

Case Study

Project Nandini: Enhancing livestock productivity

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Executive Summary

The livestock sector is a significant source of livelihood in rural Orissa as over 80 per cent of the population depend on livestock to earn supplementary income. However, the productivity of dairy animals in the state is low as livestock service delivery follows a reactive approach rather than a preventive, proactive approach to address the increase the productivity. In an attempt to provide enhanced livestock services, Government of Orissa has implemented Project Nandini, a livestock information system developed to offer livestock extension services to cattle farmers in Jagatsinghpur, Cuttack and Mayurbhanj Districts.

Under Nandini, a web-based portal is created to store a credible animal data along with details of their owners. The database records and identifies specific details such as a list of animal to attain peak yield, animal due and suitable for oestrus, animal due for pregnancy diagnosis, animal to be dried off, animal due for parturition, animal to be vaccinated/de-wormed. The intention is to systematically monitor the reproductive life cycle of crossbred cows by tracking relevant details. This monitoring is vital for enhancing the productivity of the cattle.

Based on the data available a decision support system is provided to government departments/functionaries. Reports generated out of a web software helps government livestock inspectors and veterinarians get a fortnightly 'To Do List' to render selective and need based services in a timely manner. The farmers receive crucial information related to the health and reproductive cycle of their cattle through the database by an automatic SMS alert, a helpline and also by visiting the village Common Service Centres. This information helps farmers to take accurate precautionary measures and gradually increase the productivity of their cattle.

Project Nandini as an innovation offers a streamlined, demand-driven livestock service delivery through use of a comprehensive online information system. This document seeks to capture the design and implementation approaches followed in the project, and highlight its impact. The replication of a project like Nandini in the area of livestock service delivery across the country will significantly enhance livestock health and productivity monitoring processes across the country.

Methodology

Working with the objective of identifying best practices in governance in India for the purpose of further replication, the Governance Knowledge Centre (GKC) research team conducts extensive research to locate initiatives that contribute towards the betterment of public service delivery. The GKC team conducted extensive secondary research using credible web sources to

establish the suitability of Project Nandini as a best practice. This research reflected the manner in which the project is providing vital information at vulnerable points in the productive and reproductive life cycle of cross bred cows in certain districts of Orissa. This timely provision of accurate information is helping in increasing the productivity of crossbred cows and increasing the incomes of livestock farmers.

Having recognised Project Nandini as a best practice, the next step was to identify the key stakeholders and interview them to gain a deeper insight into the operation and impact of the initiative. This document has been compiled by putting together the information collected through secondary research as well as the insights gathered through an interview with the Executive Director of the implementing agency i.e. Orissa e-Governance Services Limited.

Efforts have been made to provide objective information in the document. However, since only the implementers of the project were interviewed, there is a possibility of the percolation of subjective bias.

Background

In Orissa, besides agriculture, the livestock sector is a significant source of income to 85 percent of the population residing in rural areas. Small and marginal landholders depend on livestock production for supplementary income. However, the productivity of these animals in the state is generally poor as livestock service delivery follows a “fire-brigade” approach, which essentially means that problems are not addressed pro-actively. This combined with an inadequate animal recording system, a lack of awareness among farmers on how to enhance the productivity of their livestock and shortage of public infrastructure to deliver services to farmers on time makes livestock service delivery highly inefficient.

Project Nandini seeks to correct this inefficiency through the use of ICT. Its focus is on systematising the reproductive life cycle of crossbred cows by monitoring interventions for timely insemination, pregnancy diagnosis, peak yield, scheduled vaccination, de-worming, nutritional treatment and health. This monitoring is vital for enhancing the productivity of the cattle.

A door to door survey under the project identifies farmers who have crossbred cows. The details gathered through the survey are uploaded on a web-based portal to create a dependable animal database along with details of their owners. This web-based portal facilitates a decision support system (DSS) for government departments and functionaries to plan different interventions and ensure a proper monitored service delivery to cattle farmers.

