

Value chain in Natural Dye

Environmental and Social Safeguards Management in NAIP

A. Basic information

1. Project statistics

Component Code	: 2
Name of the Consortium leader	: Dr P. Raghava Reddy
Name of CPI	: Dr. A. Sharada Devi
Institution	: Acharya N.G. Ranga Agricultural University, Rajendranagar, Hyderabad, Andhra Pradesh
Mailing Address	: Professor and Univ. Head, Department of Apparel & Textiles, College of Home Science, Saifabad, Hyderabad
Associate CPIs	: 1. Dr. P. Amala Kumari Associate Professor, 2. Dr. G.P. Sunandini, Senior Scientist (Ag. Econ)
Consortium Partners	: Shyamal Handlooms, Chirala, Prakasham District, A.P
2. Date of Start	: 01.06.08
3. Planned Duration	: Four years
4. Project cost	: Rs. 345.95 lakhs

5. Project objectives:

1. To Standardise eco-friendly cost effective natural dye production, processing, colour fastness and shade reproducibility technologies
2. To develop entrepreneurial skills of stake holders in natural dye value chain
3. To establish small scale pilot plants to promote natural dye value chain
4. To ensure additional employment and income, through national and international market networking in the field of textiles, handicrafts and surface paints
5. To develop quality parameters for natural dye end use products

6. Brief project description

The project entitled 'Value Chain in Natural Dyes' will be carried out by the Lead Institute Acharya NG Ranga Agricultural University and one private partner M/S Shyamal Handlooms. The partner is chosen based on its competency in the field of natural dye products.

Integrated Tribal Development Agency, Rampachodavaram (Organizing the tribal groups in collection, processing and product development) , KVK, Rajahmundry (training), Commissionerate of Handlooms, Govt of AP (cluster identification for training), Weavers' Service Centre, Hyderabad ,Pochampally Handloom Park (natural dyed handlooms), Craft Council of India A.P Chapter (natural dyed handicrafts) and Krishna Reddy Kalamkari arts, Kalahasthi Natural Dye Prints(pen kalamkari products) will be involved as associate parterres.

Broadly the project consists of collection and cultivation of natural dye sources, processing for dye extraction, standardization of technologies for making different endues products and marketing

The project comprises of 5 dimensions of natural dye with different objectives & activities.

The first objective deals with standardization of natural dye technologies addressing the existing gaps in the value chain. Primarily it deals with procurement & processing of natural dyes for various end uses to ensure continuous supply of dye material for commercial production. The major interventions are technology standardization, enhancement of colorfastness in natural dye products, production of natural dye concentrates for commercial dye availability to contribute to supply chain management. The natural dye sources that give rise to spectrum of colors are identified and activities related to collection, cultivation & product making of these are planned to enhance the value chain. Seeds of improved varieties are supplied to targeted tribal farmers for production.

The second objective focuses on training of various stakeholders and entrepreneur development for promotion of natural dye value chain. Short term training programmes are planned to motivate farmers & tribal self help groups in selection, collection & cultivation of dye sources & their post harvest practices. Long term training programmes of 30 – 45 days duration are planned to impart entrepreneurial skills to weavers & artisans involved in textile, handicraft & surface coating industries. Developing training modules and assessment of impact of training helps in further promotion.

The third objective deals with establishment of small scale pilot plants for dye extraction & production cum training centers for making natural dye end use products. The primary processing plant will supply the dye in concentrated form to overcome the drudgery and time- intensive method of dye preparation for commercial production of end use products. The plant will also make the dye processing cost effective as it is located in a place of abundant supply of natural dye sources. The production centers facilitate up-scaling of natural dyed products for commercial use. Based on the inputs from market survey, wide spectrum of value added products in the areas of textiles, handicrafts & surface coating will be promoted with emphasis on good packaging and labeling for both domestic and export markets. Utilization of waste as bio fertilizer will also be encouraged as a means of additional income.

The fourth objective is to promote market linkages through networking of national and international markets to ensure additional employment and income to the stakeholders. Potential products will be identified and refined in terms of consumer usage and attractive packaging to suit niche and other markets. Studies are planned to assess the economic feasibility and consumer acceptance of the natural dyed products and market strategies. Awareness programmes to educate the consumers regarding the merits of eco-friendly natural dyes will also be conducted with the aid of print and electronic publicity material. As social

and policy matters are involved, line departments of both state and central government and industries will be sensitized through exhibitions, workshops and design shows. Innovative approaches of popularization and commercialization will be adopted to attain the goal of establishing and promoting the value chain. Networking of the stakeholders from production to consumption will also be taken care of.

