AGRICULTURE, ANIMAL HUSBANDRY, DAIRY DEVELOPMENT AND FISHERIES DEPARTMENT

3.5   Computerisation in Agriculture Department

Highlights

For computerisation of various administrative, technical and monitoring functions of Agriculture Department, Government appointed (June 1999) National Informatics Centre (NIC), Pune as the Turnkey Solution Provider (TSP). As of March 2007, expenditure incurred on computerisation was Rs 13.81 crore.

Six modules developed in October 2001 at the cost of Rs 33.55 lakh were not in use for want of trained staff.

(Paragraph 3.5.7.1)

In absence of the source code for modules, Department had to totally depend upon National Informatics Centre, Pune for modifications.

(Paragraph 3.5.7.2)

Logical access controls were absent making the software in use not reliable.

(Paragraph 3.5.7.3)

Web based application Agriculture Census was not updated and was not used for decision making for want of correct, complete and updated data, resulting in additional liability of Rs 14.85 crore in two districts.

(Paragraph 3.5.7.6)

3.5.1   Introduction

Government decided (October 1998) to computerise various administrative, technical and monitoring functions of Agriculture Department and appointed (June 1999) National Informatics Centre (NIC), Pune as the Turnkey Solution Provider (TSP). NIC was to develop 24 modules of which two modules were general modules useful for all departments (presently offline), 11 offline and 11 were online (internet/intranet based). During 1998-2000, Government provided funds for the computerisation plan of the Department. From 1 April 2000, the computerisation plan was being funded under the Centrally sponsored scheme 'Effective use of information technology for Agricultural development'.

As of March 2007, expenditure of Rs 13.81 crore on hardware (Rs 6.17 crore), networking (Rs 2.70 crore), software (Rs 0.76 crore) and other items (Rs 4.18 crore) was incurred.

3.5.2   Aims and objectives of the Department

Agriculture information is a service sector wherein activities for catering to the varied needs of the farmers are performed. It was thought that computerisation would help in assessing these needs in a more accurate way. The project proposal aimed:

↘   to develop database on various agro related activities based upon village level production plan,

↘   to assess international and intra-national information via internet facilities to provide inputs to the village plan,

↘   to establish two way communication for transfer of data and records thus saving on communication and travelling expenditure while implementing village plan,

↘   to process data for efficient reporting system,

↘   to simplify office work through the use of packages like information support for watershed development works, rainfall, crop census, soil testing/seed testing laboratory management, nursery management, personnel information system, progress of expenditure and training activities for improving the overall efficiency of the department at all levels of management.

3.5.3   Organisational set-up

Principal Secretary of Agriculture Department is the overall in-charge of the department. At State level, he is assisted by the Commissioner of Agriculture and five Directors at Pune, eight Joint Directors (JD) at Divisional level, 33 District Superintending Agriculture Officers (DSAO) and 332 Taluka Agriculture officers (TAO).

3.5.4   Audit objectives

The audit objectives were to assess whether:

↘   standard practices for development of modules by preparation of user requirement specifications (URS) and system requirement specifications (SRS) were followed;

↘   the data entered in the system was complete, correct and trustworthy;

↘   complete audit trail in the form of access control logs existed;

↘   departmental instructions for various hardware procurements were followed; and

↘   there was a proper and effective system for monitoring the implementation of the computerisation plan.

3.5.5   Audit criteria

Audit criteria against which the evidence was tested for the purpose of arriving at audit findings and conclusions were as follows:

↘   Best practices for IT development and implementation;

↘   Government Resolution (GR) issued by Directorate of Information Technology (DIT) as guidelines for computerisation and

↘   Departmental instructions.

3.5.6   Scope of audit and methodology

Performance audit of five[63] modules out of 24 modules developed and implemented by NIC in three[64] offices of JD, eight[65] DSAOs, and 80 TAOs along with test check of records at Mantralaya and Commissioner of Agriculture, Pune was conducted between April 2007 and May 2007. Selection of individual offices for test check was based on simple random sampling. Extraction and analysis of data was done by using Computer Assisted Audit Techniques (CAATs) where necessary. An entry conference was held with the Principal Secretary, Agriculture Department, Government of Maharashtra in March 2007. The replies from the Department were awaited (August 2007). Accordingly, exit conference could not be held.