Livestock service delivery agencies can use ICT as a powerful tool to provide extension services to dairy farmers through the exchange of vital information related to animal health care and production. Such extension services relates to the process of carrying scientific animal husbandry knowledge to livestock owners to enable them to utilize the information in making appropriate decisions to improve the production of animals and thus improve his/her economy.¹

Project Nandini implemented by the Government of Orissa in 2009 attempts to provide such livestock extension services to cattle farmers in Jagatsinghpur , Cuttack and Mayurbhanj District.

Objective

Project Nandini, aims to augment livestock productivity in Orissa by developing an information system that will help in providing services to livestock owners at vulnerable points in the productive and reproductive life cycle of the livestock.

Project Design

Key Stakeholders

Orissa e-Governance Services Limited (OESL) is the key implementer of the project, It is Special Purpose Vehicle (SPV) of Orissa Computer Application Centre, Govt. of Orissa and Infrastructure Leasing & Financial Services Limited (IL&FS) for the implementation of various e-Governance projects across the state.

Department of Animal Husbandry and Veterinary Services: receive vital information regarding the condition of livestock in these villages and then render services accordingly.

Veterinarians at the Veterinary Dispensaries (block level) and **Livestock Inspectors** at the village level undertake proper planning for delivery of services and extend timely services to the cattle farmers using the information received through the system.

Village Gomitra, part of the village community, are responsible for collecting regular information about the condition of the cattle in the village and providing this information to the data entry operators at the block level for updating the animal database.

¹ Sasidhar P V K and Sharma V P. "Cyber livestock outreach services in India: a model framework". Livestock Research for Rural Development. 2006.October 21, 2011<from <http://www.lrrd.org/lrrd18/1/sasi18002.htm>>

Farmers receive information about their livestock and can avail government assistance. They also provide relevant information about their cattle to the government so that the database can be regularly updated.

