supported projects (Andhra Pradesh District Poverty Initiatives Project and Andhra Pradesh Rural Poverty Reduction Project) with an emphasis on inclusive growth and livelihoods sustainability.

A very brief description of the project components is given below:

Component 1: Value Chain Enhancement through Producer Organizations:

This component will work with small and marginal producers who have built up productive assets and have previously participated in productivity improvement and technology introduction programs. This component will have two sub-components viz. Rural Value Chains and Rural Retails Chains/Small Enterprises.

Component 2 - Human Development:

This component will invest in 'lifecycle approach' through targeted mobilization of poor households for achieving MDGs in health and education leveraging the existing community institutional network. This would include special packages for tribal areas in the State.

Component 3 - Access to entitlements:

Access to social safety nets and entitlements will be the core agenda in the strategy for inclusion of the poorest households. This component will invest in leveraging existing institutional platform to ensure

[40]Socio-Economic Survey 2011-2012; Department of Planning, Government of Andhra Pradesh, March 2012

reliable and universal access to entitlements and public services (like food security, MNREGS, social pensions, scholarships, etc.).

Component 4: TA, ICT & Partnerships:
The objective of this component will be to improve the performance of project implementation and enhance coordination mechanisms with supply/demand side partner institutions by providing them technical assistance, strategic advisory and knowledge management services. The project will encourage productive partnerships to increase the integration of poor in performing and remunerative value chains.

Component 5 - Project Implementation Support:
The objective of this component is to strengthen the project implementation and will finance dedicated staffing for the project activities that are attributable to outcomes of the project, consultancies, training and related material, office equipment, and operational costs. It will also support establishing Monitoring, Evaluation and Learning (MEL) systems, Financial Management systems, Procurement Management, Governance and Accountability Systems, Knowledge Management and Communication, etc.

For more details on the project refer to Project Implementation Plan (PIP).

Background Analysis:

APRIGP will be investing in rural value chains, rural retail chains and human development. This project aims at greening the value chains and rural retail chains to enhance incomes through accessing premiums for fair trade, carbon trade, ethical farming etc. SERP started several green initiatives like community managed sustainable agriculture, participatory guarantee system for internal certification etc and now want to build on these existing initiatives to accelerate the growth of the producers and individual entrepreneurs.

APRIGP has formulated an Environment Management Framework (EMF) to ensure compliance with World Bank operational and safe guard policies and legal and regulatory frame work of government of India and AP. Apart from compliance the EMF will eventually lead to environmentally sound and sustainable value chains. EMF will ensure screening of the activities to avoid any adverse effects on the environment and natural resources. EMF will ensure greening of value chains in each step of the value chain from the beginning of the project. It proactively works towards positive impacts on environment.

APRIGP will extensively work on carbon trading, fair trade, ethical farming, green labeling and marketing with inbuilt EMF. To achieve this at inception of the project period ‘Green Standards’ will be set specific to each value chain and interventions on Human development components. Green rating tools will also be developed for each value chain or interventions for rating and certification of the produce, commodities or interventions.

Scope of Assignment:

Conducting Environment Audits or Green Audits of the value chains and other components once every year against the pre set green standards using the green rating tools prepared. The audits should follow life cycle approach especially covering productivity enhancement (green initiatives like non pesticide management, sustainable agricultural practices etc.) and processing (energy efficiency, water use efficiency etc.) and storage and transport. Followed by every green audit the qualifying value chain commodities and producer groups should be certified for linking with green market. The green rating and certification also should have feedback mechanism integrated into it.

Rating of the value chains, micro enterprises and other components should enable the Producer Groups to access premiums through carbon trading, fair trade, ethical farming etc .The agency should be able to link the certified products with the existing green markets within and Outside India.

Objectives:

- Conducting Green Audits and green ratings for all the value chains once every year or cycle (or crop season which ever may be relevant)
- Third party certification for the green initiatives - produce, products etc.
- Providing commodity wise or Producer group wise reports
- Exploring the options and tie ups for premiums under carbon trading, fair trade, ethical farming, green labeling etc. and suggestion on marketing
- Providing inputs for developing a traceability mechanism for consumer confidence.

