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Enhancing Income of Tribal Farm Families in East Singhbhum District of Jharkhand Through Pig Farming

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Abstract

East Singhbhum district in Jharkhand comprises of about 25.00 per cent Scheduled Tribe (S.T.) population mostly dwelling in rural areas. Their livelihood depends upon crop production, livestock rearing, seasonal vegetable cultivation in the backyards and forest minor products. With the promotion of improved pig farming the tribal farmers in the district gained interest in commercialization of pig-based farming system. They utilized natural resource judiciously and intensively to make farming profitable. It could be possible by introduction of improved crossbred Jharsuk pigs. Jharsuk pigs had higher productivity and market demand as compared to non-descript breeds. Many pig breeding farms were established along the periphery of district headquarters due to the availability of cheaper feed resources from kitchens and canteens. Farms made easy availability of crossbred piglets for the smaller farms of rural areas. Tribal farm families reared Jharsuk pigs as per their capacity and resource, so that they could maintain and feed the stock efficiently. On an average an adult Jharsuk sow after attaining maturity farrowed at six months interval. Average production of viable piglets was about 16 piglets per annum. Each piglet was sold for a sum of Rs. 3000.00 after weaning. The potential of earning went up to Rs 48000.00 per sow per annum. Similarly, farm families raised castrated male as fatteners and earned Rs 9000.00 per pig within ten months period. This improved the per capita income of tribal farm families significantly.

Keywords: Scheduled Tribe, Crossbred, Farrowed, Fatteners.

Introduction

Jharkhand is a land where mixed farming, integrated farming and diversification in farming exist well since time immemorial. It is almost a complete undulated topography with more than 60.00 per cent land situation either upland or medium land. The agriculture practiced here is heavily rainfall dependent. So, being a rain-fed farming, farmers are well prepared to face the consequence of vagaries of weather. Agriculture is critical, risk prone and diversified. Livelihood depends mostly on agriculture and allied activities. Mono-cropping is prevalent and rice is the most important crop grown by all the farmers. The various activities they do to earn their livelihood are animal husbandry, horticultural crops, agro-forestry, minor forest produce and aqua-culture.

Background behind selection of pig farming

As compared to other livestock species pigs had a great potential to contribute to faster economic return to the tribal farmers, because of certain inherent traits like high fecundity, better-feed conversion efficiency, early maturity, short generation interval and high marketability. Pig farming also required small investment on buildings and equipments. It had immense potential to ensure nutritional and economic security for the weaker sections of the society.

Thrust area identified for tribal farm families

- Commercialization of pig farming (Jharsuk breed) in tribal farm families
- Strengthening of pig based integrated farming.
- Maximization of income using farm yard and kitchen residues as feed for pigs to reduce cost of production and profit maximization.

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The aim of the case study was to evaluate the impact of Jharsuk pig farming in East Singhbhum of Jharkhand. Other aspect of the study involved the extension methodologies used for the dissemination of pig farming among tribal families. Methodology designed to execute for wider dissemination of pig farming included motivation, awareness and skill development training on:

- Improved pig breed/ cross bred pigs to maximize productivity.
- Housing management
- Balanced feed management
- Health care and disease management
- Reproduction management and
- Marketing management

Methodologies followed

- Front Line Demonstrations on improved breeds suitable for the farmers and region depending upon market demand were demonstrated. Most widely adopted breed is T&D (Jharsuk). Thirty-five demonstrations were conducted based on assessment of breeds, nutrition, supplementation, pregnancy management, etc based on pig farming as seen in table 1.

