

VALUE CHAIN ON NOVELTY PORK PRODUCTS UNDER ORGANIZED PIG FARMING SYSTEM

Environmental and Social Safeguards Management

A. Basic Information

1. Project statistics:

Component code	:	2
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Consortium partners : 1. **National Research Centre on Pig, ICAR,
Rani, Guwahati**
2. **Central Institute of Post Harvest
Engineering & Technology, ICAR,
Ludhiana**

2. Date of Start : 12th September, 2008
3. Planned duration : Three years ten months
4. Project cost : Rs. **6.58 Crores**

5. Project objectives:

1. To promote innovative value chain concept in novelty pork products development under organized pig production system and optimization of the technological processes of value added pork products to suit to the local taste.
2. To develop low cost pig ration by incorporating locally available feed ingredients for better economic return.
3. To refine the design and protocol of selected meat processing equipment for import substitution.
4. Development of entrepreneurs in scientific rearing of pigs, production and marketing of wholesome pork and pork products.

6. Brief project description:

About 95% of the indigenous people of the North Eastern region of India are meat eaters. The preferential choice of the indigenous people towards meat, who are mostly of Mongolian origin, is perhaps due to the fact that the Mongolians are genetically deficient in blood iron and consumption of meat facilitates absorption of iron both from

organic and inorganic sources by at least three times. The loss due to the blood iron deficiency in the people of the NER to the National GDP has been estimated at over Rs. 1,500.00 crores annually (Ministry of Food Processing Industries, 2005). However, there is a severe shortfall in meat production in the region. For instance, Assam produces only 0.03MT of meat against the annual requirement of 0.29MT, leaving a deficit of 0.26MT. This signifies that there is an imperative need to grow more food animals in the region and pig may be considered as the animal of choice due to its high prolificacy, early attainment of slaughter/market weight, efficient feed conversion rate, relatively less susceptibility to diseases and preference of the local population to pork and pork products. In fact pig is considered as a revered animal and consumption of pork is the highest in the NER. However, the production and processing scenario of meat in the region is awfully underdeveloped. Shortcomings in the infrastructure, unhygienic transport and absence of an organized marketing network and unprofessional further processing of this highly perishable food item are specific areas which need to be urgently addressed as a public health priority. There is an urgent need for a serious endeavour to improve the situation. Of late, probably due to the effect of globalization of the market, large quantities of imported meat products have invaded the local markets; however, the common people do not have access to such meat delicacies due to high cost and also many of them do not relish the exotic taste of these products.

Fermented bamboo shoots have preservative, antioxidant and flavour enhancing properties and people of the entire South East Asian countries relish fermented bamboo shoots in a variety of forms and food preparations including meat. In the proposed project, it is envisaged to develop certain novelty pork products by incorporating fermented bamboo shoot. It is also envisaged to develop design and protocol of the state-of-the-art meat processing equipment for import substitution through reverse engineering. In order to develop entrepreneurs to take up scientific piggery farming and pork processing as a means of livelihood security and social well-being, some of the selected traditional pig farmers and processors would be trained on various aspects of modern pig husbandry, the art of wholesome pork production and value addition through processing to pork products for enhanced economic return. As the cost of ration accounts to more than 65% of the total cost of pig production, it is proposed to develop low cost pig ration by incorporating locally available feed ingredients for better

economic performance. To address to the requirements of production of wholesome pork and pork products by adhering to the prescribed food safety norms, the proposal has been developed in a production to consumption mode by incorporating the value chain concept in pig husbandry, wholesome pork production and development of novelty pork products suiting to the local taste, and scientific utilization of slaughterhouse by-products to define the model of a viable pig industry.

7. Environmental category issues in the subproject

- **Social**

No issues of social conflict are foreseen due to implementation of the project. In the NER, pig is considered as a revered animal by the tribal population and the technologies developed under the project are envisaged to be well accepted by the society.

- **Environmental**

Issues of environmental concern will not be created by the proposal (Annexure I)

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

- High risk of exposure to diseases of viral and bacterial origin to pigs under intensive system of management. However, the risk related to disease outbreak in the pig farm has been noted and a definite schedule of vaccination against some of the common diseases has been included in the action plan for health care management of the pig farm.

