

Value Chain on Commercialization of Maize Products

Environmental and Social Safeguards Management

A. Basic information :

1. Project data

Component code : 2
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Consortium partners

- 1 National Institute of Nutrition, Hyderabad
- 2 National Institute of Animal Nutrition & Physiology, Bangalore
- 3 Karnataka State Agro Corn Products Ltd., Bangalore
- 4 Karnataka Milk Federation, Bangalore
- 5 Project Directorate on Poultry, Hyderabad
- 6 Association of Women Entrepreneurs of Karnataka, Bangalore

2. Date of start : January, 2009

3. Planned duration : Three years and seven months

4. Project cost : Rs.451.22 Lakhs

5. Project objectives :

1. Fine-tuning of the existing agricultural practices for sustainable increased productivity and dissemination among the farmers.
2. To formulate innovative balanced nutritive foods from maize, studying their shelf life and fine tuning technologies for Commercialisation.
3. To evaluate the nutritionally cooked recipes from maize and to determine the beneficial effects for chronic disorders

4. Evaluation of maize grain byproducts for balanced feeds and popularization for enhanced livestock productivity.
5. Strengthening entrepreneurship skills of SHGs and NGOs for capacity building in up scaling of production for commercialisation and marketing of value added products.

6. Brief project description:

There has been an increasing trend with respect to area under cultivation over the last five years and still there is a scope to nearly double the yield by exploiting the genetic and other production potentialities and their dissemination requires research and extension service. Nearly three fourth of the total market produce is being processed as animal feed and rest for human consumption and industrial use. The project aims to divert much of the grain towards human consumption through development of maize based value added health foods for nutritional supplementation. The health benefits that accrue from these foods have not been fully exploited in India. The farmers have to be assured their due share of profits during production and marketing by involving them as a stake holder.

These innovative practices will be disseminated to the Maize Growers Association (MGA) by establishing backward and forward linkages with the help of State line departments. In the beginning, the project will be implemented in Mandya district on pilot basis in 500 ha area for raw material production through contract farming approach.. A preliminary market survey has revealed a huge demand for maize and maize products as health foods in urban and semi-urban areas, indicating a vast scope for fortification or nutritional supplementation at all the stages right from farmer's field to consumer's plate. The rich nutri maize is available in abundance to the consumers at relatively cheaper price (compared to other cereals) can be further commercially exploited for nutritive health foods by value addition and making available them at affordable price for the advantage of vulnerable groups and other consumers at large. The lead institute, UAS (B), will act as a research centre for both production of best quality raw material from the farmers field by conducting short term research and come out with innovations and also conducting research on value addition on maize health foods with the help of Food Science and Nutrition Department. In this process the NIN, Hyderabad will evaluate the products for commercialization. The Karnataka State Agro Corn Products Ltd, (KSACPL) will procure grains from MGF as per its specifications for large scale production of value added corn flakes and corn curls (Kurkure)and also supplies byproducts for NIANP Bangalore and PDP, Hyderabad for developing value added animal feeds

by evaluation. The NIANP, Bangalore and PDP, Hyderabad would conduct evaluation studies and to come out with innovative cattle and poultry feeds. The AWAKE (NGO) and Women and Child Development Department, Bangalore will assist women SHGs for credit access from banks.

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Common Facility Centre (CFC) for the entrepreneurial skills development of value addition by capacity building, for production and marketing of selected health foods (Maize Vermicelli, Noodles etc) through primary processing units furnished in the CFC.

Though there is an established maize value chain for animal feeds, the nutritional composition of these feeds need to be balanced by increasing the maize proportion in it as it is a cheap source of rich nutrition (maize has high energy, low fibers, and easily digestible by poultry, the lysine, Tryptophan, additional amino acids and low fat-4% is a made for each other for enhanced poultry-eggs& meat and dairy-milk productivity). The farmers are incurring nearly 60% of the total cost for feeds alone in dairy, they are looking for a quality nutritive feeds at relatively lower costs. To attain this objective NIANP, Bangalore will conduct research and come out with innovative standard products at relatively cheaper cost. Such products will be linked to cattle feed industry, the KMF, Bangalore for testing at field level through its Primary Milk Cooperative Societies (PMCS) for its acceptability and later scale-up production by conducting demonstrations. This would not only reduce the cost of feeds but also ensure quality milk production.