(Source: Annual report KVK, East Singhbhum, 2017)

- Market value of Jharsuk was better compared to desi pigs. It could be maintained under semi-intensive system of farming; hence cost on expensive shed was not required. It was mostly black in color so the local tribe liked to keep black colored pigs the most. Jharsuk pigs were disease tolerant; could thrive well under scavenging and grazing conditions. So, the cost of production was also less. Wider dissemination of Jharsuk pigs over non-descript Desi pigs was the first intervention chosen. To make the improved breeds of pig available to the farm families, the experts identified some resource rich and motivated farmers to start improved pig breeding farms. It was done to have easy availability of improved breeds of piglets for the small and marginal farmers of the district.
- On farm trials on need based identified problems were designed and conducted on regular basis. Trials on breeds assessment, feeding management, disease management like piglet anemia, feeding during pregnancy gave encouraging result.
- Exposure visits of trainees to the breeding farms of successful entrepreneurs for experiential learning, adoption of improved crossbred pigs farming and experience sharing.
- Follow-up programs, diagnostic services, field visits were regularly organized at farms.
- Need based skills for vaccination, castration, first aid was given on the spot on their animals and trained. Vaccination for the prevention of disease like Swine Fever and Foot and Mouth disease were demonstrated in the programme. Parasitic control and its importance were also prioritised for health management.
- Refresher training programmes, workshop on marketing strategies, farmer to farmer interactions were held on and off campus regularly.
- Collaborated programmes with District Animal Husbandry department further added momentum in the growth and dissemination of pig farming as many trained farmers were financially supported by the department to start pig breeding farms with an aim to ensure availability of best quality piglets to the small and marginal pig farmers.
- Articles, success stories, pagers, were published on different pig farm technologies.
- Television documentaries, radio talks, etc. were regularly recorded and telecasted/ broadcasted.
- Successful farmers were regularly invited to interact during training session with new trainees during training programme.

Few Successful Stories of Pig Breeding Farms

Case I- Torch Bearer of Pig Farming

Retd. Prof. Jarome Soreng, at Village Gorgora (Baliguma) immerged as a successful pig entrepreneur in East Singhbhum district of Jharkhand. The dream came true by the sincere endeavor of Mr. Soreng. T & D pig breed (registered name Jharsuk) was demonstrated in his farm in 2007 and the outcome was a turning point for all the farmers of this region. In the year 2008 the farm became a center for exposure and learning skill for the farmers of the district.

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Table 1: Performance of Jharsuk over non-descript desi pigs

Parameters	Jharsuk				Desi			
	Mean	S.D	S.E	Mean +/- S.E	Mean	S.D	S.E	Mean +/- S.E
Age at Maturity(days)	275.48	4.28	0.09	275.48+/-0.09	316.82	6.40	0.13	316.82+/-0.13
Age at first farrowing(days)	386.00	14.42	0.29	386.00+/-0.29	442.1	9.29	0.19	442.1+/-0.19
litter size at birth (no.)	8.57	0.34	0.01	8.57+/-0.01	5.844	0.44	0.01	5.844+/-0.01
litter size at weaning (no.)	7.95	0.35	0.01	7.95+/-0.01	3.838	0.37	0.01	3.838+/-0.01
Average weight of piglet at birth (kg)	1.04	0.06	0.00	1.04+/-0.00	0.3586	0.03	0.00	0.3586+/-0.00
Average weight of piglet at weaning (kg)	9.09	0.32	0.01	9.09+/-0.01	3.874	0.41	0.01	3.874+/-0.01
Farrowing Interval (days)	183.30	4.46	0.09	183.30+/-0.09	275.66	5.00	0.10	275.66+/-0.10
Weight at maturity (kg) at 10 months of age	69.78	3.61	0.07	69.78+/-0.07	26.54	2.16	0.04	26.54+/-0.04

(Source: Annual report KVK, East Singhbhum, 2017)

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Mr. Soreng became a role model for the pig growers of the region. He was frequently invited in programmes organized by Krishi Vigyan Kendra to share his valuable experiences in pig farming. By the end of the year 2008 more than 100 new farmers were University awarded prize in the field of breeding and dissemination of Jharsuk pig in the region. The strength of the farm reached up to 100 pigs by the end of the year 2008. In 2009, the constant monthly net income received was about Rs 30,000.00. In the same phase, Mr. Soreng, being interested in on farm research, carried studies on Desi pigs vs. Jharsuk pigs and performance of Ghungroo females x Jharsuk male.