The fifth objective is to develop quality parameters for natural dye products and branding for promotion of value chain. Technology will be developed for identification of natural dye pigment specific on textiles, handicrafts and surface coatings for accurate assessment of end-use products. This supports establishment of branding parameters, procedures and thereby policy by GoI to encourage National and International marketing. As the project has production activity also, branding will initially be done in stakeholder clusters.

Natural dyes are obtained from renewable resources and the usage of these dyes contributes to the conservation of the nature. As the pigment content in these dyes is very low, a lot of source material is required. Natural dyes are not marketed in large quantities as these dyes are consumed only by few specified groups. In Andhra Pradesh natural dyes are not cultivated for the purpose of preparing the dye. A lot of varieties that give rise to good colours are present in the forests and other waste lands. Collection of these dyes will not only provide livelihood to rural and tribal people but also make the dye ready for promoting value chain in natural dyes. The major gaps found in this production to consumption value chain are improper management of natural dye sources, poor adopted technology, lack of commercial availability of natural dyes and its products, limited awareness levels amongst different end-user segments, lack of standards for quality and eco-friendly certification of Natural dyes.

To fill the gap of raw material availability, it is planned to collect and cultivate few varieties of natural dyes specific to the state of Andhra Pradesh. Varieties such as indigo, bixa and marigold will be cultivated for the purpose of producing the dye. Packages of practices will be developed for these crops in A.P. The sources of abundant availability in AP are identified for collection from the tribal belt. These include Butea gum, Arjun bark, Sappan wood, Myrobalan, Eucalyptus bark, Eclipta prostrata, Butea monosperma. As cultivation of indigo, bixa and other dye yielding crops are more beneficial to the farmers, awareness programmes will be conducted to motivate them. The processing of indigo dye from the plant mass needs to be standardized for getting quality cake which has tremendous demand in the market. Pilot plant for indigo processing will be established and experiments will be conducted for commercialization of the process at Utukur, Cuddapah dt.

The optimized process of colouring cotton, silk, wool, banana and mesta fibres with natural dyes will enhance the use of these dyes in apparels and also carpet industry. The problems of fair colour fastness and reproducibility will be addressed through characterisation of the dye, enzyme pretreatment, standardization of the process, after treatments, use of nanotechnology etc. Pilot plants for extraction of natural dyes on small scale will be established in place of abundance (Rampachodavaram). Training cum production centres will be established at Chirala (textiles & paints), Amudalavalasa (Mesta handicrafts & eco-powders), Utukoor (eco-powders). Similar programmes will also be conducted at KVK, CTRI Kalavacharla, Rajahmundry, E.G. Dt., by utilizing their infrastructure.

The private partner is M/S Shyamal Handlooms. The roles of each consortium partners are well defined and the logistics are planned. A comprehensive methodology is

worked out to achieve the objectives planned. Apart from planning, coordinating and monitoring of all the activities concerned to the project, ANGRAU, the main consortium leader will undertake research to standardize the procedures of colouring textiles, handicrafts and surface coatings, addressing the problems faced. RAS Utukur will take up the cultivation and processing of indigo with the intervention of the Consortium leader. Training of the farmers will also be taken up by them. ITDA as Associate partner will undertake organizing tribal groups in collection of natural dye sources and marketing them. ITDA also supports for establishment of pilot plant for extraction of natural dyes in the form of providing land and shed and monitoring the unit. Up scaling will be taken up by them through duplication of these plants in other areas.

Farmers, tribals, small-scale processors, women groups, SHG's, new entrepreneurs, etc., will be empowered to take advantage of new market opportunities emanating from branding and popularization of natural dye products from fashion field. Innovative approaches of popularization and commercialization will be adopted to attain the goal of establishing and promoting the value chain. Consumers of various markets will be educated on natural dye products with competitive pricing.

Thus the value-chain model will address important issues such as continuous supply of sources to the processors for uninterrupted production and supply to the national and international markets. The underlying social aspects of the project are ecological balance, additional employment and income generation through alternative livelihoods. Tapping both wide spread markets and niche markets is planned through entrepreneurship development and innovative approaches in popularization. . It will be done with an active participation of stakeholders which may thus result in emergence of a viable and replicable model of value-chain.