7. Environmental category issues in the sub-project

- **Social**
- **Environmental**

Since the project is eco-friendly, not much Social and Environmental issues will emerge and if there are any such issues have been be suitably addressed in the project.

8. 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

- The farmers may not undertake the sowing on the same day in the project area because of varied farming situations (Rainfall, soil type, topography etc.) thus there might be slight reduction in the targeted yield and pose problems in procurement, transportation and processing.
- The adoption of recommended improved practices *toto* is a complex issue on account of economic and other social constraints.
- Sudden outbreak of pest and disease in spite of surveillance may cause minimal economic yield loss.
- There may be slight quality reduction because of post harvest handling and primary processing (aflatoxin) even though intensive post harvest care measures are undertaken.
- The food products developed may have slight side effects; such effects will be nullified through nutritional analysis for safe health foods.
- The innovative animal feed composition developed by one consortium Partner may not be undertaken in large scale production by the other CPs in the beginning for want of market survey findings available to them, institutional policy etc.
- The members of the MGA may demand more price when purchased for project use because of traders competitive price.
- Few health products prepared by SHGs which may not have market demand, unless a target oriented market niche and other areas are identified.

9. Impact Assessment

Considering the base line data the impact generated in terms of employment generation, profit earning and nutritional security, assessment studies will be undertaken concurrently at each stage of the maize value chain of PCS.

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)

- The sustained crop increased productivity level will be continued in the project area as long as the growers adopt the improved practices.
- The farmers would continue to get better market price as they exposed to market intelligence and linking raw materials to the processing industries
- The other non-SHG members will also get self-employment opportunities by selling value added Products of maize, because of diffusion effect by the successful SHG entrepreneurs.
- Increased utility of maize for health foods, the nutritional status of the consumers will be increased especially people with obese and other chronic disorders with the consumption of value added health foods.
- The milk yield capacity of milching animals would increase with the feeding of balanced nutri composition feeds, similarly, the poultry egg and meat.
- The nutritional status of rural weaker sections will be enhanced when the nutritive health foods are made available to them at cheaper rate.

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

Public Institutes	1	National Institute of Nutrition, Hyderabad
	2	National Institute of Animal Nutrition and Physiology, Adugodi, Bangalore
	3	Karnataka State Agro Corn Products Ltd., PB No. 2479, Bellary Road, Hebbal, Bangalore
	4	Karnataka Milk Federation, Bangalore
	5	Project Directorate on Poultry, Hyderabad
NGO	6	Association of Women Entrepreneurs of Karnataka, Industrial Estate, Rajajinagar, Bangalore
Associate Partners		
	7	Karnataka State Department of Agriculture, Sheshadri Road, Bangalore
	8	Department of Women and Child Development, Bangalore
	9	Mysore Sales International Limited, Bangalore

12. Chronology of meeting/activities held in connection with preparation of the concept note and full proposal.

Sl. No.	Date & Location	Programme	Participants	Remarks
1.	10-09-2007 ZARS, VC Farm, Mandya	A preliminary meeting was held to prepare the concept note	ADR and interdisciplinary Scientists	Plan of work was decided to write the concept note
2.	18-09-2007 ZARS, VC Farm, Mandya	Working out modalities of concept note	ADR and interdisciplinary Scientists	Project team was formed
3.	27-09-2007 UAS, GKVK, Bangalore	Seeking permission from the University to prepare the NAIP project proposal	ADR	University accorded permission
4.	08-10-2007 ZARS, VC Farm, Mandya	Compiling relevant information as per the concept note proforma	Consortium leader and Associate Scientists	A draft copy concept note was prepared
5.	12-10-2007 UAS, GKVK, Bangalore	Finalization of concept note for submission	CPI and Associate Scientists	Concept note was submitted
6.	28-11-2007 NAARM, Hyderabad	Pre-stakeholders workshop	DR & CPI	Participated in the workshop to prepare draft full proposal
7.	18-12-2007 UAS, GKVK, Bangalore	Meeting with probable consortium partners	CPI and Officer in-charge of private Institutions of Food World, Fab Mall, Big Bazaar, Vet Care, KSSC & Monsanto	Extended invitation as Consortium partners and explained about the maize value chain and their complimentary role.
8.	19-12-2007 UAS, GKVK, Bangalore	Meeting with potential probable consortium partners	KSACPL, KSDA, Women and Child Development Department, Animal Husbandry	Extended invitation to be a consortium partners in the project. Explained about the maize value chain and their complimentary role.
9.	20-12-2007 UAS, GKVK, Bangalore	Meeting with probable consortium partners	MTR, KMF, NIANP, AWAKE, Venkateshwara Hatcheries	Extended invitation to be a consortium partners in the project. Explained about the maize value chain and their complimentary role of support.
10.	24-12-2007	Reminding and confirmation of	CPI and Associate	Sought their confirmation of participation for the ensuing

