

A MILK VALUE CHAIN FOR THE UNORGANISED SECTOR

Environmental and Social Safeguards Management

A. Basic Information

1. Project statistics:

Component code : 2

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Associate Professor,
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Institution : **Tamil Nadu Veterinary and Animal Sciences University**

Name of CoPI : **Dr.V.Padmanabha Reddy**
Institution : Professor DTP, College of Veterinary Science,
Tirupati

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Institution : **Dr. G. B. Reddy**
Institution : Joint Director Indian Institute of Packaging,
Chennai

Name of CoPI : **Rev.Fr.Arul Devadoss**
Institution : Executive Director Madras Social Service Society,
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Consortium partners : 1.DTP, College of Veterinary Science, Tirupati
2.Indian Institute of Packaging, Chennai
3.Madras Social Service Society, Chennai
4.M/S.Winner Dairy, Pondicherry

2. **Date of Start** : 28 April 2009

3. **Planned duration** : 3.5 years

4. **Project cost** : Rs. 3.41 Crores

5. **Project objectives:**

1. **Production:** To enhance the milk production in the un-organized sector by nutritional supplementation with minerals, to enhance hygiene by machine milking and to improve the keeping quality by use of Vapour Absorption Refrigeration System based bulk milk chillers working on gas.
2. **Processing:** To develop dairy based convenience synbiotic health foods by potential application of probiotics, prebiotics and phytogetic compounds, to optimize the processing parameters with redesigned equipments and to evaluate their health claims
3. **Packaging:** To study the prospects of utilizing coconut shell and areca nut leaf container as eco-friendly packaging materials to improve shelf life of bulk foods.
4. **Marketing:** Development of integrated quality management systems for emerging markets and establishment of linkages for commercialization.

6. **Brief project description:**

The NAIP is to facilitate accelerated and sustainable transformation of Indian agriculture in support of poverty alleviation and income generation by collaborative development and application of agricultural innovation by the public research organizations in partnership with the farmer's groups, the private sector, the civil society organizations and other stakeholders The emphasis on component 2 of NAIP ie research on PCSs is a simple reflection of the fact that agricultural growth in India is increasingly market driven and that the challenge to raise income and welfare to the agricultural community has to be met in a market context. The PCS implies a higher priority to among others, post-harvest processing, quality management and safety issues. The importance of

the market also implies a shift in attention to products with large market and income growth potential.

The milk value chain is highly distorted. The proposed dairy value chain starts with the raw milk, its supply at the farm level, processing, product development, packaging and ends with consumers who make the choice to buy, or not to buy, the finished product. Consumers are the primary source of the economic value of the chain and its links. Consumers determine when and how they want dairy products. The participants in the dairy value chain must act to meet consumer demands. Quality is paramount and keeping up with changing markets can be a challenge. Watching consumer trends, adopting new technology, and building strong value chain relationships can facilitate meeting that challenge. A “systems” strategy coordinates participants' efforts throughout the value chain .

In the unorganized sector the milk production is very low and the keeping quality of the milk is also very low owing to initial high bacterial load and ambient temperature which favours the growth of micro organisms in a tropical country like India. Hence interventions will be made to increase the productivity of cow to some extent by supplementing mineral mixture and advocating hygienic milk production practices and practicing machine milking and bulk cooling at farm level by using milk chillers using alternative energy source.

Therefore, the present approach is to link up the value-chain through appropriate interventions in production, procurement, processing, and product and market development, tagging or branding as health food and to ensure the availability to common man at home and in public catering institutions. This will also help in increasing the competitiveness of dairy farmers in terms of milk productivity and hygienic quality.

A value-chain involving convenience functional milk foods and herbal dairy products aiming at enhancing health of consumers is expected to impact positively not only on income generation but also ensuring nutritional security of the consumers. It also increases the employment as it involves small and medium scale enterprises.

A Milk Value Chain for the unorganised sector will help to benefit the producers and to explore the un-organised sector by use of latest technologies from production to consumerism. Value addition to milk by preparing novel milk products like functional convenience milk foods using probiotics and herbal ingredients will help in satisfying the health conscious consumers markets both at national and

international levels The emerging need of food safety protocols, mandatory declaration of health benefits of the proposed milk products will be addressed in the proposed project

Thus employment for food technologists and qualified personnel due to expansion of the processing dairy industry. The growth of allied sector viz., equipment manufacturing units, packaging industries, supplier of value adding components like prebiotic, probiotics and herbal ingredients and sustainable development of dairy sector is envisaged.

Value addition to milk by preparing novel milk products like functional convenience milk foods using probiotics and herbal ingredients will help in satisfying the health conscious consumers markets both at national and international levels.