7. Environmental category issues in the subproject (A+B)

- Social
- Environmental

8. Safeguard policies triggered (World Bank policies)

Safeguard Policies Triggered (World Bank Policies)	Yes	No
Environmental Assessment(OP/BP 4.01)	[x]	[]
Natural Habitats (OP/BP 4.04)	[]	[]
Pest Management (OP 4.09)	[]	[]
Cultural Property (draft OP 4.11-OPN 11.03 -)	[]	[]
Involuntary Resettlement (OP/BP 4.12)	[]	[]
Indigenous Peoples (OD 4.20)	[]	[]
Forests (OP/BP 4.36)	[]	[]
Safety of Dams (OP/BP 4.37)	[]	[]
Projects in Disputed Areas (OP/BP 7.60)	[]	[]
Projects on International Waterways (OP/BP 7.50)	[]	[]

B. Risk analysis and related issues

- Adoption of improved package of practices may be slow due to the prevalence of age old traditional practices

- Artisans may not accept readily for receiving long term skill training as they are displaced temporarily from their bread winning jobs
- Commercial production of natural dye products
- Consumer's response to the natural dye products may be slow due to high price
- Logistic problems are anticipated as the developed models are tried for the first time
- Marketing of natural dye products may become difficult if the products are not made cost effective

9. Impact Assessment

The following columns provide the impact through addressing the issues adequately

10. Potential indirect and / or long-term impacts due to anticipated future activities in the project areas (assessment of anticipated conflict/ complimentarily with the current as well as those proposed for the next five years in the areas of activities of the sub-project):

- Natural dye products slowly replace the synthetic dye products
- Export of the natural dye products will be initiated due to increased production potential
- Availability of drudgery relieving tools that are women friendly
- Utilisation of biomass from the forests helps in maintaining ecological balance
- Promotion of natural dyes provides safety to the human skin
- Entrepreneurial activities will be promoted among women groups which helps in controlling the urban migration
- Availability of trained / skilled workers in processing / making natural dye products
- Improved quality of living of tribal groups if this developed ecological model is replicated in other tribal belts.

11. Identify the key stakeholders and describe mechanisms for consultation with and to them done/ disclosure so far done including pre-project consultation with stakeholders workshop before formulating the full proposal, discussing the full proposal with some stakeholders before submission to PIU:

Public institutions :

1. Integrated Tribal Development Agency, Rampachodavaram
2. Commissionerate of Handlooms, Govt of AP, Hyderabad
3. Krishi Vigyan Kendra, CTRI, Kalvacherla, Rajahmundry, E.G dt, A.P
4. CIRCOT, Mumbai
5. Farmers and consumers in the project area
6. Weavers' Service centre, Hyderabad

Private participation:

7. Pochampally Handloom Park, Kanumukkala, Nalgonda dt, AP
8. Craft Council of India, A.P Chapter, Begumpet, Hyd
9. Krishna Reddy Kalamkari arts, Kalahasthi
10. Natural Dye Prints, Jaipur

NGOs:

11. Byrraju Foundation, N.G.O, Hyderabad

International institutes:

12. Maiwa Institute of Natural Prints, MAIWA

Prior to stakeholders' workshop, prologue discussions were held with few stakeholders involved in research, production, conversion, promotional, commercial activities related to natural dyes. The concept, objectives & expected output & impacts of NAIP project was made clear to all the stakeholders. The eventual modalities will be worked out after the project approval.

Chronology of meetings/ activities held in connection with preparation of the concept note & full proposal:

S. No.	Date & location	Programme	Participants	Remarks
1.	22 nd Dec 2007	Interaction with ITDA officers	State level Tribal welfare officers	To unearth the possibilities and supporting procedure for collection of natural dye sources from forests
2.	4 th Jan 2008	Interaction with scientists of ANGRAU	Horticulturists, Agronomists, Agricultural Economists, Apparel & Textile Scientists and Extension Specialists	To identify dye yielding plants and crops and existing and improved cultivation practices.
3.	11 th Jan 2008	Interaction with weavers and artisans	Weavers from Pochampally, Mangalagiri, Kalamkari	To discuss the merits and limitation associated with adoption of the technology
4.	6 th Feb 2008	Interaction with NGO's	Byrraju Foundation, Peoples Patriotic Society, Craft Council of India	To work out networking strategies for establishment of value chain right from collection to marketing.
5.	23 rd Feb 2008	Brainstorming sessions with stake holders	Weavers, Marketers, Collectors, Progressive farmers, Traders,	To know the occupational, social and financial expectations

12. Measures to address the Issues:

To address the risks anticipated, programmes will be conducted to educate the artisans and women groups, through convergence measures. Project related activities will be interwoven with the govt. development programmes to ensure the continuous supply of

natural dye sources. The user friendly training modules will be prepared in vernacular language. To support artisans during the training period, remuneration will be provided for the work carried out by them. Simple techniques will be developed to ensure the quality of the developed products.