Name of the farmer	Prof. Jerome Soreng
Village	Gorgora, Jamshedpur
Block	Jamshedpur
Address (Village & P.O.)	East Singhbhum, Gorgora, Baliguma, Jharkhand
Contact details	09835141347
Landholding (in hectare)	0.9
Irrigated (in hectare)	0.7
Un-irrigated (in hectare)	0.2
Membership details	Krishi Vigyan Kendra, East Singhbhum, Scientific Advisory Committee (progressive farmer)

He proved that keeping Jharsuk was feasible, profitable, market driven. He got encouraging results in crosses of Ghungroo and Jharsuk. By the year 2010 the supply of piglets from his farm reached beyond Jharkhand, i.e. to W.B. and Orrisa. Jerome Soreng started integrating Fish cum Duck cum backyard Poultry cum pig along with crop and vegetable production with an aim of better utilization of resources and recycling of farm waste. He managed the pig feeds mostly by feeding kitchen wastes and farm products. He was the torch bearer for hundreds of farmers to adopt pig farming as an enterprise: More than 500 farmers are brought and exposed in the farm to adopt the farming using low cost techniques of pig as well as integrated farming model.

Innovations and integration

- Digital weighing balance: It was installed to weigh pigs of all age groups (weight ranging from 1 kg to 300kg). Marketable finishers whose body weight range between 70 to 250 kg and more can be conveniently weighed. Animals from all the sheds can be brought to the weighing chamber conveniently and without overlapping any chamber.
- Sprinklers were set for cooling during summer afternoons.
- Farm produce were processed and packed by self-designed machineries. In the process farm waste like paddy husk, broken rice, vegetable leaves, roots, unmarketable produces, weeds, etc were obtained. These by-products were superiorly utilized for better feed conversion, therefore reducing in cost of production of livestock.
- Efficient utilization of manpower- On an average full-time engagement of Mr. Soreng and his team in his pig based integrated farming system was achieved.
- Mechanization- Feeding and garbage management both were done with self-made self-designed appliances and equipment making job drudgery free.
- Natural habitat for farrowing in sow: His experience in reproductive management, especially farrowing of sow in a warm, dark and dry pan proved safe and highly productive. Since temperature in summer was very high (went as high as 45^0C), he experienced high mortality therefore, innovation made was farrowing chamber in thick walled, thatched, false ceiling, and preferably darker shed in which piglets were farrowing safely.
- Backyard poultry farming: Poultry breeds- Jharsim (55 in no. each) were reared for meat and egg production respectively. The birds were managed using farm waste and kitchen waste. The average daily egg production was two dozen. It is sold and money generated was revolved for day today expense.

Fig. 1. Farmwaste feed management

Fig. 2. Exposure visit by tribal rural youths

Fig. 3.Farm monitoring by J. Soreng

Fig.4 Tribal farmwomen visiting the farm

- Early vegetable production: Mr Jerome planned to execute time bound agriculture. He cultivated vegetables with an aim to bring produce early to the market bringing higher return

Case II - Setting an example among Santhal tribe- Mangal Murmu

Shri Mangal Murmu, a dedicated young entrepreneur who became pig breeder with about 20 females (sow) and four males (boar) in his farm named *Sagen* Pig Breeding Farm. The soft spoken, sober and hard working Murmu strongly believes in success through commercial pig breeding farm.

