PIG VALUE CHAIN STUDY IN JHARKHAND

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 Needless we take responsibility for any weakness in the study.

-- Authors
Contents

LIST OF TABLES .................................................................................................................. v
LIST OF FIGURES ................................................................................................................. v
EXECUTIVE SUMMARY ....................................................................................................... vii
1. INTRODUCTION ................................................................................................................ 1
2. OBJECTIVES AND METHODOLOGY ............................................................................. 2
3. OVERVIEW OF PIG SECTOR AT ALL INDIA LEVEL .................................................. 3
4. OVERVIEW OF PIG SECTOR IN JHARKHAND ............................................................. 7
5. VALUE CHAIN ASSESSMENT AT PRODUCTION CLUSTERS ..................................... 11
   5.1 Introduction to Study Area ......................................................................................... 11
   5.2 Sample Distribution .................................................................................................. 12
   5.3 Socio-Economic Profile of Pig Rearing Households ................................................ 13
   5.4 Production Practices and Marketing of Pigs ............................................................. 16
       SIMDEGA ................................................................................................................... 16
       JHINKPANI ............................................................................................................. 22
   5.5 Value Chain Mapping At Production Clusters ......................................................... 27
   5.6 Farmers’ Cost-Benefit Analysis ................................................................................ 28
6. MARKET ASSESSMENT .................................................................................................. 31
   6.1 Structure of Pork Markets ......................................................................................... 31
       Profile of markets at Consumption Centers ............................................................... 31
       Profile of markets at Production Cluster ................................................................... 38
   6.2 Value Chain Mapping At Consumption Centers ..................................................... 39
6.3 Cost-Benefit Analysis for Butchers ............................................................................ 40
7. CHALLENGES ALONG THE VALUE CHAIN............................................................... 42
   7.1 Input Stage ................................................................................................................ 42
   7.2 Production Stage ........................................................................................................ 42
   7.3 Marketing at Producers’ Level .................................................................................. 43
   7.4 Butchers’ Level ......................................................................................................... 44
   7.5 Processing of Pork .................................................................................................... 44
8. POTENTIAL AREAS FOR INTERVENTION ................................................................. 45
   8.1 Breed Improvement ................................................................................................... 45
   8.2 Input Stage ................................................................................................................ 46
   8.3 Feeding Management ............................................................................................... 47
8.4 Housing management .................................................................................................................. 48
8.5 Extension Services......................................................................................................................... 49
8.6 Marketing Models.......................................................................................................................... 50
8.7 Processing of Pork........................................................................................................................ 52
9. FUTURE OUTLOOK FOR THE SECTOR......................................................................................... 53
REFERENCES ....................................................................................................................................... 54
LIST OF TABLES

Table 1 Allocation of funds to Jharkhand under NLM (2014-15 to 2018-19) .......................... 6
Table 2 Structure of pig population in Jharkhand over the census period 2003-2012 ............ 8
Table 3 Profile of Pig farmers ......................................................................................... 13
Table 4 Status of Basic Amenities .................................................................................. 13
Table 5 Livestock Ownership ......................................................................................... 14
Table 6 Land Ownership ................................................................................................. 14
Table 7 Sources of Income .............................................................................................. 14
Table 8 Yearly Income .................................................................................................... 15
Table 9 Farmers’ Cost-Benefit Analysis of pig production (INR) ........................................ 29
Table 10 Markets covered under the Study ..................................................................... 31
Table 11 Structure of Regular pork markets ................................................................... 32
Table 12 Structure of Weekly Pork Markets .................................................................... 32
Table 13 Cost-Benefit Analysis of Butchers .................................................................... 41
Table 14 Specific feed requirements for pigs in different age groups ................................. 47
Table 15 Composition of concentrate feed for pigs in different age groups ....................... 48
Table 16 Approximate amount of dry feed as per weight .................................................. 48
Table 17 Requirement of floor area, water & air space in pens for various classes of pigs .... 49
Table 18 Trading price, operating cost and margins for supply of 40 pigs (over 4 weeks) to four butchers ............................................................................................................. 51

LIST OF FIGURES

Fig 1 District wise percentage share of total pig population in Jharkhand ......................... 9
Fig 2 District wise percentage share of indigenous breed population in Jharkhand .......... 9
Fig 3 District wise percentage share of exotic/crossbred population in Jharkhand ............ 10
Fig 4 Caste-wise distribution of total rural population ..................................................... 12
Fig 5 Average Herd Size of Pigs Simdega ....................................................................... 16
Fig 6 Years involved in pig rearing Simdega ................................................................... 16
Fig 7 Composition of herd size Simdega ......................................................................... 16
Fig 8 Reason for pig rearing Simdega ............................................................................. 17
Fig 9 Distribution of Breed Simdega ............................................................................... 17
Fig 10 Production Activity Simdega ................................................................................. 17
Fig 11 Separate shed for pigs Simdega ............................................................................. 17
Fig 12 Feeding Mechanism Simdega .............................................................................. 18
Fig 13 Main feed for pigs Simdega .................................................................................. 18
Fig 14 Controlled Natural Mating Simdega ..................................................................... 18
Fig 15 Castration of male pigs Simdega ........................................................................... 18
Fig 16 Veterinary Service Provider Simdega ................................................................... 19
Fig 17 Awareness of Vaccination Simdega ....................................................................... 19
Fig 18 Awareness of Deworming Simdega ...................................................................... 19
EXECUTIVE SUMMARY

Introduction: This study has been commissioned under Jharkhand Opportunities for Harnessing Rural Growth (JOHAR), a World Bank funded project to be implemented by Jharkhand State Livelihood Promotion Society (JSLPS). Livestock is one of the key components of the project. Through interventions in this sector, the project aims to empower the farmers, to respond positively to the changes in emerging markets, with the support for improved production practices, product quality and standards, better marketing strategies and; realization of value addition opportunities. The study specifically deals with pig sector in Jharkhand under this component. In order to identify the specific activities to be taken up under the project, detailed analysis was required. Accordingly, the study has two components, i) value chain assessment and; ii) market assessment. For value chain assessment, the study was carried out in the two intervention blocks of JSLPS, namely, Jhinkpani in West Singhbhum district and Simdega in Simdega district. It helped in identifying the challenges along the pig value chain at production clusters of the project. The second component, market assessment has been carried out in the four major consumption centers of the state namely, Ranchi, Bokaro, Dhanbad and East Singhbhum. The rural markets covered at the production clusters also from a part of the market assessment. While the value chain assessment highlights the supply side issues, market assessment puts forward the demand side issues. The analysis as a whole will help in discover the potential of the sector and identifying the market-led interventions.

The study is based on both primary and secondary data sources. The nature of information collected is both qualitative and quantitative in nature. The findings of the study have been broadly divided into five sections, i) Overview of pig sector in Indian and Jharkhand; ii) Value chain assessment at production clusters; iii) Market assessment; iv) Challenges along the value chain and v) Potential areas of intervention to strengthen the pig value chain and finally, we put forward the future outlook for the sector.

All India Scenario: Pig rearing is considered as one of the potential sources for enhancing livelihoods of tribal households and other weaker sections of the society. Besides, pork has a high nutritious value which can help in addressing the gaps in nutrition intake at national level. Despite the potential, the growth of pork sector in India remains limited owing to the social stigma associated with pig rearing and consumption of pork. Further, Muslim community, which comprises of 14.2% of India’s population do not consume pork due to their religious injunctions.

As per the Livestock Census 2012, the total pig population in India is 10.3 million, of which 76% is the indigenous breed. The population of exotic breeds has increased by 12.7% from 2003 to 2012. Eastern and North Eastern regions of India comprise of 63% of India’s pig population. Jharkhand is the third leading state with a population of 0.96 million (nearly 10% of the India’s total pig population) followed by Assam and Uttar Pradesh. As per NSSO 70th Round, at all India level, for every 1000 households, 18 households reported the ownership of pigs with average number of pigs owned to be 54.9 per 1000 households. Jharkhand demonstrates much higher density of pigs with respective figures at 64 and 202.9.
Pork production in India is estimated to be 464 thousand MT for FY 2014-15. Despite having nearly 10% of the India’s total pig population, Jharkhand accounts only 4% of the total pork production. India’s average meat yield is only around 35 kg/animal as against the world average of 78kg/animal. The country’s pork import was recorded to be 527 MT in 2015, an increase of 28% from the previous year. As per NSS 68th Round, the monthly per capita pork consumption of India is negligible at only nine grams in rural areas and six grams in urban areas per 1000 thousand persons.

Jharkhand is one of the main consumption centers of pork in domestic market. The rural monthly per capita consumption for pork in the state is 18 grams and seven grams in urban areas per 1000 thousand persons. India’s pork consumption is clearly divided into two segments. First, consumption in the form of fresh pork and second, high value imported processed pork products. Major buyers of processed pork are hotels and restaurants, which cater to international tourists and wealthier Indian consumers. At present, India’s domestic processed segment is minuscule. However, on a positive note, experts envision high prospects for increasing demand of pork in the country owing to increasing realization of its nutritious value and increasing investments of state governments in the sector.

**Jharkhand Overview:** Dumka has the highest percentage of total pig population dominated by indigenous breed in the state. Ranchi ranks first in terms of percentage share of exotic/crossbred pigs. Social factor has a major role to play in pig production and consumption of pork in the state. It is mostly reared by those belong to the Scheduled Castes and Scheduled Tribes and has a stigma attached to it by upper castes. Considering the aforementioned factors, the demand for pork is lower as compared to that of chicken or chevon. However even to cater to this limited demand, there is scarcity of live pigs. Given the limited scale of production, the pig value chain is limited to pig rearers and butchers. To enhance pig production, *Jharsukh* breed (earlier known as T&D, a crossbred of Tamworth and Desi) is being promoted in the state. Jharkhand Breeding Policy 2011 is directed towards the same. The breed was developed keeping mainly three factors into consideration, viz., black color, high reproductive capacity and faster growth rate. The development of this breed led to the emergence of many commercial farms in the state over the years.

**Market Assessment:** For the purpose of market assessment, in total 10 markets were covered across six districts of the state, the four major consumption centers and the two production clusters. The rural markets covered at the production clusters were all weekly markets, whereas at the consumption centers comprised of both regular and weekly pork markets.

In case of regular pork markets, the location signifies the role of social factor. It was only in Jamshedpur that the butcher shop was located amidst the main city. The rest were located in isolation, at the peripheries of main city. With respect to the procurement of live pigs, there is clear demarcation in patterns between the two structures of markets. The difference is also attributable to the scale of operation. The butchers in weekly markets rely heavily on supply from villages within the range of 40-60 km. Procurement becomes a major challenge for them at the time of peak season in winters. On the contrary, the butcher in regular markets need to ensure constant supply of pigs. Their main source of supply is private commercial farms in Jamshedpur and Odisha. Maximum supply is from Jamshedpur. Even in case of supply from individual farmers, contacts are
maintained. Farmers can contact them whenever they are ready to supply pigs. Some of the butchers like the one in Dhanbad, a wholesaler of pork, procure pigs from mandis of UP and Maharashtra. In the given case, a supplier is involved in the value chain. There are no markets for live pigs in the state largely owing to the limited scale of production. The weight and size of pig procured depends on the availability of live animal and the demand for pork.

**Slaughtering** is carried out within the shop premises in both the cases. The dressing percentage of meat is about 70-80% on an average. The selling price of meat falls in the range of INR 140-200/kg. The leftover part of pig is sold at about half of the rate to that of meat, if unprocessed. Value addition through traditional primary processing could be noticed in only two of the markets in Dhanbad. Sausages made of pig intestine are sold at the same rate to that of meat. In Ranchi markets, blood pakoras are made signifying different option for value addition. On-the-spot consumption of meat after getting it cooked in nearby make shift dhabas is a common phenomenon.

With respect to the **consumer preferences**, what matters most is freshly slaughtered and good quality tender meat. Meat with more fat content is not preferred, which is usually the case for heavier pigs. Consumers are indifferent to gender of the pigs. In terms of color, black is a general preference. Winters is the peak season of pork consumption.

**Value Chain Assessment**: The two blocks, where the study has been carried out namely, Jhinkpani and Simdega differ significantly in terms of the specifics related to pig ownership and; production and marketing practices. A probable reason for this is the caste composition of population in the two blocks. In Jhinkpani, about 79% of the total rural population belong to castes groups other than SC and ST. The population under SC and ST categories forms only 21% of the share. On the contrary, ST population dominates in Simdega with 66.84% of the total rural population. Though at present, few households are engaged in pig rearing in Jhinkpani, it is an emerging region for the sector. It is largely due to its proximity to markets, such as in Odisha. The region illustrates the modern practices related to production and marketing of pigs. Simdega, on the other hand represents the traditional form of production packages. Thus, the study of two blocks will help in providing us with different dynamics present on ground.

In **Simdega**, pig production is a traditionally accepted phenomenon given the dominance of tribal populace. Majority of the farmers are involved in both breeding and fattening practices. Normally, 1-2 male pigs are kept in a village for breeding with no specificity to breed, while the rest are castrated. If required, piglets are bought within the village or procured through sharing with other farmers. Generally, female piglets are bought as male piglets are not sold easily. This is because male castrated pigs are preferred for fattening. A very small percentage of the farmers have up till now opted for improved breeds, which they procured from nearby village called ‘Khunti toli’ @INR 200/kg of live weight. For some, unavailability of cash in hand restricts them to purchase piglets of improved breeds. Important to note, farmers in Simdega keep their pigs even for two to three years before selling whereas, the weight of the pig remains below 60 kg. It poses strong implications on the profitability of the enterprise. Farmers even tend to incur losses in such a scenario. The improved breeds are however sold in less than a year to avoid their management requirements like feed, housing, medicine, etc. The pigs are sold not in case of emergency or from the viewpoint of
marketing but on occasions like wedding/festivals or at their maturity. The commercial approach towards pig production is yet to proliferate its roots among tribal populace of Simdega.

In Jhinkpani, pig ownership is very limited among the JSLPS producer group given the dominance of other backward castes. It is limited to scheduled castes members of the group. It is largely a landless community and thus maintain limited scale of production. Majority of them do not maintain separate sheds for pigs. The piglets are bought for fattening purposes from nearby villages. As a result of which, the farmers are aware and ready to accept improved breeds for rearing. Selling of slaughtered pigs in weekly markets is more prevalent than the marketing of live pigs. Income generation is the main reason for pig rearing. The average selling age of pig is less than 18 months. The average selling weight falls in the range of 40-80 kg. The practices are evident to emergence of a commercial angle in pig production.

Some of the common factors found in the two blocks are- i) feeding mechanism (open scavenging plus stall feeding) and the components of feed (edible kitchen waste and rice husk); ii) preference for black color; iii) castration of male pigs for fattening purpose; iv) dismal state of veterinary services; v) no awareness of vaccination services; vi) marginal increase in awareness regarding deworming as a result of initial project interventions; vii) pig mortality due to diseases; viii) live pigs are sold to local traders at door-step against on-the-spot cash payments; ix) weight measurement is purely based on estimation and; x) the negligible presence of extension services at present.