Vaccination Schedule:

Vaccine	Dose	Route	Lead time to develop Immunity	Repetition
Swine fever vaccine	1 ml	S/C	21 days	Annually
HS (Adjuvant)	2ml	S/C or I/M	20 days	Annually
FMD	1ml	S/C or I/M	15-20 days	Thrice in a year

- Fluctuation of market prices of feed ingredients and concomitant increase in the feed cost may be a recurrent problem and adequate financial support to meet up the additional expenses may be required.
- Depreciation of INR against major foreign currencies like US\$ and Euro may increase the capital cost of the project, which shall have to be adequately supported.
- Inherent reluctance of traditional pig farmers to switch over to modern pig farming and processing of pork and pork products.
- High capital investment in livestock farming like piggery and burgeoning cost of pork processing equipment may act adversely in motivating entrepreneurs to adopt piggery farming and processing of pork and pork products as a regular avocation.

- Absence of an organized pork production and marketing channels in the region and high perishability of pork product.
- Enhancement of cost of production due to interventions like preservation, packaging etc.

9. Impact assessment

1. The project is envisaged to serve as a role model in revolutionizing the age-old backyard pig farming system and encourage the farmers to adopt scientific methods for hygienic pig production.
2. The facilities developed under the project would help in demonstration and hands-on training in humane slaughtering of pig and processing of pork for value addition, slaughterhouse by-products utilization etc. for better economic return to the producers and processors alike.
3. The project would serve as a model unit for replication elsewhere for production of wholesome pork and pork products ensuring public health safety.
4. To project is envisaged to motivate farmers and entrepreneurs to take up intensive piggery farming and pork processing units.

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 sub-project envisages developing a role model of an integrated pig farming system coupled with facilities for wholesome pork production, processing of pork for value addition and scientific utilization of slaughterhouse and pig farm by products/ waste for better economic return. The consumers of pork and pork products will have access to quality and safe pork and pork products.
- The traditional pig farmers and small scale processors who are hitherto ignorant about the significance of wholesome production of pork and pork products would be benefited from the relevant technologies in production of wholesome pork and pork products which would have significant public health importance.
- Better economic return to the pig farmers and processors is envisaged due to adoption of the prescribed 'package of practices' developed through the project.
- Since no issues of social conflict are foreseen due to implementation of the project. In the NER, pig is considered as a revered animal by the tribal population, the technologies developed under the project are envisaged to be well accepted and beneficial to the farming masses for improving the quality of their lives.

- Successful implementation of the project and adoption of the technologies developed under the project by the development departments/ agencies will ensure availability of quality pork and pork products and thereby guaranteeing nutritional security to the vast non-vegetarian population of the region.

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:

The sub-project is an institutional one and hence there is no direct stakeholders engaged in the sub-project.

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

- The Concept Note was developed under the technical guidance of the Director of Research (Veterinary), Assam Agricultural University, Khanapara, Guwahati.
- The Dean, Faculty of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati provided the necessary scientific inputs.
- The consortium partners then drew up the Concept with technical inputs provided by the subject experts from the Department of Livestock Products Technology, Livestock Production and Management, Animal Nutrition etc., College of Veterinary Science, AAU, Khanapara, Guwahati.
- The project was vetted by the full panel of project Review Committee of the Faculty of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati.
- A series of 14 rounds of discussions were held to fine-tune all aspects of the Project.
- Dr. Jagannadhan Challa, Principal Scientist, Education Technology, National Academy of Agricultural Research Management, Hyderabad was consulted.
- The assistance of the NAIP Helpdesk at NAARM, Hyderabad was sought from time to time and special mention is made of Dr. Pradeep Raj for his help and support.
- The project proposal was presented in the meeting of the TAG-2 of the NAIP held at New Delhi on 7th February and 7th April, 2008. The National Director, NAIP also addressed the CPIs on 8th February, 2008 at KAB-II, ICAR and explained few points on further improvement of the proposal. Suggestions made by the learned members of the TAG-2 for modification of the proposal were incorporated in the subsequent revision of the proposal. The 15th meeting of the RPC was held on 16.6.2008 at PIU, NAIP, KAB-II, ICAR, New Delhi and the Committee's recommendations were incorporated in the

subsequent revision of the proposal. The meeting of the Cost Committee was held on 17.6.2008 at PIU, NAIP, KAB-II, ICAR, New Delhi and the observations of the Committee were noted for revision of the budget requirements of the project proposal.

