Introduction

Classical swine fever (CSF) is a highly contagious, potentially fatal viral disease caused by positive sense RNA virus affecting pigs of all ages, which is endemic in northeast India. The Government of India has rated it fifth amongst the most important viral diseases of livestock prevalent in India.

The disease is characterized by sudden onset, rapid transmission, generalized bleeding and high mortality. CSF virus enters pigs through direct contact with infected carrier (recovered) pigs, contaminated feed and water, or through contaminated clothes, vehicles and workers. Clinical signs include high fever, loss of appetite, vomiting/severe diarrhoea, conjunctivitis, reddish or bluish discolouration at the extremities and convulsions/posterior paralysis. Disease outbreaks are often severe in piglets and crossbreds leading to higher morbidity and mortality rates.

How does CSF affect pig production?

CSF is a major constraint for the development of pig husbandry in northeast India where pig farming is one of the main sources of livelihoods for a majority of the households. About 80% of the tribal households in northeast India rear pigs. The majority of households keep one to three pigs (with a few households having larger numbers). The number of pigs available per 100 persons in the northeast is 18 compared to 4 in the country as a whole. Almost 100% of the tribals are meat eaters and pork forms the main meat in the daily diet.

CSF incurs direct costs to farmers, mainly as stock morbidity, cash treatment costs, replacement cost of dead animals and overall loss of livelihood. Veterinary authorities incur costs associated with preventing the disease and managing outbreaks, while national economies are impacted through restrictions on trade opportunities. The disease does not occur in humans so there is no direct impact on human health.

ILRI’s work on CSF

A participatory epidemiological study conducted in Assam, Nagaland and Mizoram in 2011 by the International Livestock Research Institute (ILRI) with the support from the Sir Ratan Tata Trust (SRTT) and Navajbai Ratan Tata Trust (NRTT) showed that pig farmers in India incur huge losses, over 2 billion Indian rupees (INR)¹ each year from mortality, treatment and replacement costs. It further conducted a secondary review of availability of vaccines in India, constraints to vaccine production and opportunities to produce more.

¹. USD 1 = INR 62.0225 at 27 February 2014.
Based on the study findings, ILRI played an advocacy role and highlighted the problem of CSF to the government. ILRI suggested some interventions such as to produce adequate CSF vaccine (India requires a total of 22.26 million doses of CSF vaccine per year and availability is hardly 1.2 million doses) and to launch a CSF control program with special focus on northeast India.

Towards this, ILRI in partnership with Assam Agricultural University organized a high level regional policy meeting of northeast Indian states to discuss ILRI’s study findings and to take necessary resolution for action by the government. Based on resolutions decided in the meeting, ILRI drafted a policy brief and organized a high level policy meeting with the central government departments in New Delhi in August 2012 to discuss and decide on the Guwahati resolutions. The meeting was chaired by the animal husbandry commissioner of India and ILRI’s regional representative.

The commissioner constituted a high level task force to chalk out a CSF control program for India and developed CSF control as a national program. Sufficient funds have already been allocated for the national CSF control program and the proposal has gone to cabinet to be cleared. It is expected that the program will be launched in early 2014.

As a part of the initiative, the government has also permitted and supported private vaccine manufacturers to produce adequate number of CSF vaccine for the country.

Animal Husbandry and Veterinary Biologicals, a company in Bangalore, after getting a trial license, has completed field trials and validated the effectiveness of the cell culture vaccine. They have also prepared their lab for inspection for GMP compliance by the local drug control authorities. After receiving a commercial license from the drug control office, they will start commercial production, probably in April 2014.

Indian Immunologicals Ltd, Hyderabad, has initiated the process to procure seed virus from IVRI, after which they will produce the cell culture vaccine and go for clinical trials obtaining permission from the authorities concerned.

How has this work advanced knowledge?
ILRI’s study has influenced both decision-makers and other stakeholders, including private vaccine producers, about the threat of CSF, the losses it causes and possible control measures. It also informed decision-makers about the current vaccine production capacity in the country and the very large supply and demand gap; scope to increase vaccine production (in the short and longer terms), as well as policy decisions required for adequate vaccine production and delivery. ILRI’s study has produced evidence to support increased vaccine production in an integrated CSF control program.

How will farmers benefit?
The initiative is going to benefit millions of pig farmers in India in general and northeast India in particular. This may also have impact on farmers across the border, especially in Myanmar. As proposed, all pigs are supposed to be vaccinated at a regular interval. Because of proper vaccination, pigs would be protected from CSF, resulting in proper growth and reproductive performance of pigs and more pork in the food basket of the poor.

In northeast India, there may be about 1.5 million pig rearing households who are going to be directly benefited from the initiative. Already it is noticed that in the ILRI project villages where vaccination was carried out mortality is reduced drastically; for example, no cases of death were reported due to swine fever during the last 18 months.

What is the value of these benefits?
The epidemiological study of 2011 carried out by ILRI in Assam, Nagaland and Mizoram reveals that the total loss to pig farmers (from mortality, treatment and replacement costs) amounted to INR 2.224 billion/year (Table 1).
The same study revealed that proper vaccination may prevent the following losses on farm:

- Mortality loss (price of pigs which varies depending on body weight): on an average INR 8481/pig
- Treatment loss: INR 17.50/pig
- Replacement loss: INR 1818/piglet

Vaccination may therefore prevent the above losses.

### Table 1: Projected economic loss of classical swine fever in three NE states

<table>
<thead>
<tr>
<th></th>
<th>Assam</th>
<th>Mizoram</th>
<th>Nagaland</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of mortality (INR)</td>
<td>1.775 billion</td>
<td>33.98 million</td>
<td>267.25 million</td>
<td>2.076 billion</td>
</tr>
<tr>
<td>Cost of treatment (INR)</td>
<td>24.07 million</td>
<td>0.44 million</td>
<td>0.004 million</td>
<td>24.51 million</td>
</tr>
<tr>
<td>Cost of replacement (INR)</td>
<td>102.10 million</td>
<td>1.93 million</td>
<td>18.79 million</td>
<td>122.82 million</td>
</tr>
<tr>
<td>Total costs (INR)</td>
<td>1.901 billion</td>
<td>36.35 million</td>
<td>286.04 million</td>
<td>2.224 billion</td>
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</tbody>
</table>

Source: PE study, ILRI, 2011.
Enhancing Livelihoods through Livestock Knowledge Systems (ELKS) is a partnership program between Sir Ratan Tata Trust and its Allied Trusts (SRTT) and the International Livestock Research Institute (ILRI). This is an ambitious initiative to generate new livestock knowledge and put the accumulated knowledge directly to use by disadvantaged livestock rearing communities in rural India.

ELKS aims to support SRTT and its Allied Trusts and their partners to enhance their capacities to improve livestock-based livelihoods in the hilly/tribal areas in Nagaland, Mizoram, Arunachal Pradesh, Uttarakhand and Jharkhand by (1) conducting research to fill technical knowledge gaps, (2) strengthening institutional mechanisms and (3) facilitating pro-poor policies.