Challenges along the Value Chain

**Challenges at Producers’ Level:** i) the pig rearing households with traditional mindset are uncertain to opt for improved breeds due to lack of awareness; ii) Unavailability of required vaccination services in the state; iii) dismal state of health care due to negligible presence of veterinary services in the production clusters; iv) Unavailability of formal credit to upscale production/adopt improved breeds; v) Unavailability of land, specifically in case of Jhinkpani poses issue of housing space for pigs, which restricts the upscaling of production activity; vi) Shortage of feed and water; vii) Profit margins are less than optimal level; the farmers are unaware of the right age and right selling price of pigs and viii) access to markets is an issue specifically to remotely located villages.

**Challenges at Butchers’ Level:** i) supply of live pigs is not at par with the demand for pork; ii) no rural haats for live pigs; iii) acquiring license for slaughtering; iv) occasional bans on open slaughtering and; v) absence of any organized slaughtering. In addition to this, there is absence of any processing of pork in the state.

**Potential areas of Intervention to strengthen the pig value chain:** i) promotion of Jharsukh breed; ii) provision of veterinary services through community livestock service providers; iii) provision of vaccination for key diseases, i.e., classical swine fever, Foot and Mouth Diseases (FMD) and if required, for porcine cysticercoses; iv) availability of formal credit; v) appropriate feeding and housing management; vi) provision of extension service to farmers related to production practices and marketing; vii) extension services at butchers’ level; viii) adoption of better marketing strategies and ix) exploiting potential for value addition through processing of pork.
Future Outlook for the sector: Pig sector in India has traditionally been the victim of social disapproval largely due to the filthy perception associated with pigs. This customarily shunned status of pig has played a huge role in limiting the growth of the sector in India. However, in view of the factors like high nutritious value of pork; pig rearing being a potential source of livelihood generation and increasing investments by State Governments in the sector, experts envision high prospects for increase in demand of pork over the coming years. Jharkhand has been one of the leading states in terms of live pig production in India. However, its percentage share in total pork production of the country is merely 4%. It may be attributed to the dominance of desi breed in the total pig population of the state, which translates in to low meat yield. Scarcity of required vaccinations and inefficient inter-state marketing channels are the two significant contributing factors that prevent the growth of pig sector in the state. Such a scenario is indicative of the fact that Jharkhand has not been able to contribute substantially to the increasing demand of pork at national level. Thus, it is important to strengthen the pig value chain in the state with adequate interventions both, at the ground level and at the policy level. An approach towards improved package of production practices, better marketing strategies and strengthening of market linkages, especially with the processing units within and outside the state is the need of the hour. On one hand, it will help in creating huge avenues in terms of livelihood generation for the small and marginalized farmers and; the landless community of the state. Whereas on the other hand, it will enable the state to effectively cater to the local, state, national and international demand of pork.
1. INTRODUCTION

This study has been commissioned under Jharkhand Opportunities for Harnessing Rural Growth (JOHAR), a World Bank funded project to be implemented by the Jharkhand State Livelihood Promotion Society (JSLPS). Livestock is one of the key components of the project. It is an important source of enhancing rural livelihoods. The project aims to empower the farmers, to respond positively to the changes in emerging markets, with the support for improved production practices, product quality and standards, better marketing strategies and; realization of value addition opportunities. In this regard, detailed value chain analysis and market assessment was required to identify the specific activities to be taken up under the project. The study specifically deals with pig sector in Jharkhand under the livestock component of the project.

The interventions will be implemented through a cluster based approach. It will be taken up through formation of producer groups in the targeted villages of the project. The approach would facilitate scale of production which in turn will generate marketable surplus. It mandates greater understanding of markets within and outside the state of Jharkhand.

Accordingly, the study has two components. First, a detailed value chain analysis of pig sector in the production clusters, where the project is being implemented. The two districts covered are Simdega and West Singhbhum. The value chain assessment emphasizes on different aspects like pig ownership, housing and feeding management, breeding practices, health care and marketing. The approach helped in identifying the challenges along the pig value chain at production clusters of the project.

The second component of the study is a market assessment at the four major consumption centers of the state, viz., Ranchi, Bokaro, Dhanbad and East Singhbhum and; the markets covered at the production clusters. The assessment emphasizes on, i) demand and supply of pig meat in the state; ii) profiling of different markets where farmers sell their produce and the prices fetched by them and; iii) the present marketing channels and their effectiveness vis-à-vis the value being captured by farmers. Besides, the study also captures the state/national and international demand and supply situation to have a comprehensive understanding of the sector to enable planning from a long term perspective. While the value chain assessment highlights the supply side issues, market assessment puts forward the demand side issues. The analysis as a whole will help in discover the potential of the sector and providing a road map to the potential market-led interventions.

The findings of the study have been broadly divided into five sections, i) Overview of pig sector in India and Jharkhand; ii) Value chain assessment at production clusters; iii) Market assessment; iv) Challenges along the value chain and v) Potential areas of intervention to upgrade the pig value chain and finally we put forward the future outlook for the sector.
2. OBJECTIVES AND METHODOLOGY

The broad objective of the study is to undertake an in-depth assessment of pig sector in the JOHAR project areas in order to identify the key activities that can be taken up under the project. The specific objectives of the study are as follow:

1. Carry out a detailed value chain analysis of pig sector in the given production districts and identifying the key issues in production practices;
2. Conducting a market assessment in the major consumption districts to identify the situation of demand and supply in the state and the scope of increasing production;
3. Based on an analysis of production and marketing systems, identify interventions and strategies which can be carried out through the project.

The study is based on both primary and secondary data. The secondary information comprises of detailed review on existing literature on pig sector; policy environment in the state and; a statistical overview of pig sector at the national and the state level.

For the value chain analysis, primary data was collected at each level of the chain in line with specific objectives of the study. The information collected through primary sources is both qualitative and quantitative in nature. The research tools used for qualitative data collection include key informant interviews (KIIIs) at all levels of value chain; focus group discussions (FGDs) with the producer groups of JSPLS and direct observation. The quantitative data collection mainly includes the KIIIs conducted with market players and the household level survey of pig rearing households in the two intervention blocks of JSLPS, namely, Simdega in Simdega district and Jhinkpani in West Singhbhum district. The detailed criterion followed for sample distribution has been mentioned under section 5.2 of the report. Based on the outcomes of FGDs with producer groups, the value chain was traced at the production clusters. The pork markets covered in these areas contributed to the section of market assessment.

Different pork markets were covered at the four major consumption centers of the state, namely, Ranchi, Dhanbad, Bokaro and East Singhbhum for the purpose of market assessment. The tools used for data collection at the market include key informant interviews (KIIIs) with butchers and direct observation. The analysis helped in briefing the structure of pork markets in the state; comprehending the demand and supply situation of pork; the key challenges at marketing level and the scope of increasing production.
3. OVERVIEW OF PIG SECTOR AT ALL INDIA LEVEL

Pig farming is considered as one of the potential alternatives for enhancing the economic status of the tribal households and other weaker sections of the society. A small-scale pig production ensures a year-round employment to otherwise seasonally employed farmers. From the viewpoint of production, the benefits of pig farming are as follows:

- Pigs are genetically superior to other animals in terms of feed conversion efficiency; they attain more unit weight per kg of feed consumed as compared to other meat producing animals.
- Pigs can utilize a wide variety of locally available feed like fruits, vegetables, grains, forages, fodder, kitchen waste, crop residues, etc. and convert it into valuable nutritious meat; they can even consume grass and other plants.
- Pigs are prolific breeders with shorter generation interval. A sow can reproduce for the first time within 8-9 months of age. They can farrow twice a year at the rate of 6-12 piglets in each farrowing and;
- Pig manure can be used as organic fertilizer in agricultural farms and as meal in the fish ponds.

From the viewpoint of marketing, the benefits of pig rearing are as follows:

- The dressing percentage accounts for about 65-80% of the live weight in pigs whereas it does not go beyond 65% in other livestock species like goats.
- Pork has high nutritious value with high fat and low water content. It is rich in vitamins like thiamin, niacin and riboflavin.
- Pigs rapidly store fat which has a demand in industries of poultry feed, soap, paints and other chemical industries.
- Pig farming offers quick returns as a pig attains marketable weight within 6-8 months.
- Pig products like pork, bacon, ham, sausages, etc. have a good demand in domestic as well as export markets.

As per the 19th Livestock Census of 2012, the total pig population in India accounted to be 10.3 million. It has declined by 7.5% over the census period 2007-2012 and by 17.6% over the census period 2003-2007. Indigenous breeds form about 76% of the total pig population. The share of exotic/crossbred has recorded an increase of 12.7% during the span of nine years i.e. from 2003 to 2012. The five leading states in pig production are Assam (1.63 million); Uttar Pradesh (1.33 million); Jharkhand (0.96 million); Bihar (0.65 million) and West Bengal (0.65 million). Pigs account for only 2% of the country’s livestock population (Intodia, 2016). Evidently, as per NSSO data on livestock ownership, piggery accounts for only 0.56% (July 12-Dec. 12) and 0.37% (Jan 13- June 13) of the total area of land used for animal farming (NSS, 70th Round). At the national level, for every 1000 households, 18 households reported the ownership of pigs. The average number of pigs owned is 54.9 per 1000 thousand households. The respective figures for Jharkhand is 64 and 202.9 (NSS, 70th Round).
Pork production was estimated to be 464 thousand MT in India during FY 2014-15. It has increased marginally by 1.4% during the span of five years, i.e., from 2009-10 to 2014-15. It contributes to 8% of country’s protein requirement. Jharkhand contributes only 4% of the country’s pork production. The leading states in this respect are Uttar Pradesh (30%), the North-Eastern states (25%), Bihar (15%) and West Bengal (6%). On an average, India’s meat yield of indigenous breed is around 35kg/animal as against the world average of 78 kg/animal. It has been argued that indigenous breeds are smaller in size, have slower growth rate, produce less number of litters and have low quality pork (Intodia, 2016).

India’s pork import was recorded to be 527 MT in the year 2015, higher by 28% from the previous year. In India, the demand of imported pork is mainly in hotels, restaurants, institutional and high-end retail sector. The major suppliers of pork in India are Belgium, Sri Lanka, Spain, Italy, and Netherland followed by UK and Germany. The major imported pork products are pork belly, chops, loin, tenderloin, neck, shoulder, spare ribs, bacon, ham, salami and sausages. The basic tariff on imports of pork and pork products applied by India is 30% (Intodia, 2016). India’s share in the world’s pork exports accounted to be only 0.004% in the year 2017.

As per the NSS 68th Round, for every 1000 households in India, only 11 households in rural areas and five households in urban areas reported to be the pork consumers. Accordingly, the monthly per capita consumption of pork is negligible in India, i.e., only nine grams in rural areas and six grams in urban areas per 1000 persons (NSS, 68th Round). The main consumption centers of pork in India are the North-Eastern states followed by Bihar, Jharkhand, West Bengal, Goa and Kerala. Particularly in Jharkhand, for every 1000 households, 20 households in rural areas and six households in urban areas reported to be the pork consumers. Monthly per capita consumption is 18 grams in rural areas and seven grams in urban areas per 1000 persons (NSS, 68th Round).

The major factors that limit the growth of pork sector in India are; i) the Muslim population in India, which constitutes about 14.2% of India’s total population do not consume pork owing to their religious injunctions; ii) another large section of Indian consumers is apprehensive about cleanliness of domestic pork as pigs are natural scavengers. India’s pork consumption can clearly be divided into two segments. First, consumption in the form of freshly slaughtered meat which is available through unorganized wet markets and meat vendors. The second segment is the high value imported pork products like ham, sausages, bacon, frozen meat and canned meat products. The major buyers for these imported pork products are hotels and restaurants, which cater to international tourists and wealthier Indian consumers. It is to note here that despite being three to four times more expensive than the domestically produced pork cuts, the imported pork cuts are preferred for its quality (Intodia, 2016). This elite clientele in India wants to ensure supply of their pork from the superior pigs of English farms and not from the sort usually seen around the garbage heaps across the country (Doctor and Sally, 2017, ET Bureau).

1 http://www.worldstopexports.com/pork-exports-by-country/, accessed on Aug. 7, 2018
At present, the India’s processed pork segment is very small. However, it is growing at a rapid pace due to upcoming socio-economic and demographic changes. People have started recognizing the nutritious value of pork. It is now increasingly being seen in breakfast buffets, in the western style cafes and the restaurants set up by cooks from the Northeast, whose widespread presence across the country marks the increasing demand for pork at the national level. This demand is being met by the supply from increasing number of pig farms in states like Punjab and Haryana, which are raising foreign breeds like Yorkshire to Landrace pigs and the cross bred animals. The scenario is evident through the consecutive decline in total pig population at national level over the last three Livestock censuses. Currently, the major markets for processed pork in India are limited to few large cities like Delhi, Mumbai, Bangalore, Kolkata and Pune. Also, the domestic processed pork segment is being catered by few organized players. Even most of these processors do not have any integrated value chain and they procure pigs though informal contracts with pig farmers. On a positive note, given the high nutritious value of pork combined with increasing investments by state governments in its processing, experts envision high prospects for increased demand for pork in the country in coming years (Intodia, 2016 and Vikram and Sally, 2017, ET Bureau).

Some of the major challenges at country level in the growth of pig sector are, i) lack of sufficient breeder farms; ii) scarcity of feed and fodder; iii) prevalence of diseases like Classical Swine Fever (CSF), porcine reproductive and respiratory syndrome (PRRS) and, porcine rotavirus; iv) limited availability of vaccines and, v) insufficient slaughter and processing facilities across the country. Some of the other constraints include the social and cultural factor associated with consumption of pork and; majority of pig farmers belong to the lower socio-economic strata, who undertake pig farming on a subsistence basis rather than from a commercial viewpoint (Intodia, 2016).

The Department of Animal Husbandry, Dairying and Fisheries (DAHDF) regulates pork and pork product imports in India. The Government of India’s Food Safety and Standards Authority of India (FSSAI) regulates domestic pork slaughter and the processing sector and; imported pork products as well as tests pork and pork product shipments (Intodia, 2016).

National Livestock Mission

In order to facilitate sustainable development and growth of livestock sector in India across species and regions, Ministry of Agriculture, Government of India launched the ‘National Livestock Mission’ (NLM) in the FY 2014-15. It is a centrally sponsored sub-scheme of White Revolution- Rashtriya Pashudhan Vikas Yojana (GOI, 2016). The activities covered under the mission aim to ensure quantitative and qualitative development in livestock productivity and capacity building of the stakeholders. It focuses on reducing the demand and supply gap of feed and fodder, improving production system in an environment friendly manner, augmenting livelihoods prospects, especially for landless, small and marginal farmers and in rain fed areas. It would primarily lead to an overall socio-economic development of livestock rearers through risk management and improved availability
of quality animal products to consumers. There is a mandate that if viable proposals are not received from all the States/UTs with in the first quarter of the financial year, the funds will be re-allocated by the department/NABARD between the states/UTs with more demand (GOI, 2018). The Mission has four sub-missions, namely,

- Sub- Mission on livestock Development;
- Sub-Mission on Pig Development in North Eastern Region
- Sub-Mission on Feed and Fodder Development
- Sub-Mission on Skill Development, Technology Transfer and Extension

With respect to the specific component on piggery development, it has been stated that the North Eastern States have relentlessly been seeking support for the all-round development of piggery in the region. Under this sub-mission, there will be support to State Piggery Farms and import of germplasm for the eventual benefit of masses. It would contribute in facilitating protein rich food in the eight states of the region. In case of Jharkhand, the funds allocated under NLM as central share up till now has been given in Table 1.