Through print and other electronic media the natural dye products will be popularised. The proposed training cum production centres attract the enterprises for commercial production. The problem of lighter, dull shades will be addressed through development of appropriate technology including nano technology.

13. Consultation/ disclosures to be done in future:

Several measures/ mechanisms for disclosure of the information / results of the sub-project generated during the implementation period will be adopted. Launch workshops, awareness programmes, organizing exhibitions, information sharing & knowledge through trainings, dissemination of project brochures, generated pamphlets, annual reports, technical bulletins etc. provide opportunity for disclosure. The consultation / disclosures will be taken up as per the NAIP guidelines during implementation of the project.

The farmers, artisans and women self-help groups will be trained using appropriate methods such as demonstrations, real situation experiences; skill based trainings of long duration and theme & end use based workshops relevant to farmers, artisans & self help groups in areas of collection, cultivation, post –harvest practices, extraction, processing for various end use products, product making, quality assurance, packing, labeling, marketing etc.

The fruitful findings of the project will be disclosed on regular basis and necessary feed back will be collected for further refinement and implementation of the project. The following approaches are proposed.

- Dissemination of improved package of practices for cultivation of high yielding varieties to the tribal and non-tribal farmers through awareness campaigns and training programmes
- Demonstration of consumer accepted natural dye products to stake holders.
- Transfer of technology (eco-friendly and cost effective natural dyed products to stake holders)
- Innovative approaches for popularization of the merits of eco-friendly natural dye products to the consumers.
- Access to entrepreneurs, traders and consumers in use of developed natural dye electronic catalogues
- Impress on Govt to embrace the natural dye related activities under their planned programmes
- Replication of Value chain other than the project areas create demand for natural dye products

Shorada . A

Consortium PI

National Coordinator

National Director

Annexure I: Environmental safeguard: Activities, issues, impact and mitigation measures

Interventions	Anticipated level of Impacts	Issues		Mitigation measures (Negative Impact)
		Positive	Negative	
Production of indigo and marigold	1. Use of bio fertilizers and bio-pesticide	3		
Harvesting & post harvest practices	1. Reduced contamination	3		
	2. Reduced damage to the flower/ foliage	3		
Processing of indigo cake	1. Mechanical aeration helps in production of quality cake	2		
Extraction and making Colour concentrates & Establishment of pilot plants	1 Complete extraction of pigment to make it cost effective & pollution free	4		
Dyeing yarn or fabric	1. Excess use of alum also pose problems to the soil		2	Proper ETP will be installed to trap alum before disposal
Training to motivate farmers in cultivation of indigo, marigold	1. Alternative crop management systems to provide sustainable income to the farmer	2		
Training self help groups in selection and collection of natural sources and their post harvest practices	Impart proper training addressing the post harvest practices	3		

Annexure II: Social safeguard: Activities, issues, impact and mitigation measures

Interventions	Anticipated level of Impacts	Issues		Mitigation measures (Negative Impact)
		Positive	Negative	
Motivation for cultivation of indigo and marigold	1. Provides sustainable income to the farmer 2. Non-marketable flowers may be used resulting in additional income to the farmers 3. Less adoption rate among the farmers	3 2	2	Impress on govt for providing subsidy for cultivation of dye bearing plants
Harvesting & proper post harvest practices	1. Income generation 2. Employment generation	3 3		
Processing of indigo cake	1. Higher price for quality indigo	4		
Collection and drying of other dye sources	1. Income generation to the farm families 2. Optimum utilization of natural resources	3 2		
Develop ergonomic & Ecological models for extraction of natural dyes	1. Validated model ready for duplication 2. IPR generation 3. Useful for upscaling	3 2 3		
Dyeing yarn or fabric	1 Labour intensive job		3	Combat the problem by providing ergonomic tools and equipment
Making enduse products & packing	1. Provides employment 2. Income generation	3 3		
Electronic cataloguing of shades developed in textiles, eco-powders and eco-paints	Ready tutorial for beginners in this field	2		
Establishments of training-cum-production centres	1. Provides employment 2. Provides additional income to rural people	3 3		
Economic feasibility and assessment of	1. Awareness to the consumer	2		

consumer acceptance and pricing strategies for natural dye enduse products.	2. Availability of products within the purchasing capacity of consumers	3		
Develop quality parameters for natural dye and its products	1. Avoids counterfeit Natural dye products	2		
Promote private brands for natural dye products	1. Quality brands increase exports	3		