	UAS, GKVK, Bangalore	participation over phone	Scientists	26th stakeholder workshop
11.	26-12-2007 UAS, GKVK, Bangalore	Stakeholder workshop (as per the suggestion of NAIP)	Hon'ble VC, UAS, Bangalore, DR, CPI and 20 officers in-charge of different institutions and organizations	Workshop was conducted as per the suggestion of ND-NAIP.
12.	27-12-2007 UAS, GKVK, Bangalore	Preparation and submission of workshop proceedings	CPI and Associate Scientists	The proceedings of the workshop mailed to National Coordinator, and NAARM, Help Desk, Hyderabad
13.	25-12-2007 NASA Complex, New Delhi	Proactive NAIP workshop with Director General, ICAR and PMC Chairman	DG (ICAR), Secretary to CARE, CPI, ND (NAIP) and National Coordinator (NAIP) and other TAG Members	Participated in the workshop and noted the suggestions and made for reoriented the project title and objectives etc.
14.	07-01-2008 ZARS, VC Farm, Mandya	Compliance report to the information required by the National Coordinator	CPI and Associate Scientists	The compliance report was mailed to the National Coordinator and NAARM, Help Desk as desired by them.
15.	08-01-2008 ZARS, VC Farm, Mandya	Pre-review discussion to prepare draft full proposal under the Chairmanship of the DR	DR, CSO, CPI and Associate Scientists	The suggestions made were incorporated as per the proactive workshop, New Delhi proceedings
16.	10-01-2008 UAS, GKVK, Bangalore	Discussion with Hon'ble Vice-Chancellor about the full paper (presentation)	VC, DR, CSO, CPI and Associate Scientists	Suggestions from the discussion were incorporated in the full proposal
17.	11-01-2008 to 14-01-2008 UAS, GKVK, Bangalore	Preparation of full paper draft report in consultation with selected consortia partners	CPI and Associate Scientists	Prepared draft full paper in team work.
18.	22-01-2008	Presentation of project proposal before TAG-2 in New Delhi	CPI and Associate Scientists	Presented the full proposal
19.	31-01-2008	Meeting with selected	CPI and Associate	Discussed about suggestions provided by TAG-2

		consortium partners	Scientists	& incorporated in full paper
20.	04-02-2008	Visit to NIN, Hyderabad	CPI and Associate Scientists	Discussed the technical programme and budget requirement
21.	7-8 April 08	TAG-2 Meeting at ICAR, New Delhi	CPI and Associate Scientists	Presented the full proposal before the committee and incorporated.
22.	28-30 April 08	NAIP, RPC workshop at NAARM, Hyderabad	CPI & Associate Scientists	Workshop regarding finalization of project proposal. The value chain models were prepared and relevant ones was incorporated in the full proposal.
23.	18-08-2008	16 th RPC meeting at New Delhi	CPI & Associate Scientists	Presented the full length project proposal
24.	29-08-2008	ZARS, V.C. Farm, Mandya, Karnataka	Lead Institute and Core consortium Partners	Revised the full Proposal as per the 16 th RPC Meeting
25.	30-9-2008	UAS, GKVK, Bangalore	Consortium Leader, Director of Research, CPI and Co-PI	Apprised the project report and discussed about the budget proposed, before attending cost committee meeting on 1-10-08, at New Delhi.
26.	1-10-2008	Cost committee meeting	Lead institute and core partners	Presented the budget details and suggestions were incorporated in the full proposal.
27.	30-10-2008	PMC meeting	Lead institute	Suggested to include the PDP, Hyderabad as a Consortium partner and provisional sanction was given to the project.