### Table 1 Allocation of funds to Jharkhand under NLM (2014-15 to 2018-19)

<table>
<thead>
<tr>
<th>Year</th>
<th>Funds Allocated (in lac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-19</td>
<td>511</td>
</tr>
<tr>
<td>2017-18</td>
<td>447</td>
</tr>
<tr>
<td>2016-17</td>
<td>630</td>
</tr>
<tr>
<td>2014-15</td>
<td>838</td>
</tr>
</tbody>
</table>


Note: No allocation was made to the States/UTs for the year 2015-16 as the committed liability exceeded the Budget estimates in 2014-15 (Kumar, 2016)

The three year (2014-15 to 2016-17) data base managed for the states by the Ministry of Agriculture for NLM delineates that zero amount of funds have been utilized by the state of Jharkhand in regard to assistance for state pig farms as yet. The initiatives are required on part of the state in utilizing the opportunity under NLM for piggery development.

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4. OVERVIEW OF PIG SECTOR IN JHARKHAND

In Jharkhand, the social factor plays a major role in pig rearing and consumption of pork. It is associated mainly with the tribal populace and the lower-caste communities while considered as stigma by the upper castes. The common visibility of pigs around the heaps of garbage associates pig production and pork consumption with dirt and diseases. Being natural scavengers, pigs tend to even eat human waste. It not only raises doubts about hygiene and quality of pork but also, contributes in stigmatizing the communities that consume pork. This customary shunned status of pig plays such a huge role that people do not even talk of pork and it is considered as ‘bad meat’. The regular pork shops are mostly located in isolation to main city and markets. The social fabric associated with pig starkly distinguishes it from other livestock.

In view of the mentioned factors, the scale and presence of value chain related activities varies from region to region within Jharkhand depending upon the caste distribution of the population. The factors also contribute in limiting the demand for pork in the state as compared to chicken or chevon. However, even to cater to this limited demand, there is a scarcity of live pigs. Given the limited scale of production, pig value chain in Jharkhand is limited to pig farmers and butchers. There are no rural haats for trading of live pigs in the state.

In order to enhance pig production in the state, ‘Jharsukh’ breed of pigs (earlier known as T & D, a crossbred of Tamworth and Desi) was developed at the veterinary college of Ranchi during late 1980s after putting in years of research and development. The desi breed had been taken from Purnea district of Bihar. The development of T&D breed emerged mainly on the lines of three factors- black color, high reproductive capacity and faster growth rate (KII). It is being widely promoted in the region since then. ‘Jharkhand Livestock Breeding Policy 2011’ is directed towards the same. It is aimed towards ensuring regular supply of T&D pigs to second line of breeders for the success of pig improvement program. Establishment of pig farms in different zones is proposed to be undertaken in the policy in order to supply T&D pigs. Also, there is provision to provide services and imparting training to farmers to boost pig production in the region for improving rural economy. Additionally, the policy also mentions of giving consideration to starting of bacon factory at Ranchi and organized slaughter houses in different districts to boost pig production.

The development of T&D breed led to the emergence of many commercial farms in the state over the years. There are success stories of farmers,

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who took up pig rearing as a commercial enterprise. However, this phenomenon is largely limited to the major consumption centers of the state like Ranchi, Jamshedpur, Dhanbad and Bokaro. Table 2 represent the structure of pig production in the state over the census period 2003 to 2012.

Table 2 Structure of pig population in Jharkhand over the census period 2003-2012

<table>
<thead>
<tr>
<th>Census Period</th>
<th>Total pig population</th>
<th>Indigenous pig population</th>
<th>Exotic/crossbred Pig population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Number</td>
<td>Percentage change</td>
<td>Total Number</td>
</tr>
<tr>
<td>2003</td>
<td>1,108,000</td>
<td>--</td>
<td>1,090,000</td>
</tr>
<tr>
<td>2007</td>
<td>732,479</td>
<td>-33.9%</td>
<td>645,553</td>
</tr>
<tr>
<td>2012</td>
<td>962,367</td>
<td>31.3%</td>
<td>920,625</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>41,742</td>
</tr>
</tbody>
</table>


The data reflects considerable fluctuations in the structure of pig population in the state over the census period 2003 to 2012. Considering the population of exotic/crossbred, it gained momentum after 2003 and marked an increase of about five times by the year 2007. Its share in the total pig population also increased significantly from 1.6% to 11.86% over the period. However, in the subsequent years, the population of exotic/crossbred pig could not sustain itself and decreased by about 52% by the year 2012. It is indicative of the fact that the pigs of improved breeds were consumed fast and contributed to the increasing demand of pork at the national level; but were not reproduced at the same scale. Consequently, indigenous pig population continues to form a major share (95.66%) of the total pig population in the state.

The trend of the total pig population in Jharkhand can be compared to the statistics at the national level. As mentioned earlier in the report, the total pig population of the country has recorded a decline over the census period 2003 to 2012 owing to the increased demand of pork. On the other hand, the total pig population in the state marked an increase of 31.3% over the period 2007-2012 as a result of notable increase in the indigenous pig population. It shows that Jharkhand has not been able to contribute to this increasing demand of pork and pork products at the national level.

Jharkhand has been an exporter of pigs to the North Eastern states, specifically to Guwahati in Assam and Dimapur in Nagaland through intermediary agencies. However, due to constraints during transportation like force payments to police, the volume of exports have decreased considerably over the years. Efforts were also made in the past to tie up with Arohan Foods in Guwahati, a major supplier of processed pork products in the country. However, the deal could not work out due to the issues involved in transportation of the animal (KIIIs). It calls for an action to be taken up at the policy level,
which can smoothen the process of transportation of pigs to another state. It will help in ensuring markets for the increased production of pigs in the native state.

Figures 1-3 depict the district-wise percentage share of Jharkhand’s pig population as per the Livestock Census 2012. Figure 1 provides the ranking of districts according to total population. Dumka is leading with 10.23 percentage share. Simdega is at sixth position with 5.76 percentage share and West Singhbhum at 15th position with 2.85%. Figure 2 provides the ranking of districts in terms of indigenous breed population. Dumka leads with 10.6%, Simdega is at fifth position with 6% and West Singhbhum is at 16th rank with 2.82%. Figure 3 ranks the districts according to the population of crossbred/exotic breed. Ranchi leads with nearly 20%; Simdega gets dropped down to the 14th position with 2.5% and West Singhbhum improves to 9th position with 3.54%.

**Figure 1 District wise percentage share of total pig population in Jharkhand**

![District wise percentage share of total pig population in Jharkhand](source)

**Figure 2 District wise percentage share of indigenous breed population in Jharkhand**

![District wise percentage share of indigenous breed population in Jharkhand](source)
Figure 3 District wise percentage share of exotic/crossbred population in Jharkhand

Source: Livestock Census, 2012
5. VALUE CHAIN ASSESSMENT AT PRODUCTION CLUSTERS

The present section represents the findings from the field at the production clusters. It first introduces the study area and lays out the method of sample distribution for individual farmers’ survey. Next, it presents an overview of the socio-economic profile of the sample households. It then discusses current practices along the value chain in the two study blocks consecutively. Based on the findings, the existing value chains at the production cluster have been mapped out. The section ends with the cost-benefit analysis of pig rearing for a farmer.

5.1 Introduction to Study Area

For the initial phase of project implementation, JSLPS has selected two blocks for intervention in pig production namely, Simdega in Simdega district and Jhinkpani in West Singhbhum district of Jharkhand. Simdega District is situated in the Southwestern part of the state. It borders with Chhattisgarh in the West and Odisha in the South. Within Jharkhand, it is surrounded by Gumla in the North and, Ranchi and West Singhbhum in the East. It comprises of 10 blocks, namely, Simdega, Kurdeg, Bolba, Thethaitangar, Kolebira, Bano, Jaldega, Pakartanr, Bansjore and Kersai.

Simdega is primarily a rural district with about 94% of its population living in rural areas. The only town in the district is Simdega. The district has the highest percentage of Scheduled Tribes (ST) in the state, i.e. 70.2%. In addition, there are about 8% Scheduled Castes (SC); about 3% Muslims and the rest of population consists of other caste Hindus. The major tribal groups in the state are Oraons, Kharia, and Mundas, etc.

As per the Simdega district profile, it is amongst the least developed districts in the country. The economy of the district depends primarily on agriculture, forest produce, cattle rearing, mining activities and other small commercial activities. The main crop of the area is paddy followed by millets, mustard, Niger and maize. Other crops that are cultivated here are wheat, gram, pea, soybean, groundnut, etc. The main forest produce are Mahuwa, Chironjji, Lah, Kendu, leaves, jack fruit, black berry, etc. Agriculture in Simdega is in a primitive and underdeveloped state. It is characterized by lack of irrigation, absence of technological inputs, inadequate marketing facilities and infrastructure developments. With respect to livestock, despite a large population of milch cattle, milk yield is poor in the district. Lack of awareness together with local varieties of breed contribute in making it less productive. In terms of percentage share of total pig population in Jharkhand, Simdega is at sixth place; fifth in case of indigenous breed and; 14th in case of exotic/crossbred.

West Singhbhum is the largest district of Jharkhand and lies in the Southern part of the state. It is located at a height of 244 Meter above the sea level. It borders with Saraikela- Kharsawan district of Odisha in the East; Keonjhar, Mayurbhanj and Sundargarh Districts of Odisha in the South and; on the

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5 [http://www.jharkhand.gov.in/web/simdega/district-profile](http://www.jharkhand.gov.in/web/simdega/district-profile), Accessed on July 7, 2018
Pig Value Chain Study in Jharkhand

West, it shares its boundary with district Simdega in Jharkhand and Sundargarh in Odisha. The soil composition of the district makes it largely unsuitable for cultivation. It is only in Kolhan that presence of black soil makes it fertile. Rice is the main crop of the district. In terms of percentage share of total pig population in the state, the district comes at 15th rank; 16th in terms of indigenous breed and 9th in case of exotic/crossbred.

With respect to pig rearing and consumption of pork, social and cultural aspects play a crucial role especially in a traditional rural setting. As mentioned earlier, it is primarily associated with the tribal populace and the scheduled castes. Thus, depending upon the caste distribution of population as depicted in figure 4, the scale and presence of pig value chain related activities vary in the two regions.

*Figure 4 Caste-wise distribution of total rural population in Jhinkpani & Simdega*

![Figure 4](image)

Source: Socio-Economic Caste Census, 2011

In Jhinkpani, about 79% of the total rural population belong to other castes groups whereas the population under SC and ST categories forms 21% of the share. On the other hand, ST population dominates in Simdega with 66.84% of the total rural population. In consonance to the mentioned caste profile of the population, the specifics to pig ownership differ significantly in the two blocks. This in turn also had implications on the sample distribution of the farmers surveyed under the study as discussed further.

5.2 Sample Distribution

As stated in the former section, the caste profile of the rural population in Jhinkpani is heavily dominated by other caste groups. As a result, the pig rearing households were found to be significantly fewer and limited to only two out of the four project targeted villages in the block. Accordingly, *purposive sampling method* was used to select the sample households from the two villages, namely, Asura and Choya. In total, 32 pig rearing households were surveyed in the block. In Simdega, given the dominance of ST population, larger sample size has been covered. In total, 128 pig rearing households were surveyed in the block from eight villages using the *proportionate sampling method*. The selection

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of sample households was in proportion to the total number of pig rearing producer group members in the villages.

The sample households from both the blocks comprise of both JSLPS producer group members and non-group members. Since the project is at its initial stage, the practices were found to be similar across the two groups and thus, have been discussed collectively. The approach followed is apt to familiarize with the current practices being followed at the ground level. Given the significant difference in sample size, the production practices have been discussed separately for the two blocks under section 5.4.

5.3 Socio-Economic Profile of Pig Rearing Households

The present section provides a brief overview of the socio-economic profile of the sample pig rearing households in both the blocks. The analysis indicates an overall vulnerable situation of the households engaged in the occupation.

Table 3 Profile of Pig farmers

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Details</th>
<th>Percentage of the Households Surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Jhinkpani</td>
</tr>
<tr>
<td>Age</td>
<td>Up to 35 years</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>36 to 55 years</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Above 55 years</td>
<td>3</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>72</td>
</tr>
<tr>
<td>Religion</td>
<td>Hindu</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Christian</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Muslim</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Sikh</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>--</td>
</tr>
<tr>
<td>Caste</td>
<td>SC</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td>ST</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>OBC</td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary Data

Table 4 Status of Basic Amenities

<table>
<thead>
<tr>
<th>Factors</th>
<th>Percentage of the Households Surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jhinkpani</td>
</tr>
<tr>
<td>1. Types of House Owned</td>
<td></td>
</tr>
<tr>
<td>Kaccha House</td>
<td>64</td>
</tr>
<tr>
<td>Pucca House</td>
<td>10</td>
</tr>
<tr>
<td>Semi-pucca House</td>
<td>26</td>
</tr>
<tr>
<td>2. Sources of drinking water</td>
<td></td>
</tr>
<tr>
<td>Piped Water</td>
<td>26</td>
</tr>
<tr>
<td>Own Well</td>
<td>--</td>
</tr>
<tr>
<td>Own Hand pump</td>
<td>--</td>
</tr>
<tr>
<td>Public Well</td>
<td>--</td>
</tr>
<tr>
<td>Other</td>
<td>74</td>
</tr>
</tbody>
</table>
### 3. Hours of Electricity Received

<table>
<thead>
<tr>
<th></th>
<th>Jhinkpani</th>
<th>Simdega</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Electricity</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td>1-5 Hours</td>
<td>61</td>
<td>56</td>
</tr>
<tr>
<td>5-10 Hours</td>
<td>22</td>
<td>6</td>
</tr>
<tr>
<td>10-20 Hours</td>
<td>--</td>
<td>2.3</td>
</tr>
<tr>
<td>20-24 Hours</td>
<td>--</td>
<td>0.7</td>
</tr>
</tbody>
</table>

### 4. Availability of Toilet

<table>
<thead>
<tr>
<th></th>
<th>Jhinkpani</th>
<th>Simdega</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Toilet</td>
<td>84</td>
<td>12</td>
</tr>
<tr>
<td>Household owned Toilet</td>
<td>--</td>
<td>79</td>
</tr>
</tbody>
</table>

Source: Primary Data

### Table 5 Livestock Ownership

<table>
<thead>
<tr>
<th>Livestock</th>
<th>Percentage of the Households Surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jhinkpani</td>
</tr>
<tr>
<td>Cattle</td>
<td>6</td>
</tr>
<tr>
<td>Buffaloes</td>
<td>--</td>
</tr>
<tr>
<td>Sheep</td>
<td>--</td>
</tr>
<tr>
<td>Goat</td>
<td>22</td>
</tr>
<tr>
<td>Backyard Poultry</td>
<td>35</td>
</tr>
</tbody>
</table>

Source: Primary Data

### Table 6 Land Ownership

<table>
<thead>
<tr>
<th>Factors</th>
<th>Percentage of the Households Surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jhinkpani</td>
</tr>
<tr>
<td>1. Category of land owned</td>
<td></td>
</tr>
<tr>
<td>Cultivable Land</td>
<td>3</td>
</tr>
<tr>
<td>Non-Cultivable Land</td>
<td>20</td>
</tr>
<tr>
<td>Landless</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Distribution of Cultivable Land*</td>
<td>Simdega</td>
</tr>
<tr>
<td>Below 1 acre</td>
<td></td>
</tr>
<tr>
<td>1-2 acres</td>
<td></td>
</tr>
<tr>
<td>2-3 acres</td>
<td></td>
</tr>
</tbody>
</table>