Key Tasks and Responsibilities:

Green Audits and certification:
Agency should do regular "green auditing 'to all the value chains (on sampling basis) and other components at yearly intervals or once in crop seasons whichever is relevant. Qualified Groups should be provided with certification to enable the beneficiaries to access premiums through carbon trading, fair trade, green business opportunities etc. Commodity wise reports should be provided at end of every year or season.

Support in accessing premiums:
Followed by certification the agency is expected to support the Producer Groups to liase with the green markets to accessing premiums.

Traceability mechanism:
Agency is expected to support in develop software for tracing the produce to gain the trust of the consumers.

Feedback:
After every green audit the agency should provide detailed feedback reports. Should also provide suggestions and content support on further capacity building in cases where required.

Output and timeline:

Out put	Expected time line
Green audit, certification, support in traceability mechanism and market links. Detailed feedback report.	Year 2
Green audit, certification, support in traceability mechanism and market links. Detailed feedback report.	Year 3
Green audit, certification, support in traceability mechanism and market links. Detailed feedback report.	Year 4
Green audit, certification, support in traceability mechanism and market links. Detailed feedback report.	Year 5

Duration of assignment:
Assignment is for a period of 4 years.

Reporting:
The agency will report to CEO, SERP and the thematic heads. The coordination point will be State Environment Expert.

Eligibility Criteria:

- The agency should have proven record (5-10 years) in context of green audits, certification, carbon trading, fair trade etc
- Should have experience of working with Government on Community related interventions, especially on sustainable agriculture and rural enterprises.
- Should have liaison or be able to liaise with organic or green market groups
- Should have worked on traceability mechanisms

Key Human Resource Requirements with profile:
A five member dedicated task team (including a team leader) is required. The team leader should have an experience of 10 years and the team members at least 5 years in green audits, certification and green marketing.

5. Inputs for TOR for ICT for Environment Management Framework (EMF) –to be included by SERP in ICT ToR

Functionality: Environment Management Framework

Coverage: Application for EMF is required for all value chains, retail outlets and human development components.

Outputs required:
A**.** Environment screening
B. Environment Appraisal
C. Tools for green certification
D. Tractability of the value chain products
E. Knowledge management for greening value chains and business management

Modules in the application:

Environment screening:
Check list for screening for any potential adverse impact on environment (legal and regulatory requirement). Application should support Farmer Producer Organisation (FPOs) or Producer Group leaders, Green Community Resource Persons (CRPs) to take a decision on whether they can invest in this activity.

Environment Appraisal:
Environment Appraisal (EA) tools to screen the activities for any adverse impact on environment and to check the compliance with WB safeguard policies and legal and regulatory frame work of GOI and GOAP. Environment Guidelines will also be given to identify potential risk and suggests alternatives for mitigating the risk. The agency is expected to develop simple EA tools (based on the content provided in EMF document) which can be used by community professionals and FPO leaders. Further these tools should be useful for internal monitoring & audits and for accessing carbon credits, premiums for fair trade/ethical farming, green business etc. so that the beneficiaries can accelerate their incomes.

Application will have multiple tools based on the value chain, retail chain, micro enterprise etc. This application should help the users in assessing the impact on environment and provide mitigation measures for the risk identified.

Tools for green certification:
Tools will be designed to assess the value chains against green standards. Tools should be user friendly so that the community professionals and FPO leaders will use these for internal monitoring (green audits).

Application will have multiple tools for quantification of greening of the value chain. This application will help in accessing premium through carbon trade, fair trade, ethical farming, green business opportunities etc.

Traceability of the value chains:
This application should provide documental evidence for Green Business requirements. It also should provide details of the value chain like who are involved, process and technologies using in the value chains to the consumers. It will help in building the trust among the consumers.

Knowledge Management:
ICT tools such as Video films, IEC materials on EA tools, green business initiatives, green value chains etc to be provided in the public domain.

New device requirements:
Tablets are required at FPO level. (Green CRPs).

Analytics requirements:

Dash boards:

State level:
Green certification details
Status greening value chains
Internal audits and third party monitoring (seasonal) – Village, cluster levels
Capacity building programme details – State level, Cluster level, CP, FPO level

District level:
Green certification details
Status of greening value chains (Business Plans)
Internal monitoring – Village, cluster levels
Capacity building programme details - Cluster level, CP, FPO level

FPO level:
Green certification details by third party monitoring
Status of EA for value chains and other activities
Internal monitoring – PG level
Capacity Building Programmes – FPO level