13. Measure to address the issues

Best technologies will be transferred to the farmers in away that farmers will produce the quality grains in the field with increased productivity, such grains will serve as the best raw material for the processing industries to produce the innovative, commercial balanced nutritive foods to human beings and animals. During the process of production, the climate aberrations, arrangement of critical inputs, crop management and post harvest management etc, have been adequately addressed through mitigation measures. Similarly, measures for marketing of raw

materials and processed foods capacity building of farmers SHG women and other stake holders have been addressed, if required contingency plan will be prepared in way that the PCS chain will sustain.

14. Consultancy / disclosures to be done in future:

The information generated from the project shall be shared in different forums like workshops, seminars, symposia etc., for the benefit of scientists, students and other public who ever interested in. Impact of the project (employment, nutritional security etc.) shall be documented. The assessment findings and feed-back, suggestions etc., are duly made available to avoid recurring mistakes, if the similar project is implemented else where in the country. The publications generated from the project will be widely circulated to the agencies when requested. Development of web page and loading of information for general public for its utility shall be undertaken. The findings of the project will be presented in the national and international forums with permission from the NAIP for its utility at various levels.

Dissemination of generated information through trainings, demonstrations, literature, mass media (TV, Radio, News papers, websites etc.) will be undertaken to take advantage of project findings for replication of Maize Value chain in other potential areas.

A database will be made available for the different institutions to get access and to make use of the findings. A comprehensive guideline will be developed in such way that the local institutions in the project area would utilize the resources generated, for sustenance of project results.

Consortium PI

National Coordinator

National Director

Annexure I

Environmental safeguard: Activities, issues, impact and mitigation measures

Activities ¹	Issues ²	Anticipated level of Impacts ³		Mitigation measures (Negative Impact) ⁴
		Positive	Negative	
Procurement and storage of grains	Enhanced shelf life and reduced losses in storage grain mold – aflatoxin		1	Post harvest management technologies (drying grading other storage technologies)
Supply of grains to the processor	Best quality grains ensured to the processor	5		
Processing technologies				
Value addition	Nutritive food/feeds preparation	4		
Packaging	Biodegradation of packing material		1	Use of the best quality and environment friendly packing material
Food products prepared from Hybrids/QPM for school children and rural women	Wide variety of nutritive foods ready to eat type	4		
Utilization of value added foods for the management of a few chronic disorders.	Neutraceutical foods	4		
Application of improved practices (Pesticides and fertilizers)	Grain pesticide residues and soil fertility		1	IPM and INM measures to prevent the pest (stem borer and other pests and soil fertility maintenance

Annexure II

Social safeguard: Activities, issues, impact and mitigation measures

Activities ¹	Issues ²	Anticipated level of Impacts ³		Mitigation measures (Negative Impact) ⁴
		Positive	Negative	
Production of raw materials in the farmers field	Formation of Growers Association, Competition for membership	4		
	Supply of critical inputs to the maize growers association members, problems from non members in distribution	3		
	If there is delay in sowing of seeds by the growers	3		
	Outbreak of pest and diseases	3		
Processing	The procurement agencies might procure less than the quantity indented from the growers.		1	Alternate procurement arrangement from other agencies
	Processing of innovative animal feeds	3		
Marketing	The growers demand more price to their produce		1	Procurement linkages plan will be developed for better market price
	Consumption of health foods-side affects	4		
Evolving improved practices and production of raw materials by the growers	Failure of rains		1	<ul style="list-style-type: none"> • Contingent drought plan • Selection of farmers with protective irrigation
Post harvest	Rains during harvesting period (aflatoxin)		1	<ul style="list-style-type: none"> • Weather forecasting • Post harvest care& management (scientific drying, heaping, storage etc)
Pest and disease management	Pest& disease outbreak		1	<ul style="list-style-type: none"> • Surveillance & IDM package