Information Flow

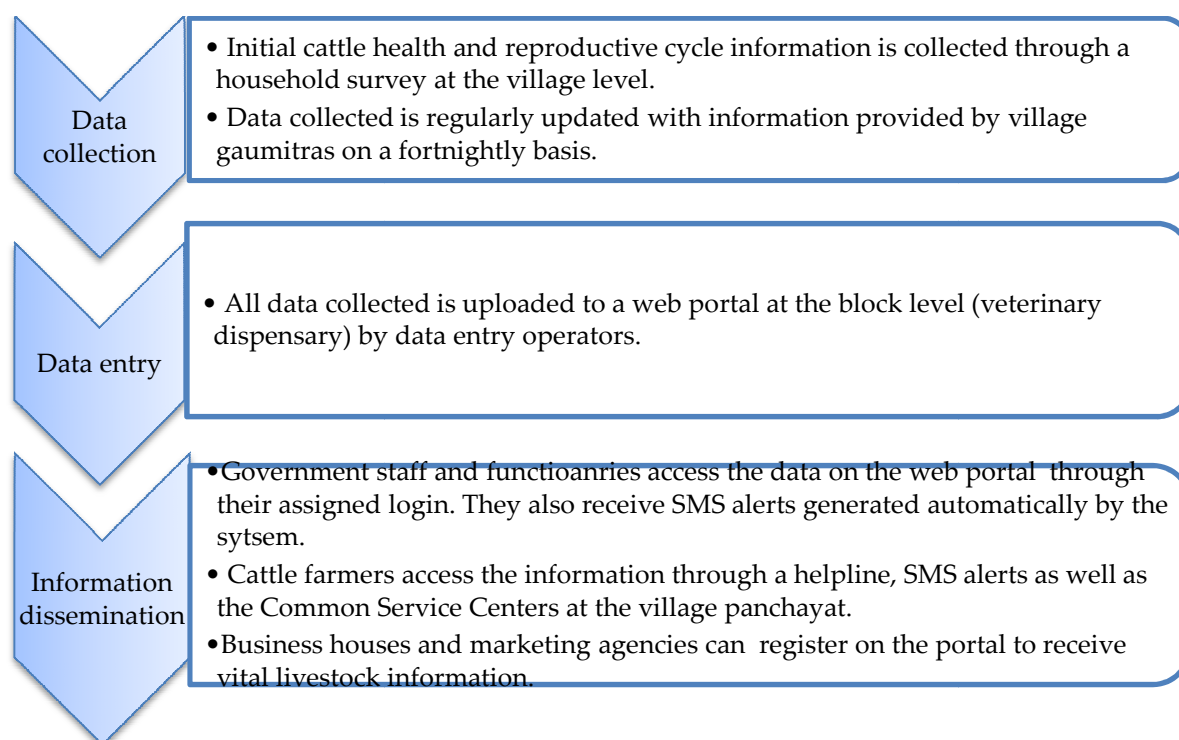


Figure 1: Diagram showing the information flow under Project Nandini

Data collection and entry

To create the initial database, a baseline survey was conducted to collect details related to animal identification, registration, and reproductive performance recording. This survey was conducted by veterinary students with support from livestock inspectors and village *gomitra* who were trained on techniques of data collection for a week. Till October 2011, the database for Jagatsinghpur District consisted of 15,000 households and 20,000 crossbred animals. The baseline survey for one block each in Cuttack and Mayurbhanj District is currently going on. This data is then handed over to data entry operators in the veterinary dispensaries at the block level, who upload it on the web portal from where the information is then disseminated. This data is updated fortnightly with information provided by the *gomitra*.

Information dissemination

The data collected from the field is organised in a specific manner on the portal to list out following specific details:

- animal to attain peak yield,
- animal due and suitable for oestrus,
- animal due for pregnancy diagnosis,
- lactating animal to be dried off,
- animal due for parturition,
- animal to be vaccinated/de-wormed.

Based on the statistics, a decision support system is provided to government functionaries. Reports generated out of a web software helps to prepare a fortnightly task list, known as 'To Do List', for government livestock inspectors and veterinarians to render need based services on priority basis. In addition, a mobile feature is integrated with the database to send a fortnightly SMS alert to the concerned service provider regarding his/her 'To Do List'.

Technology

The web-based application has been developed using PHP technology and hosted through Apache Web server. The entire web based application is based on a 3-tire architecture using LAMP technology (L-Linux A-Apache M-MySql P-PHP). The software's used are open source which lowers the system implementation cost.

The entire application is based on role-based security, starting from stakeholders at the gram panchayat level and upwards. The application has also been enabled to send bulk SMSs to service providers and farmers.

Receiving such fortnightly alerts enables the officer in charge to administer the required service on time and highlights areas of concern which helps in developing appropriate solutions.

Similar efforts have been made to ensure efficient and timely information dissemination to ultimate beneficiaries. Crucial information on health of the livestock is dispersed among the farmers through three mediums. First, a proactive measure is followed to send customised SMS alert to the farmers to inform them on health and reproductive cycle of their cattle. Second, farmers have the option of visiting the Common Service Centres situated in their Gram Panchayat and seek information from the livestock inspector. Third, a farmer can call a toll – free helpline with specific queries related to livestock. Availability of timely information helps the livestock farmer to take immediate action concerning their cattle and avoid any losses in terms of productivity.

The portal also caters to the suppliers of the livestock products by making information available on demand. A business house or marketer can register themselves on the portal to receive information on

- livestock farming system inputs,
- better pricing of animals and
- animal produce like milk and milk products

Integrating product marketing information has helped in streamlining the availability of milk products in the region making it easier for suppliers to locate high yield areas.

Capacity building and awareness creation

To achieve the objectives of the project, trainings programmes were organised for officers of veterinary dispensaries, livestock inspectors and *gomitras*, in a phased manner. Training was given in data collection, data entry and updating and utilization of the online portal for generating useful information related to the livestock and observing trends and patterns.