This project proposal on Milk Value Chain will help to explore the un-organised sector by use of latest technologies from production to consumerism. The stake holders of small and medium milk producers or SHG can get benefited by the proposed interventions in the milk value chain and ultimately the potentials of entrepreneurs are identified for a making the dairy sector to witness sustained growth .

The project proposal will create employment for food technologists and qualified personnel due to expansion of the processing dairy industry. The growth of allied sector viz., equipment manufacturing units, packaging industries, supplier of value adding components like prebiotic, probiotics and herbal ingredients is envisaged.

The emerging need of food safety protocols, mandatory declaration of health benefits of the proposed milk products will be addressed in the proposed project. This will not only lead to a sustainable development of dairy sector but also will uplift the socio economic status of the rural milk producers of the un-organised sector of our nation.

7. Environmental category issues in the subproject :

- **SOCIAL:**

The milk value chain is a project aimed at un organized sector with low milk production and poor returns. There will not be any environmental issues due to feed supplementation or hygienic milking practices. Machine milking is still a political issue in terms of animal welfare aspects at certain pockets and there are no foreseen issues in the

selected districts. The local administration can be convinced at the time of implementation substantiating with the foreseen higher income and improvement in their standard of living.

- **ENVIRONMENTAL**

At a larger scale of production and processing, the disposal of effluent may pose threat which can be ameliorated by construction of effluent treatment plants. The project will have mostly positive impact on environment as it focuses on augmenting Milk production by Supplementing mineral mixtures. Adoption of hygienic milking practices like developing Low cost Machine Milking, Developing bulk coolers with alternative energy and Good milking practices. The milk thus produces will be used for development of low cost health promoting convenience milk products and powders, Bio milk beverages by using probiotics, phytogetic compounds having health benefits applying innovative processes. Simple equipments like f curd strainer, smart curd device will be used .Food safety management systems including GMPs, SOPs, CCPs will be worked out for each product and hence there will be no environmental issues uncared to. The use of eco friendly packaging materials for increased Shelf life will help to preserve the eco system. This project will ultimately develop entrepreneurs through promotion of innovative products.

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)	[]	[X]
Pest Management (OP 4.09)	[]	[X]
Cultural Property (draft OP 4.11-OPN 11.03 -)	[]	[X]
Involuntary Resettlement (OP/BP 4.12)	[]	[X]
Indigenous Peoples (OD 4.20)	[]	[X]
Forests (OP/BP 4.36)	[]	[X]
Safety of Dams (OP/BP 4.37)	[]	[X]
Projects in Disputed Areas (OP/BP 7.60)	[]	[X]
Projects on International Waterways (OP/BP 7.50)	[]	[X]

B. Risk analysis and related issues

- Adoption of VARS for bulk chilling of milk using alternative source of energy with out electricity, their availability round the clock, declaring of GRAS (Generally Regarded As Safe) status to probiotics, non toxicity of phytogetic compounds and to adequately and clinically conduct in vivo studies, actual bio degradability of materials used and pragmatic reliability on strength and perishability of packaging materials to be tried with package of practices in a holistic way may be a problem if funds are inadequate.
- Marketing of value added milk products and feasibility with purchasing power , unless the prices are lower than market prices.

9. Impact assessment

The project mostly will have positive impact as it involves improving the quality of milk by natural resource utilisation and management ie enhancing the animal productivity through feeding systems. Wherever negative impact is perceived through individual interventions, appropriate mitigation measures have been planned which are detailed in Enclosures I and II.

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 health status of the health conscious consumer segment is improved through consumption of functional probiotic and phytogetic foods.
- Health benefits to control pathogenic intestinal microbiota, hypocholesterolemic effect, cardiac care and ani hypertensive effect are some of the therapeutic values among consumers.
- Direct impact like availability of functional foods with Indian consumers a the same time providing quality milk to the processors or industry as well as better income to the milk producers of un organised sector.
- The indirect benefits will be sustainability of milk production in the unorganised sector of the country, quality assured milk and efficiency of dairy production.
- Increased milk production with quality will help to find better avenues in the international market as well as with the Indian Dairy Industry.
- Development non conventional bulk coolers, curd incubators and curd strainer will open opportunities for availability of quality milk, traditional foods like Indian curd and shrikhand at nook and corner of the society.
- Awareness of milk producers for achieving better returns with improved marketing approaches.
- Rural entrepreneurship will help in reducing migration to urban areas through enhanced employment and income generation.