- The 14th meeting of the Project Management Committee (PMC) held on 31.7.2008 under the Chairmanship of Dr. Mangalai Rai, Secretary, DARE and Director General, ICAR took up the proposal for consideration and the suggestions put forwarded by the Committee was incorporated in the final proposal.

13. Measures to Address the Issues:

- To set up a model pig farm so as to disseminate hands-on training programme on scientific rearing of pig.
- To transfer of technologies of artificial insemination for profitable pig farming.
- To transfer the design and protocol of selected meat processing equipment for domestic manufacturing.
- To train farmers on use of locally available feed ingredients in formulating low cost pig ration.
- To conduct hands-on training programmes on humane slaughter of pig, production of wholesome pork and value addition to pork products for better economic return.
- To conduct training programme on the importance of adopting 'good manufacturing practices' (GMP) in production of wholesome pork and pork products.
- To conduct training programmes on hygienic disposal of farm and slaughter house by-products/ waste materials to minimize environmental pollution.
- To help in project preparation to farmers and processors for obtaining support from financial institutions and in providing technical support in managing the pig farms and processing units.
- To motivate the farmers to form Shelf Help Groups (SHG) so as to become eligible for subsidized finance from the Nationalized Bank and other agencies.

14. Consultation/ disclosures to be done in future:

The various outcomes of the project will be communicated to the local people through various extension tools like workshops, farmer's interaction with the expert from various fields of specialization of the project, distribution of leaf-lets and brochures etc. Moreover, the annual progress of the project will be uploaded to the project website from time to time.

The consultation/ disclosures will be done as per NAIP guidelines depending on the progress of the project. Participating farmers will be trained through demonstration of various techniques and methods relevant to pig farming, primary processing, value addition to pork products, packaging, labeling, marketing aspects *etc.*

The project findings will be release from time to time in the form of brochures, CDs and literatures amongst the farmers/entrepreneurs and the feedbacks gained from these communications will be compiled and adopted for future up gradation of the endeavour.

- Propagation of knowledge on scientific pig husbandry and pork processing amongst the target farming community by acting as a key player.
- Transfer of technologies for production low cost compound pig ration incorporating locally available feed ingredients.
- Dissemination of technical know-how on humane slaughter of pig, preparation of different value added pork products through hands-on training.
- Transfer of technical know-how on utilization of slaughterhouse by-products as pet food.
- Transfer of technologies for environment friendly aerobic disposal of pig sty and slaughterhouse waste products.
- Transfer of technologies of artificial insemination for profitable pig farming.
- Transfer of design and protocol of selected meat processing equipment for domestic manufacturing.
- To draw attention of the planners and executors of the State as well as Central agencies about the constraints in profitable pig husbandry and suitable remedial measures thereto.
- To act as a catalyst between financial institutions and farmers/entrepreneurs to rationalize the process of providing finance to help them in adopting the avocation of pig farming and processing as a means of livelihood security.



Consortium PI

National Coordinator

National Director

Annexure I

Environmental safeguard: Activities, issues, impact and mitigation measures

Activities	Issues	Anticipated level of Impacts		Mitigation measures (Negative Impact)
		Positive	Negative	
Scientific care and managerial practices in organized pig farm	Maintenance of healthy herd	3		
	Attainment of early market weight	4		
	Prevention of pre-weaning piglet mortality	3		
	Hygienic farm management practices	4		
Artificial insemination technique	Minimization of breeding cost	3		
	High reproductive and productive performance of the herd	4		
	Higher conception rate	3		
	Higher litter size at birth	3		
	Prevention of repeat breeding	3		
	Prevention of Sexually Transmissible Diseases (STD)	3		
Health care measurements in pigs	Adoption of McLean County System for control of parasitic diseases and deworming of animals	3		
	Regular vaccination of animals	4		
	Scientific health care	4		
Establishment of an abattoir and meat processing plant	Adoption of humane method of slaughter of pig	4		
Regular monitoring of microbiological, physico-chemical and eating quality traits of pork and pork products for safety and quality assurance.	Safeguard to public health of pork consumers	3		
	Identification of the CCPs to develop a model of HACCP in production of clean pork and pork products	3		
*Construction of ponds	Aerobic disposal of pig farm and slaughterhouse waste.	4		
*Vermiculture	To produce composite manure by utilizing pig excreta.	4		
Study on the textural,	Assurance of quality pork	4		