A participatory approach was followed to mobilise the community; meetings with farmers, Panchayat members and public were held at village and block-level. Similarly, workshops and seminars were organised for officials from Animal Husbandry and Veterinary Science departments of Orissa and domain experts from Orissa University of Agriculture and Technology (OUAT). One-to-one interaction with service providers and farmers helped in understanding their needs and problems and in helping them realize the necessity of having a information system like Nandini in place. This contributed in contextualising the project addressed to the local factors.

Financial Resources

The project was initially financially supported by UNDP through the Department of Information Technology, Government of India. These funds were utilized for implementation of the project in Jagatsinghpur district. Subsequently the Government of Orissa agreed to support the roll out of Project Nandini in Cuttack and Mayurbhanj districts.

Achievements

Efficient information provision

To Service Providers: The livestock information system is being effectively utilized for accessing information related to the condition of livestock in their respective districts. By highlighting areas of concern to the service providers, the government is ensuring timely delivery of services and solutions. Simplifying and streamlining the information flow has strengthened the monitoring of the performance of livestock officials at all levels. Officials now are able to avoid delays that are often created due to lack of availability of accurate information for designing newer solutions and taking troubleshooting measures.

To Livestock farmers: The needs and concerns of livestock farmers do not get highlighted in policy circles. . The onus of resolving livestock sector related concerns usually falls on the community of livestock farmers who may not have proper access to scientific information related to their cattle. Nandini is aiming to change this by creating an information channel between service providers and livestock farmers. Farmers now get regular updates about the condition of their livestock and are able to avoid any unforeseen problems. By receiving information about the health of their cattle and their reproductive cycle farmers take accurate precautionary measures. Over time the productivity of their cattle is increasing as they are provided with timely care.

Creation of a livestock management system

Nandini is a unique initiative in India that uses ICT to address concerns in the livestock sector. Technology used in the project is facilitating proper flow of livestock related service delivery by creating linkages between the service users (livestock farmers) and providers (government). Establishing a definite flow has allowed to bridge the gaps in service delivery. An information system like Nandini for livestock monitoring can be utilized across various states in India for streamlining services related to livestock. There is demand for information both at the level of service providers and at the level of end users i.e. farmers, by supplying this required information Nandini is addressing a vital gap.

Challenges in Implementation

Like most new initiatives, Project Nandini also faced the problem of convincing officials and farmers alike about the necessity and the efficiency of such an information system. Overcoming problems of convincing stakeholders, awareness was created using a bottom-up approach and gradually Nandini established itself as a workable platform. It is now being actively used by all stakeholders.

Financial sustainability has been the major challenge for the project. While the Government of Orissa has agreed to cover the major cost of implementation including setting up the IT infrastructure, conducting the survey and impart training, for Cuttack and Mayurbhanj districts, it has recommended exploring a more cost effective model each households for collecting information. A direct mobile based system is proposed to gather data directly from the farmers and store it in the database. The system is planned to work on an interactive SMS mode to reduce the burden on human resources. The interactive SMS application is being worked upon and will gradually be rolled out in the remaining high livestock dependant regions of Orissa.

The project also seeks to encourage private enterprise in livestock business by involving multiple players. The private participation model will require farmers to pay for the information services on an annual contractual basis.

Conclusion

By introducing the use of ICT in the livestock sector, Nandini has opened new possibilities of transforming livestock related service delivery and information provision. The project has achieved success because of need-based, demand driven approach followed in implementing the model. A project similar to Nandini has the potential to significantly modify livestock health and productivity monitoring and enhancing processes across the country.

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Appendix A – Interview Questionnaire

Background

1. What was the condition of livestock service delivery in the state prior to the introduction of the project?
2. The main objective of project Nandini is to provide livestock healthcare and productivity information to livestock service providers and farmers. Can you briefly explain these objectives? For example, type of healthcare services planned to be offered, or productivity information.
3. Nandini is implemented in Jagatsinghpur, Cuttack and Mayurbhanj districts of the state. Is the project active in any other districts? What is the current status of the project in each of these implemented districts?
4. Why was Jagatsinghpur identified as appropriate location for pilot?