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:

DTP, College of Veterinary Science, Tirupati
Indian Institute of Packaging, Chennai

Private participation:

M/S.Winner Dairy, Pondicherry
Associating Partner : Melmaruvathoor Athiparasakthi Institute Of Medical Sciences And Research, Melmaruvathoor, Kancheepuram

1. Assessing the therapeutic properties by clinical trials, isolation of probiotic LAB from healthy adults, characterisation. Dr N.Dinakaran and Dr Devaki

Linkage Institute-

NDRI, BANGALORE

Technical suggestions and expertise will be obtained from National Dairy Research Institute, Bangalore in executing various interventions

NGOs:

1. MSSS; Madras Social Service Society,

International institutes:

Michigan State University, USA
Virginia Tech
University of Nebraska USA

Preliminary discussions were held with few stakeholders and NGOs. They were made aware of NAIP project, objectives and expected outputs and impact. The final modalities will be worked out after the project approval.

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

S. No	Date & Location	Programme	Participants	Remarks
1	27 August, 2008 TANUVAS, MADAVARA M	Brainstorming session on NAIP consortium by CL	Director of Research, TANUVAS. Staff of Department of Dairy Science, Gastroenterologist from MAIMSR Melmaruvathoor, SVVU staff, Ngo Hyderabad	to evolve broad contours of milk value chain
2	OCT, 2009	Power point	To assess the practical	

S. No	Date & Location	Programme	Participants	Remarks
		presentation of Milk Value Chain to Director of Research, representatives from IIP, WINNER DAIRY, MAIMSR, MSSS	feasibility and modifications accordingly	

13. Measures to Address the Issues:

Environmental safeguards viz Activities, Issues, Impact and Mitigation Measures have been detailed as Enclosures. The producers will be imparted with necessary skills through extension and training by the consortium partners. The awareness on Environmental and Social Safeguards Management will be addressed to the stakeholders through orientation session. The methods of feeding, disposal of manure hygienic milk collection, handling and processing of milk products will be taught to the involved personnel. To mitigate pollution, standard operating procedures and GMP will be adhered to. Care will be taken in the design of equipments for maximum safety and to follow the norms of HACCP.

To improve the keeping quality and shelf-life of products, improved packaging methods will be evolved. The symbiotic foods will be evaluated for effectiveness of probiotics and prebiotics. To check the BOD and COD levels Effluent will be treated.

14. Consultation/ disclosures to be done in future:

Local disclosure through mechanisms such as launch workshop, interfaces during the implementation stage of the subproject for sharing the results and soliciting feed-back, one will circulate project brochures and implementation progress from time to time, putting up annual reports on the web site and annual stakeholder workshops wherever feasible.

The consultation/ disclosures will be done as per NAIP guidelines depending on the progress of the project. Participating farmers will be trained through demonstration programmes and workshops on various themes relevant to farming including use of IPM & IPNS, primary processing, post-harvest product preparations, packing, labelling, nutritional benefits awareness, recipe making, marketing aspects *etc.*

The project findings (brochures/ CDs/ videos/ literatures) will be disclosed from time to time and necessary feedback will be collected for further improvement and better implementation. Assistance of different related organizations will be taken.

1. Replication of clusters

2. Demonstration of new products preparations to stakeholders
3. Transfer of technology of value-added health foods to stakeholders
4. Dissemination of information and sensitization of line departments of state and central governments to policy makers, planners and project partners for enhancement of millets consumption
5. Popularisation through information dissemination on safety of developed products to the consumers.
6. Information dissemination through mass and print media on health and nutritional benefits to stakeholders, targeted groups especially diabetic and obese urban consumers.
7. Linkages with financial institutions will be enabled so that as when requested the entrepreneurs are adequately financed for their commercial activities. Both print and other media will be fully utilized to attain the desired goals and objectives.

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	
Implementation of HACCP.	Safety certification is in place	✓(4)		
Assessment of nutrient requirement of milk in selected area	Market for mineral supplements and green fodder due to increased consumer awareness on nutritional composition of milk	✓(4)		
Assess socio-economic and environmental impacts of the interventions for uptake plan.	Environmental impacts information will be available for further use	✓(5)		

Anexure II

Social Safeguards : Activities, Issues, Impact and Mitigation Measures

Activities ¹	Issues ²	Anticipated level of impacts ³		Mitigation measures (negative impact) ⁴
		Positive	Negative	
Entrepreneurship	Involvement of more producers and participation of farmers	✓(4)		
Veterinary and animal husbandry activity	Increased activity due to profitable business and job opportunities	✓(4)		
Health improvement in the society due to functional convenience foods	Improved consumption of nutritive and functional foods	✓(4)		
Sensitizing line departments of governments for enhancing millet consumption	Nutritional security can be achieved	✓(2)		
Standardize combinations of probiotics, prebiotics and phytogetic compounds for making synbiotic functional dairy foods	Nutrition through value addition of milk	✓(4)		
Integrated farm extension services	Effective milk production and processing practices in an organized sector	✓(4)		
Development of convenient and ready to eat milk foods	Makes a it a highly palatable and relished food	✓(4)		