Note*: In Jhinkpani, negligible percentage of the sample households own cultivable land

Source: Primary Data

### Table 7 Sources of Income

<table>
<thead>
<tr>
<th>Sources</th>
<th>Percentage of the Households Surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jhinkpani</td>
</tr>
<tr>
<td>Agriculture</td>
<td>0</td>
</tr>
<tr>
<td>Livestock</td>
<td>71</td>
</tr>
<tr>
<td>Farm Labor</td>
<td>6</td>
</tr>
<tr>
<td>Non-farm Labor</td>
<td>65</td>
</tr>
<tr>
<td>Service</td>
<td>0</td>
</tr>
<tr>
<td>Business</td>
<td>35</td>
</tr>
<tr>
<td>Non-timber Forest Produce</td>
<td>22</td>
</tr>
<tr>
<td>Other</td>
<td>26</td>
</tr>
</tbody>
</table>

Source: Primary Data
Table 8 Yearly Income

<table>
<thead>
<tr>
<th>Intervals</th>
<th>Percentage of the Farmers Surveyed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jhinkpani</td>
</tr>
<tr>
<td>0-20,000</td>
<td>3</td>
</tr>
<tr>
<td>20,000-40,000</td>
<td>41</td>
</tr>
<tr>
<td>40,000-60,000</td>
<td>48</td>
</tr>
<tr>
<td>60,000-80,000</td>
<td>7</td>
</tr>
<tr>
<td>80,000-100,000</td>
<td>--</td>
</tr>
<tr>
<td>More than 100,000</td>
<td>--</td>
</tr>
</tbody>
</table>

Source: Primary Data

Simdega

As mentioned earlier in the report, there is dominance of tribal populace in Simdega block. Out of the total 128 sample pig rearing households, about 88% of them are Scheduled Tribe. 94% of them own cultivable land. However, 87% of them are small and marginal farmers and only 11% are medium farmers. Further, out of the total cultivable land with the sample households, only 35% is irrigated. The main source of irrigation were reported to be farmers' own well with other sources like public well, pond water and hand pump. The main kharif crops grown in the region are paddy, black lentils and ragi followed by peanuts and almonds. Among the Rabi crops, seasonal vegetables like potato, tomato and onions are prominent. However, in absence of adequate irrigation facilities, only a small percentage of the farmers surveyed i.e. about 10% opt for Rabi crops. Besides agriculture and non-farm labor, livestock rearing came out to be important sources of livelihood generation for the sample households. As reported, the annual income for about 88% of them is below INR 60,000 with 28% of them being even below INR 20,000. Such extreme low level of income signifies the economic vulnerability of the pig rearing households. 73% of them reside in kachcha houses. 25% of the sample households do not have any electricity while about 56% of them receive power only for 1-5 hours a day. The figures outline a better picture in terms of toilet facility with the sample households in the block. A significant percentage of the households are keeping cattle, goats and backyard poultry.

Jhinkpani

All of the 32 pig rearing households surveyed in Jhinkpani block are Scheduled Caste Hindus. A majority i.e. about 77% of them are landless while the rest possess non-cultivable land. In absence of any agricultural activity, their main sources of livelihood are livestock rearing and non-farm labor followed by petty businesses, non-timber forest produce and other occupations like handicrafts, etc. The annual income for about 90% of them falls in the range of INR 20,000 to INR 60,000. The poor economic status is rather discernable in their low standard of living. More than 60% of them live in Kachcha house. Majority of them receive electricity only for 1-5 hours a day while about 13% do not have electricity at all. As high as 84% of them do not
use toilets. Goat keeping and backyard poultry were found to be other prominent livestock alternatives with the pig rearing households.

5.4 Production Practices and Marketing of Pigs

The discussion pertaining to the production practices elucidates different aspects associated with pig rearing. It includes the specifics to pig ownership; housing management; feeding practices; breeding practices and; health care management. Subsequent to production practices, the discussion will focus on the marketing dimensions of the pig farmers. It will be followed by the mapping of pig value chain at the production cluster and the cost-benefit analysis of the farmers.

SIMDEGA

**Pig Ownership**

The average herd size of pigs per household in Simdega is about 3.11 adult pigs and 1.34 piglets for the sample households. Pig rearing is an accepted phenomenon among the tribal populace of the block. It is implied through figure 6 that about 47% of the farmers have taken up pig rearing within last 0-2 years while about 36% of them have been doing it ‘since always’. The former also includes those who have lost/ sold their pigs some years ago and have restarted it in recent years. The composition of herd size is significantly inclined towards castrated pigs (fig 7). This is because castrated pigs are preferred for fattening purposes as their growth rate is better as compared to uncastrated ones. The reason behind pig rearing for about 53% of the sample households is both income generation and self-consumption of pig meat. The other majority (about 42%) is doing it from the perspective of income generation (fig 8).
Improved breeds (locally called as *challani*) are yet to make a place among the farmers of Simdega (fig 9). From the perspective of future preference as well, the farmers are inclined towards desi breed. According to them, feed would be a problem for improved breeds and they would need more attention and care. Some of farmers also mentioned that improved breeds are more mischievous and thus difficult to manage. Majority of the farmers are engaged in both breeding and fattening of pigs. In terms of color, black is the clear preference among the farmers. In Simdega, pig rearing also complements to agricultural activity as more than 50% of the sample households are using pig manure as organic fertilizers in the field. It is believed to work best for onion farming (fig10).

**Housing Management**

In Simdega, majority of the sample households (more than 90%) of them are maintaining separate sheds for pigs. There are two probable reasons for this. First, there is no issue of land ownership among the sample households. Second, most of them are engaged in both breeding and fattening practices and thus require space. However, a larger percentage of them (about 78%) have sheds with mud floors only. Mud floors are not sustainable in pig housing and are required to be rebuilt twice a year. Only 15% of the farmers are maintaining concrete sheds. During day time, pigs are being kept outside the home by a large majority of the farmers.
**Feeding Mechanism**

The farmers in Simdega are primarily practicing both stall feeding and open scavenging to feed pigs. However, a significant percentage i.e. about 27% of them rely solely on stall feeding. The prominent sources of stall feed are edible kitchen waste and rice husk. The average price of rice husk paid by the sample household is INR 5/kg. The daily feed requirement for an adult pig is 2-3 kg of rice husk if combined with edible kitchen waste.

**Breeding practices**

As mentioned above, breeding pigs is common amongst pig rearing households in Simdega through natural mating. In majority of the cases (94%), natural mating is not controlled. A sow gets into coupling during open scavenging with any boar available. The prevalent practice for controlled mating is on sharing basis; a farmer with a boar and the other with a sow, divide the piglets among them equally for fattening. Out of the small percentage of the farmers involved in controlled mating, about 57% of them prefer desi breed only. Castration is a prevalent phenomenon among the pig farmers involved in fattening of pigs.
**Health Care**

The status of veterinary services is in a dismal state in the block (fig 16). Negligible percentage (2%) of the sample households has access to government veterinary service with 25% of them do not have access to any veterinary service provider at all. About 25% of them are dependent on chemist shop in Simdega town for medicines. A small percentage of them have access to a private veterinarian who prescribes the medicines over phone call based on symptoms reported. In case of a visit, the charges go up to INR 30-40/injection. In total, one visit costs up to INR 150-200. In remote locations like Bhanwarpani, this amount goes up to INR 300 as well due to distance. A considerable majority, i.e., 29% of them still rely solely on traditional methods of treatment. For wounds, they use phenyl and Dettol. Many of them reported to have encountered small white cysts in pork on slaughtering. These cysts are indicative of porcine cysticercoses, it requires further scientific investigation. However, they are unaware of the methods to diagnose this condition pigs in live pigs. In most cases, the pork with cyst is discarded. In Badabarpani, on the other hand, though farmers do not sell such pork, but some of them reportedly use it for self-consumption. The practice poses serious implications as the disease is zoonotic in nature. The consumption of pork with cysts can cause neuro-cysticercoses leading to epilepsy in humans. As reported, even the butchers don’t check for it during transaction. There is a need for basic meat inspection training for all involved in slaughtering of pigs. There is negligible awareness about vaccinations among the farmers (fig 17), although some of them knew about deworming (fig 18); it is largely due to the initial project intervention in the area.
The prevalence of diseases is one of the major challenges in the block in pig rearing. Nearly 70% of the farmers have reported pig mortality in last one year. Based on which, the average number of pigs died for total sample came out to be exorbitantly high, i.e., 2.82 pigs per household. This includes both adult pigs and piglets. The main reasons reported for piglet mortality are crushing under the sow and cold stress followed by farrowing and diarrhea, etc (fig 19). The prominent diseases/symptoms found in adult pigs are heavy breathing, fever and loss of appetite followed by pox lesions and presence of cyst in the meat (fig 20). Since there has not been any veterinary support available or scientific identification of diseases carried out, it is not possible to name the common diseases impacting the pigs.

**Marketing**

Out of the total sample households in Simdega, about 38.2% of the farmers have not yet gone for selling of pig in either form- live or slaughtered. The probable reasons behind this are- i) some of the farmers have recently entered into the occupation; ii) some of them rear pigs only for self-consumption during social occasions like weddings or festivals and; iii) for some, their pigs died before they could sell them. Selling of slaughtered pigs is practiced by about half of the sample households in the block (fig 21). However, it is more of a customary practice than being commercial in nature. Evidently, the phenomenon is more prevalent during occasions like wedding or festivals as noted in about 75% of the cases. Further, the village being a prominent place of selling, the practice of giving pork on credit to fellow villagers has been recorded in about 40% of the cases. The average
price of pork was estimated to be around INR 150/kg. A little over half the sample households are selling live pigs (fig 21). Live pigs are primarily being sold to local traders from nearby villages against immediate cash payments. About 13% of these farmers have reported receipt of advanced payments for live pigs. It is indicative of lack of adequate supply of live pigs against the given demand. No scientific method of weighing pigs is followed, the transactions are solely based on estimations by the buyers. Nearly 50% of the sample households opt for selling live pigs after two years of their age (fig 22). For more than 60% of the farmers, the average weight of pig at the time of selling lies below 60kg (fig 23). Only about 16% of the farmers are selling pigs weighing more than 80kg. This is due to the fact that a large majority in the block is still rearing desi breed, which attains low weight on maturity. The present scenario poses economic implications on pig farmers as discussed later in the report. Presently, farmers are able to sell only one pig in a year on an average. In absence of regular supply of pigs, they do not maintain any long-term relationship with the buyers. Winter season and the occasions of wedding/festival are more preferred time for selling of live pigs. In about 66% of the cases, buyers do not look for diseases before buying. However, if a pig is found with any disease, they do not buy it. As evident through fig 24, the marketing of pig is more of need based, predominantly at the time of social occasion. In less than half of the cases, are selling pigs on attaining a certain age. There are cases when farmers agree to sell on being insisted by buyers, indicative of scarcity of pigs. Nearly, in about 94% of the cases, the last pig sold was a male/castrated pig. The average amount received on selling of live pig was estimated to be INR 145/kg of live weight.
It is to note here that the present statistical analysis is based on the small sample of 32 pig rearing households. Though the sample is small, it has aptly provided an overview of the present status of production practices and marketing of pigs in the block.

**Pig Ownership**

The average herd size of pigs per household in Jhinkpani is approximately two adult pigs with negligible number of piglets (fig 25), mainly because the majority is involved in fattening of pigs only. The scale of production for SC community is limited by their landlessness. It is interesting to note that the farmers are engaged in the occupation either ‘since always’ or have started recently (fig 26). The composition of herd size shows more or less an equal division among male, female and castrated pigs. The main reason for pig rearing in the block is income generation (fig 27). Rearing of crossbred has started taking its roots (fig 28). About 25% of the sample households are currently rearing crossbred, whereas for about 70%, it is their future preference due to its faster growth. The color preference for all of them is black as it is more in demand and thus easy to market. The mentioned factors imply the presence of a
commercial angle in pig production in the block. However, the farmers are largely confined to fattening practices only at present due to the unavailability of land (fig 29). They buy piglets of about three months old @3000-3500/piglet from villages within the range of 40-50 km preferably around May-June i.e. before monsoon and before sowing.

**Housing Management**

In Jhinkpani, about 80% of the sample households do not maintain separate shed for pigs. The two probable reasons for this are; i) unavailability of land and ii), majority of them are engaged in only fattening of pigs and thus do not require space for farrowing/piglets. The sheds at present are all with mud floors. During day time, majority of the farmers keep their pigs outside home.

**Feeding Mechanism**

Expenditure on feed is the main component of the total cost of pig production. The farmers are primarily practicing both stall feeding and open scavenging to feed pigs (fig 31). The prominent sources of stall feed were found to be edible kitchen waste and rice husk (fig 32). It is mainly the rice risk which is purchased and adds to the cost. The price as reported is between INR 5-10/kg. Per day feed requirement of an adult pig per day for rice husk was reported to be 3-4 kg.

**Breeding practices**

In Jhinkpani, out of the total sample, limited number of farmers are engaged in breeding. The breeding process is through natural mating only. No payments are made for natural mating. About 25% of the breeder farmers follow controlled mating. Half of them prefer desi breed while the other half prefer crossbred. The male pigs used for breeding purpose are mostly owned by the households themselves or by the neighbors. Castration is a prevalent practice among the pig farmers.
Health Care

The status of veterinary services is quite dismal in the block (fig 33). About 35% of the sample households do not have any access to veterinary services, while 10% of them are still relying solely on traditional methods for treatment. Some of the traditional method used by them include: they put petrol and red powder mixed in warm water for wounds on feet or heal it with application of sugar; in case of any infection during castration- they would put turmeric and water on it. Interestingly, in order to prevent the occurrence of cysts in meat, they give *gud* and *heeng* two days before slaughtering and believe that this makes cysts disappear. This claim is however difficult to accept, as according to experts, there is no way to diagnose the occurrence of cysts in pigs to begin with. Out of the total sample of 32, 28% of them reported expenses on medicines. On an average, the annual expenditure on medicines was estimated to be INR 225 per pig for these households. There is a negligible awareness of vaccination services among the sample households (fig 34). A small percentage of them is aware of deworming services. This is largely due to the initial project interventions for deworming on ground (fig 35). Consequent to the farmers’
ignorance and poor availability of veterinary services, about 30% of the sample households have experienced pigs' mortality owing to diseases during last one year in the block (fig 36). This percentage is high considering the fact that in Jhinkpani, farmers are mostly engaged in fattening activity only. The average number of pigs died per household in last one year was estimated to be 0.80. On an average, 19% of the sample households have experienced piglet mortality. The main reasons as recorded are during farrowing, cold stress, large litter, crushing under the sow, diarrhea, etc. The prominent diseases/symptoms among adult pigs came out to be heavy breathing, fever, loss of appetite, small pox and presence of cysts in pork as shown in figure 37. High fever and loss of appetite are two of the clinical symptoms of Classical Swine Fever (Bett, et. al. 2014). About 48% of the sample has also pointed out the prevalence of cysts in pork. This disease has largely been out of the purview of the veterinary consideration, since it is not fatal in pigs but has huge implications on human health.