Program Design

Stakeholders

5. The key stakeholders in the project are Orissa Computer Application Center, Technical Directorate of IT Department, UNDP, Department of Animal Husbandry and Veterinary services, livestock inspectors, veterinarians and farmers. What are their roles and responsibilities?
 - a. Are there any other stakeholders? If yes, please explain their roles and responsibilities.

Data Collection

6. A survey is conducted to gather information on crossbred cows in project implementation districts. Can you explain the process followed for the survey? For example, what kind of data is gathered? who is responsible for data collection and how is the data managed?
7. The information from the survey is entered into the livestock information system. Where is this data entry done?
8. Is there any training session for the field surveyors?

Information flow

9. Based on the data collected, a decision support system is provided to government agencies, with a fortnightly "to do" list through the livestock information system. Which government agencies does the decision support system cater to? What kind of information are these agencies provided with?
10. How do the livestock service providers access information? How is the information from livestock service providers then passed on to business houses and marketing agencies?

11. Farmers receive information regarding animal healthcare, productive and reproductive cycle and marketing and pricing. Can you elaborate on the content and significance for each of the above?
 - a) Why is it important to provide marketing and pricing information? How do farmers typically access pricing information?
12. How can farmers access the information under the project?

Capacity Building and awareness creation

13. What kind of training was provided to government functionaries for implementing Nandini? Who provided the training?
14. How did the functionaries respond to the introduction of a transparent ICT led information system? Was there any resistance? If yes, how was it overcome?
15. What efforts were required to generate awareness and create need amongst farmers for Nandini? How did the farmers respond initially?

Technology

16. Nandini is a web portal that provides livestock information to service providers who then provide relevant information to farmers either through SMS, call centres or common service centres in villages. The main technological components are the web portal, call centres for helpdesk and grievance redressal queries and mobile technology using SMS. What was the logic behind selecting multiple mediums for information dissemination?
17. Who built the web portal? Can you elaborate on the softwares used? Are they open source or propriety? Please explain the reason for the choice of either?
18. Where are the call-centres located? Who are responsible for answering the calls? Are these personnel trained to provide accurate information to farmers?
19. What percentage of farmers utilise the SMS service? In what language are these SMS sent?
20. Who is responsible for technological troubleshooting?

Monitoring

21. What monitoring mechanisms are in place to ensure proper implementation? For example, how do you ensure that livestock service providers follow their “to do” list and provide timely service to farmers?
 - a. What happens if they a service provider fails to respond to the needs of the farmers?

Financial Model

22. Can you explain the financial model for the project? The project was initially funded by the UNDP and is now financed by the Government of Orissa. Do the funds come from grants under the NeGP?
23. There are plans to charge farmers for the services and start a revenue generating model? Can you elaborate on this? How will farmers be convinced to pay?

Impact

Achievements

24. What are the major achievements of Nandini? What has been its impact on:
 - Livestock Service delivery agencies in the state: livestock inspectors, veterinarians, livestock semen banks etc.
 - Farmers
 - Livestock productivity and marketing in the state

Challenges

25. What are the major challenges faced in the implementation of Nandini. How were they overcome?

Enhancements

26. . What are the major enhancements planned for the future? Are there plans to upscale the initiative to the entire state?
27. Have any other states showed interest in replicating Nandini? What do you think are the necessary preconditions for the success of such an initiative?

Data

28. Can you provide us with the following data:
 - a) Number of villages that the project covers
 - b) Number of households and cattle information covered on the Livestock information system
 - c) Number of SMS sent to service providers and farmers
 - d) Contact details of other stakeholders particularly a farmer
 - e) Pictures

Farmers

1. Do you know about project Nandini? Has data on your livestock been collected?
2. Have you utilized Nandini for getting information about your livestock? If yes, where did you go for the information? Did you use the helpline?
3. Have you ever received an SMS about your livestock?
4. What kind of information does Nandini provide to you? How is it beneficial for you?
5. Do you have any complaints and suggestions?