Name of the farmer	Shri Mangal Murmu
Village	Bhagabandh, Jamshedpur
Block	Jamshedpur
Address (Village & P.O.)	Pipla, East Singhbhum, Jharkhand
Contact details	08002594563, 09334362678
Landholding (in hectare)	2.2
Irrigated	None
Un-irrigated	2.2

He started with Jharsuk pigs in a small premise with an aim of expanding the farm after getting thorough exposure in it. He transformed himself from a pig keeper to a pig breeder in a short time span of three years. The proven technologies like flushing of sows, care and management of pregnant and farrowing sows, weaning at 56 days post farrowing, use of iron supplement in piglets, early castrations, etc. were adopted and executed in his farm. Krishi Vigyan Kendra, East Singhbhum used his farm as a model for other trainee farmers to have exposure. Hundreds of farmers visited his farm and adopted pig farming as an additional income generating source. Farmers frequently took tips from him on pig husbandry. Mr. Murmu showed through his success script what young graduates can do with dedication and hard work. In the year 2014-15, he has been selected by the Department of Animal Husbandry, Government of Jharkhand for a project worth Rs. 6,00,000.00 (Six lakh only) to establish a Pig Breeding Farm.

Now he is capable in producing more than 300 piglets of improved T&D breed every year for the farmers of Jharkhand and adjoining areas. His annual income calculated in the year 2016-17 was Rs 6,50,000.00 (Six lakh fifty thousand only). He was recognized and rewarded by KVK and Birsa Agricultural University, Ranchi as the best pig entrepreneur of the year.

Case III- Young entrepreneurs as a pig breeder- Anand Sanjeet Purty

Shri Anand Sanjeet Purty left the job of job of a banker in Maharastra to start an entrepreneurship at his own home at Mirzadih under Boram block very close to Jamshedpur. He started pig farming after acquiring training in KVK, East Singhbhum. In late 2013, he started with two males and 6 female piglet of Jharsuk breed. In the year 2014 he got a subsidized project of Rs 6,00,000.00 (Rupees Six lakh only) by Jharkhand Animal Husbandry department to establish a pig breeding unit of

Name of the farmer/ entrepreneur	Anand Sanjeet Purty
Marital status and gender	Unmarried (Male)
Date and place of birth	10-03-1984, Jamshedpur
Postal address	Gudrubasa, Sonkhosai, Near TirkeyMaidan, DimnabRoad, Mango, Jamshedpur-831018.
Educational qualification	B.Com, Marketing and Finance Management
Resources owned or leased in by the farmer	
Land (in hectare)	0.4
Irrigated (in hectare)	NA
Animal resources- Piggery unit	male(boar)-7 female(sow)- 32 other categories- 87

20 sow and 4 boars. He concentrated fully in the farming putting his best knowledge to establish a successful breeding farm. He was able to produce more than 350 piglets of outstanding pedigree by the end of 2018. Farmers of Jharkhand, West Bengal, Odissa and Chattishgarh now visit to buy piglets from his farm. He also supports newcomers in establishing new farms for meat production. Recently he started processing pork in a small quantity and serving as ready to eat products.

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Fig. 5. Exposure visit organized for farm women group

Fig. 6. Field visit to rural youths

Fig. 7 and 8. Farmers' team from Meghalaya visiting Mangal Murmu's farm

Fig. 9. Modern farm shed of Anand with healthy Jharsuk pigs

Fig. 10. Documentation of success story documentation of success story by News 18.

Fig. 11. A happy Sumita Tirkey in her farm

Fig. 12. Weaned piglets ready for selling

Recently he started processing pork in a small quantity and serving as ready to eat products. His innovative ideas were well adopted and appreciated by fellow farmers. He owns pig shed with 15 farrowing sheds in the farm. Guard rails were designed in such a way that they could be fitted in the farrowing pen for five to seven days to prevent crushing of piglets in the pen and removed when piglets were about a week old. Each shed was 200 sq. ft. in area with feeding and water drinking space. He shifted the sow in farrowing pen two weeks before the expected delivery date. The system of farming adopted was semi-intensive system. It gave better results in farrowing, improved fecundity, comparatively healthier and better weaning rate of piglets were obtained in his farm. He adopted following practices in his farm:

i. Good variety cross-breeds were selected from different farms for rearing.
i. Clean and hygiene sheds were maintained for all the category of stock.
ii. Balanced feeding as per recommendation was given to the livestock.
iii. Preventive and therapeutic measures for disease control were adopted
iv. Marketing of pigs as per demand, 70 to 80 kg body weight for castrated males, 10 to 12 kg for piglets were sold with good returns.