**Marketing**

Out of the total sample of 32, about 23% of the households have not yet gone for selling of either live or slaughtered pigs. This is attributed to the fact that many of them recently entered to the occupation. Commercial selling of slaughtered pigs was found to be the prevalent phenomenon in Jhinkpani. About 77% of the sample households sell slaughtered pigs with the prominent place of selling being weekly rural markets. Giving pork on credit is not a customary practice in the block. The average price for pork they get is INR 160/kg.

About 42% of the sample households reported to be selling live pigs (fig 38). Predominantly, live pigs are sold to local traders only from nearby villages for immediate cash payments. Weighing is solely based on estimations. The average age of selling live pig is less than 18 months in the block. This is true for about 92% of the reported cases (fig 39). Despite young age at the time of sale, the pigs are heavier
in Jhinkpani than the ones in Simdega. In about 83% of the cases, the pigs weighed in the range of 40-80 kg at the time of sale (fig 40). It is attributable to the emergence of improved breeds among the farmers and awareness among the farmers related to right age of selling pig. On an average, only one pig is being sold in a year. Winter season wedding/festival are most preferred occasions to sell pigs. Majority of the farmers are unable to maintain any long term relationship with buyers due to limited production of pigs. Only about 30% of the buyers look for diseases in pigs during transaction. Most of them do not buy pigs if found with any disease. In Jhinkpani, more than 50% of the farmers are selling live pigs at a certain age i.e. about a year, while about 23% of them sell their pigs when they have to buy new ones (fig 41). This is indicative of the commercial angle in marketing of pigs. Predominantly, male/castrated pigs are being sold in the block. The amount received for live pig falls in the range of INR 100/kg to 150/kg of live weight.

To summarize, in Simdega, pig production is a traditionally accepted phenomenon given the dominance of tribal populace. Majority is involved in both breeding and fattening practices. Normally, 1-2 male pigs are kept in a village for breeding with no specificity to breed while, the rest are castrated. If required, piglets are bought within the village or procured through sharing. Generally, female piglets are bought as male piglets are not sold easily. It is because a male piglet after castration will generate higher return due to its faster growth rate. Very small percentage of the farmers have up till now opted for improved breeds, which they procured from nearby village called ‘Khunti toli’ @INR 200/kg of live weight. For some, unavailability of cash in hand restricts them to purchase the piglets of improved breeds. Important to note, farmers in Simdega keep their pigs even for 2-3 years before selling whereas, the weight does not increase substantially with each passing year. However, improved breeds are sold in less than a year to avoid their management requirements like feed, housing, medicine, etc. The pigs are sold not in case of emergency or from the viewpoint of profit making but on occasions like
wedding/festivals or at their maturity, which according to them is 2-3 years. The commercial approach towards pig production is yet to proliferate its roots among tribal populace of Simdega.

In Jhinkpani, pig ownership is very limited among the JSLPS producer group given the dominance of other backward castes. It is limited to scheduled castes members of the group. They are largely a landless community and thus maintain limited scale of production. Majority of them do not maintain separate sheds for pigs. The piglets are bought for fattening purposes from nearby villages. This exposure makes them aware and ready to accept improved breeds for rearing. Selling of slaughtered pigs in weekly markets is more prevalent than the marketing of live pigs. Income generation is the main reason for pig rearing. The average selling age of pig is less than 18 months. The average selling weight falls in the range of 40-80 kg. The mentioned practices are evident to the emergence of commercial angle in pig production in the block.

Some of the common factors found in the two blocks are- i) feeding mechanism and the components of feed; ii) preference for black color; iii) castration of male pigs for fattening purpose; iv) dismal state of veterinary services; v) no awareness of vaccination services; vi) marginal increase in awareness regarding deworming as a result of initial project interventions; vii) pig mortality due to diseases; viii) live pigs are sold to local traders at door-step for immediate cash payments; ix) weighing is purely based on estimation and; x) the presence of extension services at present is negligible.

5.5 Value Chain Mapping at Production Clusters
Fig 42: Value Chain Mapping at Production Clusters

Fig 42 represents the pig value chain at farmers' level in the production clusters of the study. It has been divided into two parts. The first part maps the different channels of procuring the piglets. A farmer may get piglets at his/her own household if he/she is involved in breeding practices. Second, a farmer may procure/buy piglets from another farmer within or outside the village. Third, two farmers, one with a sow and one with a boar, share piglets among themselves for fattening. The different value chains at post-production level, which comprises of trading of live animal and selling/consumption of pork have been depicted in fig. 43.

![Value Chain Diagram]

Fig 43: Individual value chains - post-production level

As can be observed in fig 43, the pig value chains are found to be very small at production clusters consisting of only one or two actors. There is an absence of any middle men/aggregators or traders of live pig. It is largely due to limited supply of live pigs as against the given demand for pork in the region.

In Value Chain 1, the farmer sells live pig to fellow villagers. The animal is then consumed within village or at some occasion like wedding or festival. In Value Chain 2, farmer slaughters the pig and pork is consumed at household level or within the village. In Value Chain 3, the farmer slaughters the pig and sells the pork in weekly rural markets. In Value Chain 4, farmer sells the live animal to butchers, who then sell the pork in the rural market, either in the village or in a nearby town.

5.6 Farmers’ Cost-Benefit Analysis

Table 9 presents an analysis of the farmers’ cost-benefit analysis in the two blocks based on the data collected through individual farmers’ survey.
### Table 9 Farmers’ Cost-Benefit Analysis of pig production (INR)

<table>
<thead>
<tr>
<th>Components</th>
<th>Jhinkpani</th>
<th>Simdega</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Desi Breed</td>
<td>Improved Breed</td>
</tr>
<tr>
<td>Buying of piglet</td>
<td>2700</td>
<td>0</td>
</tr>
<tr>
<td>Making of shed</td>
<td>0-500</td>
<td>500</td>
</tr>
<tr>
<td>Feed**</td>
<td>1800- 3600 (6 months-one year)</td>
<td>7200 (two years)</td>
</tr>
<tr>
<td>Medicine</td>
<td>225</td>
<td>300</td>
</tr>
<tr>
<td>Castration cost</td>
<td>100</td>
<td>No cost</td>
</tr>
<tr>
<td>Total Cost of production</td>
<td>4825-7125</td>
<td>8000</td>
</tr>
<tr>
<td>Selling Price (for 50 kg of pig)</td>
<td>Live Pig for 5000-7500</td>
<td>Live Pig for 7250***</td>
</tr>
<tr>
<td></td>
<td>Pork for 7250-8750***</td>
<td>Pork for 6850</td>
</tr>
<tr>
<td>Transportation to market place in case of selling of slaughtered pig</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Total loss/benefit</td>
<td>Loss up to 2125- benefit up to 3925</td>
<td>Loss up to 750- 1150</td>
</tr>
</tbody>
</table>

Notes: *Only if buy- improved breed- they will sell it in one year
**purchase of rice husk for 6 months- 2 kg/day/pig @INR. 5/kg = INR 1800
***@INR 100/kg- @150/kg for live pig; @160/kg - @200/kg of meat weight + @100/kg for rest of the part- 150
****@INR 145/kg on an average for live pig; @ 150/kg of pork + @100/kg for rest of the part- 150

In Jhinkpani, the average amount spent on procuring a piglet was estimated to be INR 2700. Sheds are maintained by a small percentage of farmers and the existing ones are with mud floors. Thus, the range has been kept between INR 0-500. Feed is the major component of cost of pig production. Rice husk being the main component that bears cost; feed cost has been calculated based on its price. For six months, it would be INR 1800 (2kg/day/pig @INR 5/kg for 180 days) and accordingly for one year, it would be INR 3600. The average cost for medicine is INR 225. The cost of castration is INR 100. The minimum cost of production has been calculated by summing up- the average cost of piglet, zero cost of shed, cost of feed for six months, average medicine cost and average castration cost. The total comes out to be INR 4825. The maximum cost of production includes cost of piglet, cost of shed, cost of feed for one year, average cost of medicine and the cost of castration. It sums up to INR 7125.

Coming to the estimation of the selling price, sale can be either of a slaughtered pig or a live pig. For live pig, as mentioned earlier in the report, the price falls in the range of INR 100-150/kg of live weight. Accordingly, for a 50 kg of pig, the minimum selling price would be INR 5000 and the maximum selling price would be INR 7500. In case of slaughtered pig, 80% has been considered as the dressing percentage of pig for which, the price falls in the range of INR 160-200/kg. The rest 20% is considered
to be sold @INR 100/kg as nothing is wasted of the pig being sold during marketing. Accordingly, the minimum selling price for a 50 kg of live pig after slaughtering comes out to be 6250 (160*40) + 1000 (100*10) – 150 (cost of auto) = INR 7250. Similarly, the maximum selling price would be 7850 (200*40) + 1000 (100*10) – 150 (cost of auto) = INR 8750. The margin of the farmers has been calculated through subtracting maximum cost from minimum selling price for lower limit and; minimum cost from maximum selling price for the upper limit. It comprises both, trading of slaughtered pig and live pig. Thus, a farmer may incur loss up to INR 2125 (5000-7125) and profit up to INR 3925 (8750-4825).

In Simdega, majority of the farmers are involved in breeding practices and thus do not incur cost on purchasing piglets. However, a small percentage of the farmers has gone for improved breeds and purchased piglets at an average cost of INR 2000. Sheds are maintained by a majority of these farmers and thus the cost has been kept at INR 500. The cost of feed is the major expense. In case of desi breed, farmers are keeping it on an average for two years. Thus the cost of feed (considering rice husk as the main component being purchased) for two years would be INR 7200 (2 kg/day/pig @INR 5/kg for 720 days). In case of improved breeds, farmers sell it in less than a year. Thus the cost of feed would be INR 2400 for eight months. The average medicine cost came out to be INR 300 for desi breed only as the improved breeds are not kept for long. Castration is done by some local cognizant person in the village to whom, farmers need not necessarily pay. They just provide them with a meal. Thus, the total cost of rearing desi breed includes zero cost of procuring piglet, cost of shed, feed cost of two years, average medicine cost and zero cost of castration. It sums up to INR 8000. In case of rearing improved breeds, the included components are cost of procuring piglets, cost of shed, feed cost for eight months, and zero cost of medicine and castration. It sums up to INR 4900.

With respect to marketing, the average selling price for live pigs came out to be INR 145/kg of live weight especially in case of desi breeds where pigs are kept for longer duration. The average price of meat came out to be INR 150/kg. Thus, the average selling price for a 50kg live pig came out to be INR 7250. For slaughtered pig, @145/kg multiplied with 80% of 50 kg of live weight, i.e. 40 kg plus selling price of the rest 20% @INR 100/kg; it comes out to be INR 7000. In case of rearing of desi breed, the margin are only showing losses within the range of INR 750 to INR 1150. In case of improved breed, farmers are better off if they keep their pigs for about eight months. The profit falls in the range of INR 1950 to INR 2350.

Rearing pigs for over the period of two years with substantial time and monetary investment, only to incur losses is not essentially a rational economic activity. Lack of awareness, the need based nature of the pig production and a poor understanding of the economics of pig rearing turns this potentially profit making enterprise into an inconspicuous loss making activity for the farmers.
6. MARKET ASSESSMENT

In order to analyze the situation on the marketing front, 10 pork markets have been covered under the study. It includes the four main consumption centers in the state, viz., Ranchi, Bokaro, Dhanbad and East Singhbhum. The rural markets at the production clusters also form a part of the analyses. Table 10 enlists the name of the markets covered across six districts. The discussion and market assessment has been divided broadly under three sections. First, structure and profile of the markets, both the regular and weekly markets. Second, mapping of the pig value chain at consumption centers and third, the cost-benefit analysis for a butcher.

Table 10 Markets covered under the Study

<table>
<thead>
<tr>
<th>Districts</th>
<th>Markets Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranchi</td>
<td>Satranji Bazaar</td>
</tr>
<tr>
<td></td>
<td>Shalimar Bagh Market</td>
</tr>
<tr>
<td>Bokaro</td>
<td>Dhundi Market</td>
</tr>
<tr>
<td></td>
<td>Badkama Market</td>
</tr>
<tr>
<td>Dhanbad</td>
<td>Karkend Bazaar, Katras</td>
</tr>
<tr>
<td></td>
<td>Bhorwa Bazaar</td>
</tr>
<tr>
<td>East Singhbhum</td>
<td>Balle Complex - Jamshedpur</td>
</tr>
<tr>
<td>West Singhbhum</td>
<td>Haat Gamariya</td>
</tr>
<tr>
<td></td>
<td>Bazaar at Jhinkpani, Jodaphokhar</td>
</tr>
<tr>
<td>Simdega</td>
<td>Chota Bazaar</td>
</tr>
</tbody>
</table>

6.1 Structure of Pork Markets

Table 11 provides an overview of the structure of regular pork markets and Table 12 presents the brief of weekly markets. The following discussion mentions in detail the profile of each of the 10 markets covered. It starts with the markets in consumption centers followed by the markets in production clusters.

Profile of markets at Consumption Centers

Bhorwa Market in Dhanbad District was located at the outskirts of main city near railway crossing. There are about 30-35 retail meat shops within the radius of 5 km. Amongst them, two are wholesale shops and the main source of supply for the retail meat shops in the vicinity.
## Table 11 Structure of Regular pork markets

<table>
<thead>
<tr>
<th>Name of the market</th>
<th>Est. No. of butchers/sellers in the vicinity</th>
<th>Price of meat (INR/kg)</th>
<th>Location</th>
<th>Other Specifics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bhorwa Bazaar in Dhanbad</td>
<td>30-35 meat shops within 5 km of radius</td>
<td>130-140</td>
<td>At the outskirts of the city near the railway crossing</td>
<td>Two of them - wholesalers of pork meat and supply to all shops with in the radius of 5-7 km</td>
</tr>
<tr>
<td>Karkend Bazaar in Katras, Dhanbad</td>
<td>5-6 butchers</td>
<td>150-200</td>
<td>In main market of Katras, but located a little separately than the other shops</td>
<td>Variation in prices as per seasons; lower in summers; higher in winters &amp; monsoon</td>
</tr>
<tr>
<td>Badkama market in Bokaro</td>
<td>A retail meat shop</td>
<td>180</td>
<td>In the peripheries of the main city</td>
<td>Gets its supply from Bhorwa wholesale market in Dhanbad Customers were consuming the cooked meat on the spot.</td>
</tr>
<tr>
<td>Balle Complex at Jamshedpur</td>
<td>Only one famous pork shop</td>
<td>160</td>
<td>On the main road in the middle of the city</td>
<td>Supply of live pigs is through private farms within Jamshedpur.</td>
</tr>
</tbody>
</table>

Note- All of these butchers are involved in the business for generations

## Table 12 Structure of Weekly Pork Markets

<table>
<thead>
<tr>
<th>Name of the market</th>
<th>Est. No. of butchers in the market</th>
<th>Days of Operation</th>
<th>Price of meat (INR/kg)</th>
<th>Supply of live pigs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satranji Bazaar in Ranchi</td>
<td>4 shops owned by brothers</td>
<td>Wednesday, Saturday</td>
<td>200</td>
<td>From villages within the Ranchi District in the range of 50-60 km</td>
</tr>
<tr>
<td>Shalimar Bazaar in Ranchi</td>
<td>12 pig butcher shops</td>
<td>Tuesday, Friday</td>
<td>180</td>
<td>From the villages in the interiors of Ranchi within the range of 40-50 km</td>
</tr>
<tr>
<td>Dhundi Market in Bokaro</td>
<td>4-5 butchers</td>
<td>Thrice a week</td>
<td>120-140</td>
<td>From nearby local areas Also go to Bengal, Purlia (40 kms) at times of scarcity (the biggest market in Bokaro for pork)</td>
</tr>
<tr>
<td>Haat Gamariya (about 17 kms from Jhinkpani)</td>
<td>3-4 butchers</td>
<td>Monday</td>
<td>200</td>
<td>Some butchers here are farmers as well-get the live pigs from their own village called Chillipatta village – 2-3 km Others are getting it from villages at Odisha Border as well</td>
</tr>
<tr>
<td>Jodapokhar in Jhinkapani</td>
<td>7-8 butchers</td>
<td>Saturday</td>
<td>160</td>
<td>Form nearby villages</td>
</tr>
<tr>
<td>Simdega Bazaar</td>
<td>3-4 butchers</td>
<td>Monday</td>
<td>160</td>
<td>Form nearby villages</td>
</tr>
</tbody>
</table>
Amongst the nearby regions, the major sources of supply for the wholesale shops are Jamshedpur and Odisha. The farmers/farm owners contact them over phone call whenever they are ready to sell the animal. Besides, the butchers in the market have access to distant markets as well, which include different districts of Uttar Pradesh like Kanpur, Banda, Fatehpur, etc. and Nagpur in Maharashtra. Unlike Jharkhand, mandis are organized in these locations. Contact are maintained with suppliers who deliver animals to these shops from these mandis. The mode of transportation is truck. Roughly, 150-200 pigs of about 40-50 kg are supplied at once which gets distributed within the market to individual butchers according to their capacity. The price estimations are also communicated over phone calls. The lowest-price option is selected. On an average, a pig weighing 50 kg would cost around INR 5000 plus INR 500 of transportation charges.