physico-chemical, sensory, safety and keeping quality characteristics of slaughterhouse by-products incorporated meat loaf	and pork products			
	Utilization of slaughterhouse byproducts for better economic return	4		
Study on the productive and reproductive performance of pigs fed with pig ration incorporated with locally available feed ingredients.	Better growth performance, higher litter size and better economy to the farm	4		
Refinement of design of design and development of selected meat processing equipment				
Refinement of design and development of electric stunner	Painless slaughter of pigs	4		
Refinement of design and development sausage stuffer	Clean comminuted pork products preparation	3		
Refinement of design and development bowl chopper	Clean minced meat production	3		
Refinement of design and development meat transport vehicle	Prevention of post slaughter contamination of pork during transportation	4		

Annexure II

Social safeguard: Activities, issues, impact and mitigation measures

Activities	Issues	Anticipated level of Impacts		Mitigation measures (Negative Impact)
		Positive	Negative	
On farm training on different aspects of pig husbandry	Motivation of farmers to adopt scientific piggery farming	2	1	Weak financial status of traditional pig farmers
	Adoption of humane slaughter of pigs	3	2	All processors may not be able to afford the cost of an electric stunner
	Encouragement to form Shelf Help Groups (SHGs) on piggery farming and pork production and processing	2		
	Improvement of rural economy and quality of life of pig farmers	3		
Value addition of pork and pork products	To develop nutrient dense meat products	3		
	To create awareness about various positive effects of value added products	3	1	Poor economic and educational status of majority of traditional pig farmers
	To supply quality pork and pork products to the consumers	3		
Documentation on the nutritional profile of locally available feed ingredients	To formulate economic pig ration for higher economic return	3		
	Transfer of technologies for production of compound pig ration by utilizing locally available feed ingredients	3	1	Inherent reluctance to adopt newer technologies by traditional farmers
Establishment of an abattoir and meat processing plant	Supply of wholesome pork to consumers	3		
	Demonstration on the art of humane slaughter and	3	2	All processors may not be able

	clean dressing procedures			to afford the cost of a modern slaughterhouse
	Protection of consumers from meat borne zoonotic diseases	3		
Transfer of technology to entrepreneurs	To provide hands-on training to motivate farmers/entrepreneurs to: <ul style="list-style-type: none"> • take up piggery farming as a means of livelihood security 	3	1	Inherent reluctance to adopt newer technologies by traditional farmers
	<ul style="list-style-type: none"> • To establish small scale slaughterhouse and meat processing units for hygienic production and processing of pork 	3	1	-do-
	<ul style="list-style-type: none"> • Transferring of package of practices for better farm performance 	3	1	-do-
Execution of HACCP Principle	Public health assurance of pork consumers	3		
Sensitization of the concerned departments of Government	To consider piggery development issues while formulating different policies	3	1	Insufficient data on local situations and formulation of policies at the National level
	To encourage the farmers by providing easy access to financial aids.	3	2	Poor credit facilities offered by the banking sectors
	Nutritional security of the people	3		
Refinement of the design and development of selected meat processing equipment	Encouragement of local manufacturers to develop low cost meat processing equipment	3	1	Initial requirement of high capital investment
	Improvement in the meat processing scenario of the Indian meat trade	3	1	Resistance by the traditional meat traders
Impact assessment	To serve as a model unit for replication elsewhere for production of	3		

	wholesome pork and pork products ensuring public health safety.			
	Motivation of farmers and entrepreneurs to take up intensive piggery farming and pork processing units	3	1	Inherent reluctance to adopt newer technologies by traditional farmers