Anand developed his own techniques and innovated few needful practices:

i. Good quality crossbred piglets were produced in the farm using best quality male and female pigs. Inbreeding was strictly discarded. Outstanding crossbred males (boars) were regularly introduced in the farm from government pig farms.
ii. Removable guard rails were designed to minimize cost and space management.
iii. Wallowing pits for summer management when the temperature goes up above 370C.
iv. Feeding protocol was developed for different age groups.
v. Semi-intensive farming for breeding stock so that the sow and boar could be kept healthier and active.
vi. Dried kitchen waste, industrial food waste, dried azolla, etc. were introduced for cost minimization and to increase profitability.
vii. Castration technologies adopted and trained to other youths.

Many new farmers are trained on new innovative techniques in pig farming. Good and healthy piglets are developed for easy availability and at cheaper rate.

Mass coverage of Anand for technology dissemination:

i. Shri Anand has been covered by Krishi Darsan Ranchi for his success in Pig breeding farm in 2017-18.
ii. His work has been documented and recorded by *Annadata*, News 18 as a success story and was telecasted.
iii. Review documentation by DD Ranchi in 2018
iv. Local dailies have covered his successful enterprises for mass dissemination.

Awards and recognition: Received best Livestock Farmer's award of the district in the field of pig farming in the year 2018 by Birsa Agricultural University, Ranchi during Agrotech Kisan Mela, under the recommendation of Krishi Vigyan Kendra, East Singhbhum, Jharkhand.

Table 2: Annual economics of Anand Sanjeet Purty's farm

Year	No of adults/ fatteners sold	No of piglets sold	Expenditure per year (Rs)	Net Income per year (Rs)
2014	9	34	96000	79000
2015	16	235	120000	627500
2016	18	260	120000	710000
2017	21	285	136000	872000
2018	20	283	140000	852400
2019	22	288	159000	863500

Case IV- A successful woman entrepreneur

Women in Indian culture are treated as a power house of wealth, food and strength and all these components are the basic fundamentals of a healthy livelihood. Woman empowerment is not a new concept in Indian mythology. The women were powerful, are powerful and will always be powerful as time and again they have proved it. Only their potentials have to be identified and used. Mrs. Sumita Tirkey is one such example of a woman power from Village Kalamati, near Parsudih in Jamshedpur block of East Singhbhum District in Jharkhand, India.

encouraged her to increase the capacity of her farm to 20 + 4 breeding animals and target of 75 finished males for pork production.

By seeing the success of Sumita the women flock of her community got inspired and motivated to go for animal farming. By the end of the year 2019, Sumita's turn over in her farm could reach to about Rs 14,50,000.00 (Fourteen lakh fifty thousand only) with a net profit of about Rs 10,00,000.00 (Ten lakh only) in one year.

The salient features Mrs. Sumita adopted in the farm are-

1) Rearing of cross breed pigs (Jharsuk).
2) Selection of the best quality males and females for breeding.
3) Good practices like balanced feeding, clean housing, disease prevention and treatment.
4) Good marketing.
5) Routine and timely farm operations.

The economics of her farm are as follows-

Table 3: Animal, strength, animal sold chart

Year	No of breeding stock (Female and male no.)	No of piglets sold	No of meat animals sold (for pork production)
2017-18	10+2	60	20
2018-19	20+4	170	50
2019 till December	20+4	250	70

Table 4: Income expenditure chart (year wise)

Year	Expenditure in Rs	Recurring expenditure Rs	Gross income Rs	I inc
2017	3,00000	30000	280000	-5(
2018	1,50000	80,000	875000	64
2019	1,00000	1,20000	1380000	1,1(

Social achievements-

- More than fifty farm families are benefitted by Sumita every year.
- More than a hundred farm women are motivated to set their own enterprise.
- Sumita has become a celebrity for her society.