The butchers do not prefer to opt for exotic breeds, especially in case of distant locations as they may not survive during transportation. The main reason is their large size and weight, which can go up to 1-2 quintals. They can safely be transported through train but not truck. Additionally, it is not possible for a butcher to sell out the whole of 100-150 kg of meat in a day, especially in summer season. Thus, the butchers prefer to get pigs weighing up to 70 kg. The demand rises in winters when the daily sales of wholesale shops go up to 100-150 kg. The price of pork in wholesale shops is INR 140/kg as against INR 200/kg in retail meat shops. Some butchers in the market are also involved in primary processing. Sausages are made using traditional methods. The large intestine is filled up with a ground mixture of blood, stomach, leftover pieces of meat, liver, etc mixed with onion, garlic and other spices. These sausages are sold at the same price as that of meat.

The butchers in the market have experienced decrease in demand for pork in this region as compared to the time of their grandfather 20-25 years back. The reasons cited were decrease in individuals' income and unemployment due to closure of mining operations in the region. It has also led to migration of workers to other destinations. Social stigma related to pork consumption was also mentioned as one of the major reason behind limited demand of pork. STs and OBCs were mentioned to be the major buyers of pork in the region. In regard to retail prices of meat, they have got doubled from INR 100/kg to INR 200/kg over the period of last five years.

**Karkend Bazaar in Katras, Dhanbad** is a cluster of about 5-6 pig butcher shops. Katras is a peripheral area of Dhanbad city. No pig butcher shop could be found in the main city. Karkend is a famous market area of Katras. However, the cluster of pig shops was located in the interiors; away from other shops. These shops are there since the time of British Raj and has been the main source of livelihood for the butchers. They are open seven days a week from 11 in the morning till 8:30 in the evening. They are closed on the days of festivals, etc. in order to comply with general social customs.

The primary source of live pigs for these shops is Jamshedpur and Odisha. Earlier, traders (Vyapari) used to come from Allahabad, Fatehpur and Kanpur; but now, the procurement is made directly from farmers in Odisha and Jamshedpur. Every 15-20 days, the butchers go out to locate live pigs from
individual farmers and aggregate about 60-70 pigs in two to three days. Butchers only identify the suppliers/farmers and finalize the deal; a transporter is hired to supply the pigs to their shops. Extensive negotiation happens at the time of procurement of pigs from farmers. According to butchers, most of the time, it is their compulsion to buy the animal as a farmer has large number of alternative buyers. However, scarcity of pigs is faced mainly during winters, when butchers have to pay higher price for pigs.

Among consumers there is no preference on basis of breed or color. It is only on part of the butcher that desi is preferred in summer owing to its low weight and small size. In winters, butchers may prefer to go for exotic breeds “(farm wala)” weighing up to 1-2 quintal given the high demand for pork. The price of meat is INR 200/kg. These butchers also make sausages using traditional methods. However, the size of the intestine was visibly very large as compared to what was there in Bhorwa market.

For about 50 kg of live pig, the butchers pay about INR 4000. The transportation cost was estimated to be around INR 700. At times, the vehicles are stopped by police and transporters need to pay them some amount as bribe. For slaughtering of pigs and making of sausages, all of these shops hire labor. The estimated labor cost per pig is around INR 150. Coal is used to burn the hair. The leftover meat of the day is stored in deep freeze to be sold the very next morning.

**Badkama** is a place at the outskirts of main Bokaro city. It is a habitation of SC/ST community. A retail meat shop was situated in the area. The retailer purchases meat on a daily basis from the wholesaler in Bhorwa, Dhanbad @ INR 130/kg. It is at the distance of about 15 km from this place. According to the butcher in Bhorwa, this is the farthest retail meat shop to which they supply. The selling price of meat in Badkama is INR 180/kg. The consumer base is local, mostly from Barwi ST community. Most of the consumers get the meat cooked at the shop only and consume it along with locally prepared alcohol. A very few percentage of them takes it to home.

**Balle Complex, Jamshedpur** is the only regular meat shop which was found to be situated on main road in the midst of the city. The shop has been there for generations. The supply of live pigs is from private commercial farms and individual farmers. Most of it is from Jamshedpur only as the prices are low as compared to outside. The price for live weight is around INR 100/kg as against the meat price of INR 160/kg. The minimum dressing percentage of a 100 kg live pig would be around 70%.

With respect to breed, they generally procure the black and black & white colored pig. Though the pink one is also available, it is less preferred by the consumers. The demand is maximum for black one. According to butcher however, pink breed is good in quality. It was mentioned that if a pig is kept for too long, it tends to gain more fat, which is not preferred. The appropriate age to slaughter a pig is around 8-10 months. With the right amount and right composition of feed, a pig attains its maximum weight by this age. The variations in weight, size and height largely depends on breed irrespective of
feeding and medication. If a pig is fed more than required, it will only translate in to increased fat and not meat weight.

All sizes of pigs are procured with pricing solely based on weight estimations. A butcher would be in loss if pigs are sold based on scientific measurement as the weight would then include the actual live weight and all of what a pig has consumed. The butchers need to procure pigs from the doorstep of the farmer/farm owner. It is their responsibility to arrange labor and transportation. Their hired labor go for collection of live pigs. The farmers/ farm owners maintain contacts of butchers to be able to inform them whenever they are ready to sell their pigs. The butchers also go to Odisha for procuring pigs. Labor is paid on a daily basis as their days of working are not fixed. Diseases in pigs are checked for before purchasing. To anticipate the presence of cysts in meat, butchers at times also mark a slight cut in the external flesh, if no signs are visible like under the tongue. If they find anything as such, they do not purchase it. If meat is found with cysts on slaughtering, it is a complete loss as it cannot be sold.

The slaughtered pigs are dressed after removing hair with a blade. If the skin is burnt, it will remove the hair but the roots will remain just as in the case of shaving. The head and intestine are sold separately. They do not sell sausages as they find it expensive to make, which would cost INR 300/kg. These are made only if ordered. Their customer base is mostly the regular consumers and hotel supply. The overall sales goes down in summers to 30-50 kg per day as against 100-150 kg in winters. The demand is maximum during Christmas. According to the butchers, the demand has declined over the years. They do not face scarcity of live pigs as there are about four to five farms in Jamshedpur itself plus they get supply from individual ST farmers from villages.

**Satranji Bazaar in Ranchi.** is a weekly market located at a distance of about 19 km from the Ranchi railway station. It is set up twice a week, on Wednesdays and Saturdays. The market has a wide range of shops including vegetables, spices, clothes, etc. along with meat shops for goat, pig, chicken and fish. For pork, there are about 4-5 shops and these butchers are brothers. They belong to the SC community and the business is their main source of livelihood. They also sit in other weekly markets of Ranchi, namely, Shalimar on Tuesday and Friday and; Namkum on Thursday and Saturday. Monday is taken as off. These markets start at around 10-11 in the morning and go up till 7-8 in the evening.

The live pigs are procured from villages within Ranchi district in the range of 40-60 km. Some of the villages mentioned by the butchers were Khunti, Bundu, Gangahat, etc. The butcher has hired 10-12 laborers responsible to locate pigs and inform to the butcher. The labor again visits the farmer, this time with cash in hand to make the payments and procure the pig. The cost of labor per pig was assessed to be around INR 300. The butcher maintains his own small farm as well where he keeps about 15-20 pigs to ensure regular supply. He has his own small sized auto-pickup truck, which he uses to transport pigs from farmers to his home and then to market. Weight measurement is solely based on estimation. A pig with meat weight of about 30 kg is purchased for INR 3000-3500.
A butcher slaughters two to three pigs each time a market is set up depending on demand. The pigs weigh around 30-80 kg. T & D breed is most accepted amongst butchers in the region as it attains weight quickly. The pigs are slaughtered in the open, their skin is roasted with fire to remove the layer of hair. This adds to the cost in the form of gas cylinders. The dressing percentage comes to be around 70%. It includes skin, fat and meat. Blood is collected during slaughtering. It is of thick consistency. It is deep fried with onions, garlic, salt and chilli and sold as blood *pakoras*. The intestine and other body parts are sold separately @INR 80-100/kg. The leftover meat is stored and sold the next day. For buyers, the preference is for freshly slaughtered and tender meat. They are indifferent to gender of pigs. In terms of color, black is preferred and age of pig is inversely proportional to tenderness. There are about three to four laborers in a butcher shop to carry out tasks like slaughter, cleaning, weighing, chopping, etc.

Around these butcher shops, there are about 10-15 small makeshift dhabas each having two to three gas stoves, some utensils with sitting space for about 10-20 people. About 10% of the pork buyers get it cooked in these dhabas and consume it there only with locally available alcohol. It is a common practice in these markets. In the absence of rural haats, procurement of live pigs becomes a challenge for these butchers. The butchers want to increase their farm size but given the inadequacy of capital, they are unable to maintain a larger herd size.

**Shalimar Bagh bazaar, Ranchi** is a weekly market located about 20 km from the Ranchi railway station. It spreads out over a larger area than Satranji Bazaar. There are about 12 pig butchers in the market with varying degree of scale of operation. The procurement of live pigs is from nearby villages within the range of 40-50 km in Ranchi only. The butchers operating at smaller scale go for the aggregation of pigs twice a week during the off-days. Procuring pigs from interior locations becomes expensive as transportation becomes a challenge. Butchers do not prefer to procure pigs from veterinary college of Ranchi as they sell female pigs of three to four years old, which to butchers is equivalent to rejected stock. They procure pigs weighing from 30-40 kg to even up to 150-200 kg depending on the breed. The pig of around 100 kg is bought for INR 11,000-12,000.
Pig Value Chain Study in Jharkhand

The larger the pig is, the more is the fat content, which is not preferred by the consumers. In case of more fat content, butchers separate fat from the meat at times. This separated fat is sold cheaper. The remaining layers of fat and meat are sold at usual meat price only. Slaughtering process is similar to as that of Satranji Bazaar. However, blood is collected by some of the butchers only in the market, while the rest drain it. Further, about 75% of the customers buy pork and get it cooked in the surrounding makeshifts dhabas. This chain of consumption is unique for pork. It is like their weekly lunch. The customer base is largely from the lower income group.

According to the butchers in the market, there are only weekly markets for pork. A regular meat shop would not work in case of pork as customers generally prefer to get it cooked and consumed. They also feel that even if they want to set up a regular shop in the city, they will not be allowed to do so.

**Dhundi market, Bokaro** is located in Sector 12, urban city, Bokaro. It is considered to be the biggest market for pork in Bokaro city. Though the set up for these shops is permanent, they are open thrice in a week. The procurement of live pigs is from nearby villages from individual farmers. During seasons of high demand, they even go to Purulia in West Bengal (about 40 km). A middleman is involved in the chain only to transmit information regarding the availability of pigs at source. He charges about INR 100-200/pig. The butcher is then liable to go and collect the pig at his own cost. Even if the butcher fails to procure the pig due to any reason, the charges for middleman are fixed. The weight of the procured pig is between 20-100 kg depending on availability and demand. Price of live pig rate @INR 100-110/kg. The cost of transportation comes to be around INR 300-400. The charges are more at times as every auto wala is not willing to transport pigs. Weighing is solely based on estimations.

The meat price is INR 140/kg. In case of bulk supply, it is even sold at INR 120/kg given the competition among butchers. The customer base is local and there is no supply to hotels. Consumers are indifferent to breed. The preference is only for good quality tender meat. Meat of a sow would be hard and thus not in demand. At times, customers ask for specific color but these butchers don’t entertain them as they sell everything mixed.

It was mentioned that there was a problem due to ban on open slaughter. It compelled them to slaughter pigs inconspicuously. They mentioned that it was only recently that they restarted slaughtering pigs in the open. The butcher also rears pig but not for slaughtering. He has kept a sow, which will be used for breeding and the piglets will be fattened to sell. He wants to keep a larger herd size, however, does not find it possible to afford feed. It is a huge challenge for the butchers to locate pigs from remote villages.
Profile of markets at Production Clusters

Haat Gamariya in West Singhbhum is a Monday weekly market located about 17 km from Jhinkpani. The market consists of about three to four butchers. Butchers come from different villages. In one of the shops, the butchers are pig farmers as well. They have been in this business for about 12-13 years. They come from a nearby village called Chilipatta; 2-3 km from this market. Live pigs are procured from within the village. According to them, every household in the village maintain a herd size of two to four pigs. These butchers/farmers do not go to the weekly market organized at Jhinkpani. They mentioned that everyone has their own demarcated area. They need to pay INR 200 every week to set up the market in the area. Another butcher in the same market gets his supply from the villages at Odisha border. He gets one pig each Monday of about 70-75 kg of weight.

On an average, the butchers get about 20-22 kg of meat from a pig of about six months old. Two pigs are taken to the market, one bigger and one smaller. They do not prefer to opt for improved breed either for rearing or slaughtering as according to them, it will turn into a giant. It would not be possible for them to sell off the meat in one day then. Storage of leftover meat is a challenge for them as there is erratic supply of electricity in their village. Problems may arise in case butchers do not have license. In this case, they need to pay INR 500-1000 to the authorities. It was mentioned that the travelling required in making the license is an issue.

Jodapokhar in Jhinkpni, is a Saturday weekly market. It comprises of seven to eight butchers from nearby villages including Asura. The meat rate in this market is INR 160/kg. Due to lower prices, the pig rearing households involved in commercial selling of slaughtered pigs in the study area preferred haat gamariya where meat price is INR 200/kg.