Audit findings

3.5.7.1   Software development

According to the directions issued (December 1998) by DIT, the TSP was required to furnish the project implementation schedule. Time schedule for development, testing and implementation of the modules was neither prepared by the NIC, Pune nor insisted upon by the department. Sum of Rs 33.55 lakh was paid for development of six[66] modules (October 2001) to serve as a tool for monitoring the activities and for the management information system (MIS). Commissioner of Agriculture accepted (July 2007) that out of 24 modules, six[67] were not in use and seven[68] were partially used. Test-check of offices of eight DSAOs, 12 Sub DSAOs, 62 TAOs and five Soil Testing Laboratories revealed (April-May 2007) that none of the modules was available in 21[69] offices. Also out of 11 modules in use, four[70] modules were

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[63] EGS Horticulture estimates, Soil Testing Lab Management, Agriculture census, Monitoring and evaluation of watershed activities, Pay Roll

[64] Kolhapur, Nasik, Pune

[65] Beed, Buldana, Gondia, Hingoli, Kolhapur, Nagpur, Nasik, Pune

[66] Crop estimation survey for fruits and vegetables, staff training and monitoring, agro poly clinic, model project plan for saturation index, monitoring and evaluation of watershed activities and taluka seed farm monitoring

[67] Estimation Package for Soil Conservation activities, Monthly Progress Report, Management for Taluka Seed Farming, MES of Agriculture and Natural Calamities.

[68] Horticulture nursery management system, Seed multiplication Farm Monitoring System, Staff training and monitoring, Agro Polyclinic and Farmers training, Frequently asked questions, Information System for watershed projects, MPR and scheme beneficiary information system.

[69] DSAO-1, SDAOs -3, TAOs -16 and STL -1.

[70] CES for Horticulture, Crop Estimation survey, Timely reporting of Agriculture and Crop Watch

not in use in any of the offices for want of trained staff. Thus, the modules remained unutilised for want of deployment and trained staff. The accountability for the deployment could also not be enforced due to the absence of the Project Implementation Schedule as required by the DIT. The purpose of computerisation thus could not be realised.

3.5.7.2   Absence of ownership of source code, modules and data

The instructions issued (December 1998) by DIT stipulated that all the modules developed for computerisation should be accompanied with detailed documentation about the modules. Similarly, the TSP should also provide the 'source code' within three weeks of acceptance of the modules by the user. The computerisation of the Agriculture Department started in 1999.

It was observed (May 2007) that the above requirements were not complied with by NIC and Department also did not insist upon complying with them.

Department did not train its staff to handle the system administrator work such as creating users and granting/revoking privileges. Also, domain expertise and separate IT cadre was not available in the department to handle the modules, data and databases.

The ownership of web based data rested with NIC, Pune, Commissioner of Agriculture (COA), Pune accepted the facts and stated (May 2007) that NIC is a government organisation and hence, the ownership of the source codes was retained with NIC, Pune.

Thus, in absence of proper documentation, ownership of source code, department had no means to monitor or control the system when required and was totally dependant upon NIC, Pune even after almost eight years of computerisation.

3.5.7.3   Inadequate logical access controls in modules

Initial access to the modules was to be controlled by 'user name and password'. For EGS horticulture module, access control was neither provided by NIC, Pune nor insisted upon by the department. Further, the 'user names and passwords' for modules test-checked (April-May 2007) have not been changed since their date of installation. Inadequate access control made the data base vulnerable.

3.5.7.4   Integration of software

NIC was to develop 24 application softwares to cater to the needs of the Department. As such, possibility of integration of the related modules ought to be explored at the initial stage of development of software as the functions of the Department were inter-related with each other. Due to non-linkage of these modules it was not possible to generate consolidated information required for MIS and decision support for policy makers. Thus, failure of the Department to anticipate the need of an integrated system at initial stage defeated the purpose of computerisation.