Media coverage and awards-

- Sumita has been recognized as promising farm woman by the KVK and Birsa Agricultural University in 2019.
- She has been documented by *Annadata* and telecasted on News 18 Bihar-Jharkhand in the month of November 2019.

The overview of the average production and profitability performance of improved pig farming in East Singhbhum district in Jharkhand has been depicted in tables 5 and 6.

Summary and Conclusion

The case study on pig farming showed wide dissemination of crossbred pig farming. Jharsuk pigs were well adopted by the tribal pig keepers. The productivity, profitability and income generation in pig farming attracted new entrepreneurs in this field. The methodologies adopted by the KVK in disseminating crossbred Jharsuk pigs had good impact both in rural as well as urban pig farming communities. The significant increase in pig farms, number of farmers involving in farming, and profitability in pig farming gave impetus to replicate the programme to other potent tribe pockets of other district and adjoining states. It had proved to be a significant achievement in meeting the animal protein deficiency among the tribe by enhancing the availability of cheaper source of pig meat (pork). The key to success stories and vast dissemination of improved pig farming could be:

- Need of farming community was assessed, their needs, gaps and strength were studied, intervention points were identified before selection of dissemination of improved pig farming in rural and urban East Singhbhum.

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Table 5: Performance parameters and economics of pig farming (in rural farms)

Rural pig farm	Expenditure (Rs)				Gross income	Net income	Remark
	Piglet (if purchased)	Feed cost	Miscellaneous	Total			
Fattener production	3000	3000	500	6500	10000	3500	If male piglet bought by the farmer
Breeding sow (per year 2 farrowing)	--	4500	2000	6500	42000	35500	If breeding sow was maintained
Fatteners	--	3000	500	3500	10000	6500	If raised from own farm male piglets
Breeding male	--	4000	500	4500	--	--	(If boar was maintained
If crossed with a boar and not maintained at own farm	--	--	--	3000	--	--	When boar was hired, cost for two mating/year

(Source: Annual report KVK, East Singhbhum, 2017)

Table 6: Performance chart of pig production in East Singhbhum between 2006-2020

Performance	2006-10	2011-15	2016-20	Remark
Pig breeding farms in the district (more than 6 adult pigs per farm)	14	25	52	For piglets as well as fattening pigs. Most of the farms were managed with kitchen waste.
Trained pig farmers of the district	355	765	2951	Mandatory and sponsored programmes
Trained pig farmers of other district	131	255	455	Saraikela khersawan, west Singhbhum, Khunti-
Exposure visits to farmers (total no. of farmers)	46	221	1355	By KVK, ATMA and other NGOs
Cross bred pig (in surveyed urban farms and villages)	15%	42%	85%	Most of the farmers kept cross bred pigs
Slaughter of pigs in local Haats/ market) in rural areas	3	7	12	Surveyed in 10 panchyat level Haat of the district
Pig slaughtered in urban area (Jamshedpur)/ week	16	26	58	Leaving Thursday
Sale of fatteners to other district and state per year	500	1550	3450	Approximate data received from pig farms and traders
Sale of piglets post weaning within district, inter district and inter state	1350	2750	4110	
Cost of meat (pork)/ kg	Rs. 80	Rs.120	Rs.190	Seasonal variation is observed

(Source: Annual report KVK, East Singhbhum, 2017)

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- Capacity building of target groups through exposures, interactions, training and experience sharing with successful entrepreneurs.
- Regular follow-up programmes, farmer to farmer interaction, and expert –farmer interactions were conducted regularly.
- Pig farming could be a profitable, income generating and employment generating occupation if scientific methods of breeding, feeding, housing, disease control and marketing were managed efficiently.

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