Chota Bazaar in Simdega is a Monday weekly market in Simdega town. It consists of three to four butchers. The same butchers set up their shops in Bada Bazaar of Simdega as well which is a Thursday weekly market in of the town. The procurement of pigs is from nearby villages. The rate of meat is INR 160/kg.

To summarize, the market structure for pork in the study districts is more inclined towards weekly markets. In case of regular pork markets, the location signifies the role of social factor. It was only in Jamshedpur that the butcher shop was located amidst the main city. The rest were located in isolation, at the peripheries of the main city. With respect to the procurement of live pigs, there is clear demarcation in patterns between the two structures of markets. The difference is also attributable to
the scale of operation. The butchers in weekly markets rely heavily on supply from villages within the range of 40-60 km. They need to allocate a day or so per week solely to the task. Besides time, it requires a lot of efforts in locating households willing to sell their pigs. Procurement becomes a major challenge during the peak season in winters. On the contrary, the butcher in regular markets need to ensure constant supply of pigs. Their main source of supply is private commercial farms in Jamshedpur and Odisha. Maximum supply is from Jamshedpur. Even in case of individual farmers, they maintain contacts. Farmers can contact them whenever they are ready to supply pigs. Some of the butchers like the one in Bhorwa market procure pigs from mandis of UP and Maharashtra. In the given case, a supplier is involved in the value chain. Based on the alternative channels present, figure 39 presents the different value chains at the consumption centers. Due to limited scale of production in Jharkhand, no rural haats or mandis are set up in the state. The weight and size of the pig procured depends on the availability of live animal and demand for pork.

Slaughtering is carried out within the shop premises in both the cases. The dressing percentage of meat is about 70-80% on an average. The selling price of meat falls in the range of INR 140-200/kg. The leftover part of pig is sold at about half of the rate to that of meat, if unprocessed. Value addition through traditional primary processing could be noticed in only two of the markets in Dhanbad. Sausages made of pig intestine are sold as the same rate to that of meat. In Ranchi markets, blood pakoras are made signifying different option for value addition. On-the-spot consumption of meat after getting it cooked in nearby make shift dhabas is a common phenomenon.

With respect to the consumer preferences, what matters most is the freshly slaughtered and good quality tender meat. Meat with more fat content is not preferred, which is usually there in case of heavier pigs. Consumers are indifferent to gender of the pigs. In terms of color, black is a general preference. Winters is the peak season of pork consumption.

6.2 Value Chain Mapping At Consumption Centers

The existing value chains for pigs are very small in the state. Butchers directly procure from farmers/farms. Value Chain 1 depicts the pattern in weekly markets where butchers procure live pigs from farmers in nearby villages. Value Chain 2 depicts the patterns in regular pork markets. To ensure regular supplies, these butchers procure pigs from commercial farms of Jamshedpur and Odisha. These butchers maintain direct contact with these farms. The deal is finalized personally or on the phone, the transporters are then hired to deliver the pigs to their shops. Only in case of distant source of markets, which is applicable to few cases, suppliers are involved.
6.3 Cost-Benefit Analysis for Butchers

Based on the cost estimates reported in different markets, table 13 presents the cost-benefit analysis of a butcher per pig of live weight 50kg. The components of total cost include cost of a live pig, transportation charges, equipment used in slaughtering, cumulative cost of labor involved at different levels, making of sausages through traditional methods and shop rent in case of rural markets. The lower limit for the range of total cost has been calculated taking the lower limit of range at all levels excluding the cost of making sausages. The upper limit of cost is the sum of upper limit of range at all levels.

The components of selling price include the selling price of meat (80% of the total live weight) which falls in the range of INR 140-200/kg and; the selling price of rest 20% @INR 100/kg approx., if all the organs are sold separately; @INR 200/kg approx., if these are sold in form of sausages. The range for the selling price has been calculated accordingly. The lower limit for the margin of profit has been calculated by subtracting the maximum cost from minimum selling price. Accordingly, the upper limit is the difference of minimum cost and maximum selling price. Approximately, the average margin recorded for butcher was estimated to be INR 2500. The resulting figures are indicative of the fact that a short value chain ensures larger scope for profit margins for a butcher.
### Table 13 Cost-Benefit Analysis of Butchers

<table>
<thead>
<tr>
<th>Steps</th>
<th>Cost at every step (INR/ 50 kg of live pig)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buying of live pigs*</td>
<td>5000- 5500</td>
</tr>
<tr>
<td>Transportation</td>
<td>200-300</td>
</tr>
<tr>
<td>Slaughtering of pig (gas cylinder, etc)</td>
<td>100</td>
</tr>
<tr>
<td>Labor (if involved, for collection of live pig/slaughtering )</td>
<td>200-300</td>
</tr>
<tr>
<td>Making of sausages (if doing)</td>
<td>100</td>
</tr>
<tr>
<td>Shop rent (for rural weekly markets)</td>
<td>100-200</td>
</tr>
<tr>
<td><strong>Total Cost</strong></td>
<td>5600- 6400</td>
</tr>
<tr>
<td>Selling of meat (80% of weight)**</td>
<td>5600- 8000</td>
</tr>
<tr>
<td>Selling of the rest of the part - 20%</td>
<td>1000- 2000</td>
</tr>
<tr>
<td>(Separately/Sausages)***</td>
<td></td>
</tr>
<tr>
<td><strong>Total Selling price</strong></td>
<td>6600-10,000</td>
</tr>
<tr>
<td><strong>Margin of a butcher per pig</strong></td>
<td>200- 4400 (approx. 2500)</td>
</tr>
</tbody>
</table>

Note- *cost of live pig @INR 100-110/kg; **selling price of meat (80% of weight, 40kg) @INR 140-200/kg; ***selling price of rest of the 20%, 10kg @INR 100/kg if sold separately and @INR 200/kg, if in the form of sausages
7. CHALLENGES ALONG THE VALUE CHAIN

7.1 Input Stage

1. Vaccination
Unavailability of required vaccination services in the state to prevent outbreak of endemics like swine fever is one of the major challenges in pig farming. Classical Swine Fever (CSF) pose continuous threat to pig production. It is potentially a highly contagious fatal viral disease that affects pigs of all ages. It has been rated fifth among the most important viral diseases of livestock prevalent in India by the Government of India. Factors like sudden onset, rapid transmission, generalized bleeding and high mortality signify the disease. The clinical symptoms include loss of appetite, high fever, vomiting/severe diarrhea, conjunctivitis, reddish or bluish discoloration at the extremities and convulsions/posterior paralysis. The outbreak is observed severe in piglets and crossbreds which leads to higher morbidity and mortality rates (Bett, et al. 2014).

2. Veterinary Service Provider
There is a negligible presence of adequate veterinary services in the production clusters of the study. A considerable percentage of farmers is either relying on traditional methods or local chemists shops for cure. Evident through the numbers, pig mortality is a widespread phenomenon. The situation is severe in remotely located villages. For instance, in Badabarpani, Simdega, farmers do not have access to veterinary services at all.

3. Credit Facilities
Farmers in Simdega reported that they face difficulties in buying piglets due to unavailability of cash in hand. It prevents them to go the rearing of improved breeds. The households in Simdega are involved in both breeding and fattening of pigs. Thus, procuring a piglet of desi breed is not an issue. However, in order to switch to improved breeds, farmers would need to procure piglets by making cash payments. In the absence of any formal credit facility, procurement becomes a challenge.

7.2 Production Stage

1. Adoption of improved breeds
In the production areas of the study, the pig rearing households with traditional mindset are uncertain of opting for improved breeds, largely due to lack of awareness. It has been argued that desi breeds are smaller in size, have lower growth rate and produce less number of litters. Rearing desi breeds thus restricts the households from realizing the full economical potential through pig farming.
2. Land
The issue is specific to the pig rearing households in Jhinkpani, where most of them are landless. Unavailability of land poses the issue of housing space for pigs, which restricts in upscaling their production activity. Lack of land also means that there is no residues from crops that can be used for feeding pigs. Unlike goats and other livestock animals, it is not possible to rear pigs within the housing premises. This animal stinks and thus require a separate housing space. It is possible to rear one or two pigs only for fattening purpose without housing space, but for breeding practices, proper housing is an utmost necessity.

3. Feeding Practices
The farmers in the production clusters are practicing both stall feeding and open scavenging to feed pigs. Pigs are natural scavengers. They tend to eat all kinds of waste products including garbage and even human waste. Thus, an uncontrolled open scavenging can downgrade the quality of pork, which makes it less acceptable amongst consumers.

4. Shortage of feed and water
Feed is the main component of cost incurred in pig rearing. Pig is considered to be a lazy animal which eats and grow. The daily requirement of a pig is about 4-5 kg of feed. Thus it becomes a challenge for households to provide pigs the feed in adequate amount, especially if they have to buy it from market. Scarcity of water in these areas is another major challenge for the pig farmers.

5. Health Care
The pig rearing households in the production clusters do not have any awareness related to vaccination requirement of pigs or good husbandry practices to be followed. This coupled with negligible presence of veterinary service in the villages, results into high mortality in pigs. In Simdega, this was as high as 2.82 pig per household on an average in last year. Even for Jhinkpani where farmers are mostly engaged in fattening practices, the average number of pigs died was estimated to be 0.80 per household during last year (Primary Survey).

7.3 Marketing at Producers’ Level
1. Profit margins are less than optimal level
The farmers in the production cluster are unaware of the right age and right selling price of their pigs. In Simdega, the households are keeping their desi breed pigs for 2-3 years. Even at the rate of INR 10/day, the feed cost alone outweighs the potential selling cost. Further, in the absence of any provision
for weighing live pigs, farmers tend to suffer losses. The farmers are yet to make economic sense out of pig rearing practices.

2. Access to markets
This issue specifically relates to remotely located villages in the production clusters. For instance, in case of village Bhanwarpani in Simdega block, roads are in dismal condition coupled with non-availability of transports. Markets are at the distance of 8-10 km to be travelled all the way by walk. The pig rearing households in these villages have traditionally been involved in intra-village trading of pigs, especially in case of slaughtered pigs. In case of live pigs as well, they do not maintain any contacts with traders, outside of their villages.

7.4 Butchers’ Level
The challenges at the butchers’ level have been listed out as follows:

- The supply of live pigs is not at par with the demand for pork. It becomes a major challenge especially during winters, the peak season for pork consumption.
- Due to limited production, no rural haats for live pigs are organized in the state. It compels butchers to locate pigs in the interiors of villages, which incurs huge cost in terms of the time taken for travel and efforts put in.
- Acquiring license for slaughtering has proved to be challenge for butchers in rural areas given the time and cost involved in the process.
- The occasional bans on open slaughtering pose major hurdles for butchers.
- There is an absence of any organized slaughtering in the state. It is carried out in open, which poses the question of hygiene.
- Storage facility for leftover meat of the day becomes a challenge for butchers, especially in production areas given the irregular supply of electricity.

7.5 Processing of Pork
There is an absence of any processing of pork in the state. Currently, all of the packaged product like ‘Ready to Eat’ is being imported from Assam/Bengal. It creates the potential of pork sector in the state as there is high demand for processed pork products amongst high-end retail customers in India. Currently, we are importing huge quantities of processed pork products at the country level. Thus, it opens up the avenues for the state to enter into the sector.
8. POTENTIAL AREAS FOR INTERVENTION

8.1 Breed Improvement

After years of scientific research, the veterinary college of Ranchi developed ‘Jharsukh’ breed of pigs (earlier known as T & D, a crossbred of Tamworth and Desi), to augment the piggery production. The characteristics of Jharsukh breed that make it more economical than desi breed and acceptable among local populace of the state are as follow-

- Black Color and lustrous skin
- Faster Growth– at the age of one year, it attains about 90 kg of weight against 40 kg in case of desi breed
- Ability to utilize agricultural bio products and waste materials
- Better feed conversion efficiency – feed requirement of Jharsukh is 1.5 times lesser than the desi breed.
- Better reproductive performances– farrowing interval of Jharsukh is 190 days @8-12 piglets at once against 220 days of farrowing interval @3-8 piglets in case of desi breed
- Ecological adaptability and Disease resistance– Jharsukh is adaptable to local environmental conditions and less susceptible to diseases
- High survival rate– mortality rate for Jharsukh at the age of two to three months is five against 10 in case of desi breed
- Higher economic return

In consideration to the mentioned factors, Jharsukh is five to six times more economical than the desi breed. It has been a very successful research with respect to commercial pig production. The JSLPS project interventions have been directed towards promulgating the breed through breeder villages. However, as planned there will be a need for F1 pigs after a span of six years. Thus, it is recommended that every generation of desi pig is bred with F1 to maintain the characteristics throughout. To make the activity efficient, the F1 boar should be rotated within the villages to prevent the probabilities of inbreeding. In case one village is chosen as a breeder village, rotation can be promoted within the households (KII).

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8.2 Input Stage

1. Veterinary Service Provider

The provision of veterinary services is the utmost necessity considering the present scenario in the targeted production clusters. Community Livestock Service Providers hold the way out of the situation. The responsibilities would include vaccination, deworming, first aid and extension activities. Adequate training is prerequisite in this direction. Further, they will be in constant touch and guidance of government veterinarians enabling them to provide referral services to pig farmers.

2. Vaccination Services

It is crucial to facilitate the required vaccines for Classical Swine Fever (CSF) in the state. There have been interventions in North East for the same by the International Livestock Research Institute (ILRI). An epidemiological study was conducted in Assam, Nagaland and Mizoram in 2011, which delineated that pig farmers incurred huge losses i.e. over 2 billion each year due to treatment, mortality and replacement costs carried through CSF. It was also quoted that all India requirement of CSF vaccine is 22.26 million doses per year as against the availability of 1.2 million\(^8\). It has been reported that the vaccines were being produced by the Ranchi biological lab but were closed about 6-7 months ago, however it was of poor quality. Earlier the vaccinations were arranged form Kolkata, but due to scarcity at national level, it is now difficult to procure from there as well (KII). The production of vaccine in the state may be promoted through public-private integrated contribution.

Secondly, another vaccine given to pigs is for Foot and Mouth Disease (FMD), which is easily available on medical stores. It may be promoted through project interventions on immediate basis parallel to deworming drive.

Thirdly, the preliminary findings indicate the prevalence of porcine cysticercosis in the study areas, which has zoonotic connotations. Consumption of pork affected with the disease can cause epilepsy through neuro cysticercoses in humans. Thus, during project interventions, it is proposed that field staff should be more vigilant of the symptoms on ground. If found in severity, measures should be taken to prevent the same through vaccines. The vaccines are readily available with Indian Immunological Limited (KII). A study on incidence of cysticercoses in pigs should also be considered as it huge implications on human health by way of manifesting as neuro cysticercoses and epilepsy.

3. Availability of formal Credit

Availability of formal credit is an important factor in augmenting pig production in the production clusters of the study. First, it would enable the pig rearing households to opt for improved breeds.

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\(^{8}\) Bett, et al. 2014
Second, they would be able to make investments in making appropriate concrete structure for housing of pigs and; for purchase of required feed.