Department accepted the fact (July 2007) and stated that initially the modules were developed considering the usage in isolation. However, over a period of time a need was felt to link the modules/database. This shows lack of any strategic thinking while computerising the functions on part of the Department.

3.5.7.5 Duplication of work

During 1999, Department had developed 'Personnel Resource Information System' (PRIS) through NIC, Pune for capturing personal information of all the employees working in the Department. The input form was consisting of 21 pages. Accordingly, personal information of each employee was fed by the department. Subsequently, in the year 2006 General Administration Department developed internet based 'Sevarth' software through NIC, Pune for the same purpose for all the Departments with additional information consisting of six pages. Agriculture Department had to feed the data afresh in 'Sevarth' software based on new input form as NIC did not make provisions in the 'Sevarth' software for porting of data from the older versions of their software to the new software, that resulted in duplication of data entry works in respect of all employees in Agriculture Department leading to wastage of manpower and time. Department stated (July 2007) that the NIC was unable to develop a module for porting of the data from old module due to technical difficulties. This reply was not acceptable as NIC was also the TSP for the Department and it could not design an appropriate module for avoiding duplication of efforts, nor was this insisted by the Department.

3.5.7.6 Failure to update data

Government of India has been conducting Agricultural Census from 1970-71 with an interval of five years for agriculture planning by collecting information on agriculture such as number, area, tenancy, land utilisation, cropping pattern, irrigation facilities available *etc.* It was observed (April 2007) that data available in the Agricultural Census module of Government of India was not updated after the year 1995-96 and it also did not have data relating to 11 districts of Vidarbha Region. It was noticed (May 2007) that while other States had the option to update the data, Maharashtra State did not have the facility in the module. Commissioner of Agriculture stated (May 2007) that due to the non-cooperation of the field staff of Revenue Department, data on agricultural activities from 1995-96 was not collected. It was further stated that the work of data collection for 2000-01 had been taken up while the work for the year 2005-06 was yet to be taken up.

In absence of updated data, the statistical wing of the Department collects data on agricultural activities during *kharif* and *rabi* seasons. Similar data was also collected by the Talathis of Revenue Department. It was observed (April-May 2007) from the records of DSAO, Beed and Nasik that data for cultivation of cotton in Kharif season of 2005 from these sources varied upto 123 *per cent* as follows:

District	Area under cultivation as per the record of Commissioner of Agriculture	Area under cultivation as per the record of Revenue Department	Difference in the area of cultivation	Percentage of variation
	(Hectares)			
Beed	167200	286048.73	118848.73	71
Nasik	24052	53657.19	29605.19	123
Total	**191252**	**339705.92**	**148453.92**	

During *Kharif* 2005, cotton crop in some of the areas of the districts was badly affected by a disease (*Lalya* in Marathi). To compensate farmers from the loss of cotton crop due to this disease, Government announced (February 2006) compensation at the rate of Rs 1000 per hectare (ha) limited to two ha area affected by the disease. Scrutiny of records of compensation paid with DSAO, Beed and Nasik revealed (April-May 2007) that the area as worked out by the Revenue Department jointly with the Agriculture Department was considered for grant of compensation for loss of cotton crop in *Kharif* 2005 instead of area as per the records available in the Agriculture Department resulting in additional liability of Rs 14.85 crore on account of compensation to farmers.

It was also noticed that the Vasantrao Naik Shetkari Swawalamban Mission, Amravati created to implement packages for farmers in distress in six[71] districts of Vidarbha (2005-06) did not have reliable data from Agriculture Department. It was seen that payment of compensation (Rs 129.46 crore) in the Vidarbha Region was made based on the area as per the records of the Revenue Department which was 5,47,885 hectares more than the area reported by Maharashtra Remote Sensing Application Centre (MRSAC) and 1,91,326 hectares more than that reported by DSAOs (**Appendix-3.13**).

Thus, the data on agricultural activities collected by the Department was incomplete and highly unreliable.

3.5.7.7 Procurement of hardware

↘ **Procurement of computers in excess of requirement**

SRS for computerisation envisaged use of 781 computers at various levels for running of the modules. It was observed (May 2007) that the department had 1032 computers as of May 2007 indicating that 251 computers purchased, at the cost of Rs 85.94 lakh, were in excess of requirements projected in the SRS. Commissioner of Agriculture stated (May 2007) that 22 computers were required for new talukas and due to increase in work load, new purchases were made. It was, however, observed in 21 offices that the modules developed by NIC were not in use and computers were provided to six[72] offices without considering their effective use. Even after considering requirement of 22 computers for talukas there was excess procurement of 229 computers costing

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[71] Amravati, Akola, Buldhana, Washim, Wardha and Yavatmal
[72] DSAO Hingoli, TAO Ashti, TAO Basmat, TAO Hingoli, TAO Motala and TAO Parshiwani

Rs 79.32 lakh. Thus, utility of computers purchased in excess of requirement was not justified.

↘ **Failure to use internet and intranet facility**

Department purchased 513 modems costing Rs 16.27 lakh during the period from 1999 to 2006 for availing of internet facilities in the State and connectivity among all offices from top to root level. It was observed (April-May 2007) in 45 offices out of 89 test-checked (53 *per cent)* that the modems provided were not used for transmission and uploading of data, sending and receiving e-mails etc. and were lying idle from last eight years. The officers accepted the non-use of modems and agreed to make efforts to keep the connectivity live by authorising field offices to get local vendor's connectivity and purchase new modems by replacing old faulty modems. As the modems were not in use, exchange of data and information was being made through postal services.

3.5.7.8 Disaster recovery plan

Back-up and restoration plan was to be prepared by the Department for on-site and off-site storage of the data files, softwares and related documentation so that in case of major disasters like flood, fire, earthquake, theft or continuous major power failure, operations could be resumed with minimum loss of time. In 86 *per cent* of the field offices (76) test-checked, the backup of data and copies of modules in use were not kept.

Hardware in TAO, Kalamnuri (District Hingoli) was completely damaged in a fire occurred on 29 May 2002. As the TAO did not have the copy of the module and the backup of the data and also the DSAO, Hingoli did not have copies of modules. After five years of the incidence the operations in TAO, Kalamnuri had not been resumed (May 2007) itself indicated the inadequate restoration plan.

3.5.8 Monitoring of IT-system

Department did not devise any specific system for monitoring implementation of the computerisation plan. Commissioner of Agriculture confirmed (May 2007) that core group or a committee to monitor the computerisation was not formed. It was further stated that the Directors concerned are supposed to monitor the development and usage of the software.

3.5.9 Conclusion

Computerisation plan in the Agriculture Department, taken up for implementation from 1999, was not implemented after investment of Rs 13.81 crore in absence of a proper IT strategy for its development, non preparation of URS and time frame for completion. This defeated the objectives of computerisation in the Department. Of the 24 application softwares, only five were being used and even these were partially implemented across the state. Ownership of source code, modules and web based data rested with NIC even after eight years of implementation leading to continued and total dependence on NIC rather than monitoring and

coordination with NIC. The Department did not develop in house capabilities to undertake to operations of the systems as it did not have trained manpower. The sustenance of performance of the computerised system in such a situation was doubtful. Integration of the modules, which should have been logical, to support any decision support system was not even conceived. The communication infrastructure was inadequate. The data contained in different modules were not updated and lacked reliability. It was not possible for the department to make informed decisions. The Department, thus, could not attain the objectives of computerisation as well as that of Agriculture Department wherein the agriculture information could cater to the varied needs of the farmers. The expenditure of Rs 13.81 crore apart from manpower, time and other resources went unutilised.

3.5.10　　　Recommendations

↘　　Department may stipulate time frame for completion of development and implementation of all modules by NIC.

↘　　The modules should be integrated to assist in decision making and providing relevant and timely information

↘　　Training to the staff should be provided for making optimum use of the available modules and also to be able to operate the system themselves.

↘　　Missing controls in the existing software should be inserted.

↘　　The expenditure on any additional hardware should be justified and available resources be put to use.

↘　　Necessary communication infrastructure should be in place to support the exchange of information across the modules and the State.

The matter was reported to the Principal Secretary to Government in June 2007. Reply had not been received (August 2007).