8.3 Feeding Management

The following points are to be taken in to consideration while planning for feed composition for pigs—

- Selection of economical locally available ingredients
- Basic ingredients should comprise of grains- maize, sorghum, oat, other millets, wheat and/or rice
- Protein supplements- oil cakes, fishmeal and meat meal.
- Vitamin supplements are not necessary if pigs are pasturing or fed with fresh green legumes; vitamin B12 is required if there is little or no animal protein in the feed
- Mineral mixture should be added to the diet

<table>
<thead>
<tr>
<th>Table 14 Specific feed requirements for pigs in different age groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrients</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>Protein supplement (%)</td>
</tr>
<tr>
<td>Oilcakes</td>
</tr>
<tr>
<td>Animal protein</td>
</tr>
<tr>
<td>Grains (Maize, sorghum, millets or combination of grains) (%)</td>
</tr>
<tr>
<td>Wheat bran or rice bran (%)</td>
</tr>
<tr>
<td>Lucerne meal (%) if available</td>
</tr>
<tr>
<td>Mineral mixture (%)</td>
</tr>
<tr>
<td>Antibiotic supplement (mg)</td>
</tr>
</tbody>
</table>

Source: [http://vikaspedia.in/agriculture/livestock/pig-farming-1/piggery](http://vikaspedia.in/agriculture/livestock/pig-farming-1/piggery), accessed on July 4, 2018

All grains are to be mixed to prepare the feed. Slop/dry feeding is generally considered superior to feeding in the form of wet mash. It however requires more time and excessive labor. If the given ration is fairly high in fiber, pelleting the feed may improve the rate and efficiency of gain in weight. It may also decrease the amount of feed wasted. Pellet feed needs investment in pellet making machine and could be supported by the project where in community animal health worker at cluster level takes it up as a supplementary livelihood activity. Overfeeding a sow which has been bred is to be avoided. Overfat sows tend to produce weak piglets and increases the risk of crushing during farrowing. The apt weight gain for a sow is 35 kg and for a gilt is 55kg from breeding to farrowing<sup>10</sup>.

<sup>9</sup> Weaning - Separation of young piglets from mother sow at eight weeks of age

<sup>10</sup> [http://vikaspedia.in/agriculture/livestock/pig-farming-1/piggery](http://vikaspedia.in/agriculture/livestock/pig-farming-1/piggery)
Table 15 Composition of concentrate feed for pigs in different age groups

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Creep feed (14th to 56th day)</th>
<th>Grower ration (up to 40 kg)</th>
<th>Finisher ration (40-90 kg)</th>
<th>Pregnant and nursing sows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize or sorghum or broken wheat, broken rice and barley in convenient combinations</td>
<td>65</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Oil cakes (groundnut oil cake, soya bean oilcake, sesame oil cake, linseed oilcake)</td>
<td>14</td>
<td>18</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Molasses</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Wheat bran or rice bran</td>
<td>10</td>
<td>1.5</td>
<td>25</td>
<td>18</td>
</tr>
<tr>
<td>Fishmeal or meat meal or cooked offal, skim milk powder dairy wastes</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Mineral mixture</td>
<td>1</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Salt</td>
<td>--</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Source: [http://vikaspedia.in/agriculture/livestock/pig-farming-1/piggery](http://vikaspedia.in/agriculture/livestock/pig-farming-1/piggery), accessed on July 4, 2018

Table 16 Approximate amount of dry feed as per weight

<table>
<thead>
<tr>
<th>Weight of pig (kg)</th>
<th>Daily consumption of feed (kg) per pig</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>2.0</td>
</tr>
<tr>
<td>50</td>
<td>3.2</td>
</tr>
<tr>
<td>100</td>
<td>5.3</td>
</tr>
<tr>
<td>150</td>
<td>6.8</td>
</tr>
<tr>
<td>200</td>
<td>7.5</td>
</tr>
<tr>
<td>250</td>
<td>8.3</td>
</tr>
</tbody>
</table>

Source: [http://vikaspedia.in/agriculture/livestock/pig-farming-1/piggery](http://vikaspedia.in/agriculture/livestock/pig-farming-1/piggery), accessed on July 4, 2018

It is important to note that as per KIIIs, relying completely on concentrate feed is not at all an economical option for piggery production. It is to be complemented with edible hotel waste, which is rich in proteins and different vitamins. Hotel waste, if available should be fetched on a daily basis to avoid consumption of rotten food. In a rural setting, vegetable waste can be given to pigs, the share of which should not exceed 25-30% of the total feed. It is rich in fiber and it is hard for pigs to digest excess fiber content. Similarly, wheat bran can be a feed supplement, 10% of the feed in case of a kid and 20-25% in case of an adult pig. Green grass present in abundance during monsoon is a good source of vitamins and minerals for pigs. It has been argued that since feed cost comprises of about 75-80% of the total cost of pig rearing, it is important to judiciously opt for the composition of feed.

8.4 Housing management

Pigs can be raised in enclosure for their entire lifetime. The practice can help in preventing them from endemics, control parasites, uncontrolled open scavenging and mating. There have been instances in study areas where pigs are poisoned by neighbors for destroying their fields. Keeping pigs in enclosure can help in avoiding these circumstances. Considering the factors, appropriate housing management is an important aspect of pig rearing. Majority of the existing sheds in the production cluster are made up
of mud. These have to be re-floored within the span of 6-12 months as the floor is often damaged by the animal. It is thus recommended to maintain concrete floor sheds for pigs along with open area (KII). Table 17 provides the estimates on normal requirement of floor area, water and air space in pens for various classes of pigs.

Table 17 Requirement of floor area, water & air space in pens for various classes of pigs

<table>
<thead>
<tr>
<th>Class of animals</th>
<th>Covered floor area per animal (m²)</th>
<th>Open-yard area per animal (m²)</th>
<th>Water required (litres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boar</td>
<td>6.25-7.5</td>
<td>8.8-12.0</td>
<td>45.5</td>
</tr>
<tr>
<td>Farrowing</td>
<td>7.5-9.0</td>
<td>8.8-12.0</td>
<td>18-22</td>
</tr>
<tr>
<td>Weaner</td>
<td>0.96-1.8</td>
<td>8.8-12.0</td>
<td>3.5-4</td>
</tr>
<tr>
<td>Dry sow</td>
<td>1.8-2.7</td>
<td>1.4-1.8</td>
<td>4.5-5</td>
</tr>
</tbody>
</table>

Source: [http://vikaspedia.in/agriculture/livestock/pig-farming-1/piggery](http://vikaspedia.in/agriculture/livestock/pig-farming-1/piggery), accessed on July 4, 2018

The flooring of pens should have a rough finish and be of regular masonry type made up of water proof cement mortar. Proper drainage system is required to get the effluents disposed of. For the purpose of farrowing, separate pen is required having guard rails along the walls to be used as creep space. Further, the mature breeding and fattening animals require wallows in areas with warm weather. Thus, it is desirable to make provisions for masonry wallows\textsuperscript{11} with proper drainage. The size of wallow would depend on the number and size of the animals.

8.5 Extension Services

It is essential first to make farmers aware of the gaps and interventions required in the production practices for effective implementation of the project activities. It includes all aspects related to pig production, such as:

- Importance and benefit of adopting available improved breeds
- Vaccination requirement of pigs and general health care
- Importance of stall feeding/ controlled scavenging in maintaining good growth, quality pork and in ensuring adequate nutrition to pigs.
- Importance of appropriate housing management

\textsuperscript{11} Wallow – water pool for pigs
Marketing Extension: It is important to develop a sense among farmers to understand the economics of pig rearing. As noticed, farmers are not realizing the optimal level of margins on sale of pigs. It is thus important to make them aware of the right age of marketing their pigs. They can be organized into a Farmer Producer Organization (FPO) and linked to local butchers to avoid distress sale and to strengthen them financially. A commercial aspect associated with piggery production is yet to take shape amongst the traditional pig rearing households.

Extension services and training at butchers’ Level: It is important that butchers are informed and trained in various aspects associated with slaughtering of pigs to ensure the quality of pork to consumers. Skill development for butchers’ may be based on different factors like maintenance of hygiene and cleanliness during slaughtering, blood and waste management, aspects related to personal hygiene, storage and selling of pork. It is also important that pigs are certified by veterinarian before getting slaughtered. This process is more relevant in case of pigs as there are chances of occurrence of zoonotic diseases like porcine cysticercoses. An effective extension system developed for butchers with combined efforts of various agencies like Department of Animal Husbandry, Municipal Corporation and development projects can help in achieving the desired objective.

8.6 Marketing Models

8.6.1 Preliminary Marketing Model

The producer groups in the project villages can first target the butchers in the local markets for direct sale of pigs. Butchers, especially in the weekly markets struggle to locate pigs to maintain regular supply of pork at their shops. In this regard, a fortnightly/weekly (based on the availability and demand of pigs) rural haats of live pigs can be organized within the cluster of three to four villages. It will substantially reduce the cost of butchers in terms of transportation cost and the time and efforts they put in to locate and aggregate the live animals.

These haats must be equipped with pig weighing implements in order to arrive at fair pricing. A standard pricing method based on the live weight measurement will reduce the chances of loss incurred by the farmers due to their unawareness regarding right selling price of their pigs. The reduction in margins for butchers will get compensated by the reduction in their cost of aggregating pigs.

With subsequent increase in production, the producer groups can target butchers in the wholesale markets like the ones in Dhanbad and butchers in Bokaro. In future, the cluster can target markets in the North Eastern states, which has huge demand for pork. Policy intervention are required to smoothen the process of inter-state transportation, as unnecessary constraints posed by police in mid-way adversely affect the health of the animal. There is need to explore the potential to set up processing units within the state. It will act as an ensured marketing channel for the surplus production of live pigs. Processed pork has a huge market across India. As mentioned earlier in the report, experts visualize growth in demand for pork in the coming years.
Consider the following scenario as a possible marketing model for a cluster of 250 farmers. We assume that each farmer will have two pigs ready for sale in a year, each weighing 80 kg. In a cluster of 250 farmers, this translates into 500 pigs available for sale in a year. This means that the cluster has about 40-45 pigs for sale each month (if we were to average across the year). A butcher slaughters about 10 pigs in a month in the local market. So, if the cluster targets to sell to four such butchers each month, it will meet demand of 40 pigs.

Table 18 provides a preliminary marketing model keeping into consideration the above assumptions. In order to facilitate trading operations like aggregating and purchasing of pigs from farmers and selling it to the butchers and arranging the transportation, etc. an individual can work as a livestock commission agent. His income will come from the difference of selling price to butcher and the price paid to the farmers.

*Table 18 Trading price, operating cost and margins for supply of 40 pigs (over four weeks) to four butchers*

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Amount (INR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase of 40 pigs from the farmers @ INR 120/kg of live weight (80 kg of pig) (by the agent)</td>
<td>384,000</td>
</tr>
<tr>
<td>Cost of aggregation and management (Assuming that an auto hired by the agent goes for aggregation of 10 pigs from the farmers once in week costs around INR 1500 plus INR 2000 other cost)</td>
<td>8,000</td>
</tr>
<tr>
<td>Sale of 40 pigs to butcher @ INR 130/kg of live weight (80 kg of pig)</td>
<td>416,000</td>
</tr>
<tr>
<td>Margin of the agent (416000 - (384000 + 8000))</td>
<td>24,000</td>
</tr>
<tr>
<td>Margin per pig for the agent (24,000/40)</td>
<td>600</td>
</tr>
<tr>
<td>Transportation cost for butcher (Each of the four butchers will collect 2 pigs per week from the aggregation point-taking transportation cost to be 200 per pig) (200*40)</td>
<td>8,000</td>
</tr>
<tr>
<td>Estimated other business cost for the butcher (Including labor, making of sausages, gas cylinder, and shop rent, etc.) @500/pig</td>
<td>20,000</td>
</tr>
<tr>
<td>Sale Value of slaughtered pigs (estimated to be INR 180/kg pork price; Meat weight- around 80% of 80 kg= 64kg Including sausages – 75 kg) Selling price will be- 75<em>180= INR 13,500 Estimated selling price of 80 kg of pig= INR 14,000 (40</em>14,000) = INR 5,60,000</td>
<td>5,60,000</td>
</tr>
<tr>
<td>Cumulative Margin for butchers 560,000 - (416,000 + 28,000)</td>
<td>116,000</td>
</tr>
<tr>
<td>Margin for a butcher per pig</td>
<td>2900</td>
</tr>
</tbody>
</table>
This model presents the marketing strategy at stage one of the project where, it can target butchers in the local markets. With the eventual increase in production, this model can be replicated with change in figures depending upon the scale of production and trading; transportation charges and targeted market.

8.6.2 Advanced Marketing Models

At the advanced stage of the project, market linkages may be developed through contract/ contact farming for supplying specific number of pigs of specified quality and size. This kind of set up can be taken up with processing units or exporters. Specifically, in case of international trade, quality parameters are well defined and for that farmers are to be well-equipped with modern production practices at first place.

Alternatively, market linkages can be developed through electronic portal like ‘PashuBazaar’, which facilitates farmers to sell their animals without taking them physically to the weekly markets. It reduces the cost of travel and instances of distress sale. Through the platform, a farmer can do wide publicity of his/her animal to fetch better prices. It is beneficial for buyers as well in terms of the wide choice of animals to buy12.

8.7 Processing of Pork

There is a lot of potential for value addition through processing of pork in the state. As statistics delineate, processed pork products are high in demand across megacities in India. To quote the prices of some of the processed pork products as against INR 140-200/kg of fresh pork:

- Pork Pepperoni- INR 165/ 100 gm
- Pork Sausage- INR 100/ 100 gm
- Smoked Ham - INR 475/ 250 gm

Arohan Foods based in Assam is one of the major supplier of processed pork products within the country. JSLPS may develop linkages to learn on technicalities required for setting up and running pork processing units. Adequate linkages are to be developed with the farmers for ensuring regular and stable supply of live pigs to these units. Consider reviving of Ranchi Bacon factory so that value addition can be done within the state.

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9. FUTURE OUTLOOK FOR THE SECTOR

Pig sector in India has traditionally been the victim of social disapproval largely due to the filthy perception associated with pigs. This traditionally neglected status of pig has played a huge role in limiting the growth of the sector in India. However, with the up-coming changes in socio-economic and demographic profile of the country, it has started growing at a rapid pace, as evident through declining pig population at national level. There is an increase in realization of the nutritious value of pork. Besides, low cost of production and higher returns makes pig rearing a viable alternative to generate livelihoods for the economically weaker sections of the society. State governments are also increasingly investing in the growth of this sector. In view of the mentioned factors, experts envision high prospects for increase in demand of pork over the coming years.

Jharkhand has been one of the leading states in terms of live pig production in India. However, its percentage share in total pork production of the country is merely 4%. It may be attributed to the dominance of desi breed in the total pig population of the state, which translates in to low meat yield. Scarcity of required vaccinations and inefficient inter-state marketing channels are the two significant contributing factors that prevent the growth of pig sector in the state. Such a scenario is indicative of the fact that Jharkhand has not been able to contribute substantially to the increasing demand of pork at national level. Thus, it is important to strengthen the pig value chain in the state with adequate interventions both, at the ground level and at the policy level. An approach towards improved package of production practices, better marketing strategies and strengthening of market linkages, especially with the processing units within and outside the state is the need of the hour. On one hand, it will help in creating huge avenues in terms of livelihood generation for the small and marginalized farmers and; the landless community of the state. Whereas on the other hand, it will enable the state to effectively cater to the local, state, national and international demand of pork.
REFERENCES


http://www.worldstopexports.com/pork-exports-by-country/