

National Rural Employment Guarantee Act (NREGA) – AP Software*

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ABSTRACT

NREGS - AP software is a web based end-to-end ICT solution with local language interface to ensure that the objectives and entitlements of National Rural Employment Guarantee Act (NREGA) reach the wage seeking rural households. The software developed by TCS has many modules that include wage seeker, work estimates, work execution and payments, material management, reports, analysis, and administration. The job cards, the work estimates and wage payments are handled through software to enable timely payments and ensure at least 100 days of wage employment to a wage seeking household within a financial year. By entering simple measurements, the estimates are generated within minutes. The technical approval, PO clearance, and administrative sanction of the works are captured. Any work after it undergoes these approvals becomes a part of 'Shelf of Sanctioned Works'. The works are opened and letters to executing agency and material supplier are generated from the computer to avoid any delays. The customized measurement sheet for that work also generated. The muster and the work done report for the week are taken to compute the wages and generate pay order along with pay slips. Within the working group based on the muster and out turn the wage is calculated equally among men and women. The wages are deposited into the individual saving accounts of the wage seekers thus avoiding any middlemen. Payments through smart cards or Village organisations' are also being planned. For material payment, based on the material supplied pay order is generated and the payment is made to the material supplier's account. The entire expenditure of the scheme is captured thus enabling accounts and auditing. All reports are system generated by picking transactional data from the work flows. Data is uploaded into Central server through proper backup. So irrespective of time and location, the stakeholders through the portal 'www.nrega.ap.gov.in' can browse information about the villages, work status and wage payments. This instills transparency and accountability. The viewer can drill down up to household level and even up to works and muster level. By making data available for public scrutiny, the portal facilitates social auditing of the NREGS implementation. The provisions of Right to Information Act are fully complied.

The NREGS-AP software is developed after taking the inputs from all the stakeholders. It has many modules that include wage seeker, work estimates,

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work execution and payments, material management, reports, analysis, and administration.

1. Introduction/Background

Project conceptualization

Tata Consultancy Services Limited (TCS) consultants studied the draft bill on NREGA, analyzed a similar scheme that was implemented in Maharashtra and proposed an Information and Communication Technology (ICT) solution to GOI. Based on the proposal Andhra Pradesh was taken as pilot. Stakeholders meetings were conducted. Direct interaction with the stakeholders and earlier experience in implementing such schemes necessitated the formulation of this project. When similar schemes were implemented earlier, in the absence of any extensive use of Information and Communication Technology (ICT), it was very difficult to address the matters of concern. GoAP set up an exclusive team for getting the software developed. This team provided domain knowledge of work estimates, the formulae involved and the calculations needed to the TCS team (Consultants). The nuances of the scheme, the business process and the required UIs were also explained. In fact the entire development of application is closely monitored and inputs are provided on almost daily basis.

2. Project Vision, stakeholders, objectives and services

The broad vision is to have low cost and fail-safe technologies that will have a more efficient, strategic and inexpensive way of

- Putting the wage seeker at the centre of operations.
- Expediting payments and measurement cycle to ensure timely and correct payments to Citizens ·
- Providing a system driven accountability mechanism
- Ensuring open access to information to all stake holders and citizens of the country.
- Enabling reliable, timely and comparable information from the “ground-up”
- Minimizing administrative costs·
- Tracking every rupee spent on the scheme. In other words - open the black box of the missing 85 paisa as regretted by the Late Prime Minister Shri Rajiv Gandhi

- Minimizing leakages to ensure that the benefits reach the citizens, stakeholders, Wage Seekers, Village Level functionaries, Mandal Level functionaries, District level functionaries, State level functionaries, Other Depts, Govt of India, CBOs, NGOs, all citizens.

3. Objectives

The aim is to have a positive implementation of the scheme by:

- Transparency and visibility. All the stake holders' viz. citizens, media, NGOs, officials, politicians are viewing the data live on the internet, and using the information for furtherance of the cause.
- Increase in accountability. Details of personnel and officials involved in implementation at each stage are being logged into the system increasing the accountability.
- Minimizing fraud. The system has effectively blocked all the possible leakages thereby reducing fraud to a great extent. By making available the Standard Schedule of Rates for each locality available online, there is no possibility for excess sanction of amounts and subsequent recoveries at a much later date.
- Minimizing effort and administrative costs. A cumbersome process of preparing estimates has been simplified duly saving several man months of unproductive time which otherwise the field officials would have had to spend in the process. Use of this solution enabled the state to reduce the overall administrative cost, which otherwise would have costed many-fold.
- Accurate and faster wage payments. The payment cycle has been significantly reduced to less than 15 days. Payments to wage seekers are being made entirely through agencies like banks and post offices ensuring that the right amount reaches the worker.
- Change management of policies, rates etc. Changes in policies, work estimation standards, payment rates during the course of implementation of the scheme based on ground realities could quickly be adapted.
- Program Monitoring. The program is being closely and effectively monitored using the system. Fulfillment of 100

days guarantee for every House hold can be monitored. Every work and every rupee spent on EGS can be tracked. All the MIS reports required by the district, state and central administration are readily available, reducing the effort of preparation of such reports and increasing the accuracy of data.

- Facilitating Social Audit. Another unique feature is that the entire information is available on Internet both in English and local language of Andhra Pradesh i.e., Telugu. Officials or even public can take the social audit reports and check in the field. By making data available for public scrutiny, the NREGA Portal facilitates social auditing of the NREGA implementation, under the Right to Information Act.
- Easy tracking of all the processes of EGS to ensure that the entitlements like equal wages, work site facilities; timely wages etc reach the citizen.
- Effective Decision Support System to avoid slippages in implementation

4. Services

- Job card generation and printing in vernacular languages
- Detailed engineering estimates of works proposed
- Generation of details of task-wise effort and material spent
- Technical and administrative approval processing of proposed works
- Direct payment of wage and material to beneficiaries
- Complete reconciliation of wage payments and work progress
- Real time tracking of number of days worked and wages paid
- Material indenting, receiving, payment and reconciliation capability
- Close monitoring and tracking of works and payments through 'Dashboards'
- Tracking of inflow and outflow of funds
- Detailed analysis of data for assessing and improving the system implementation
- Generation of MIS reports
- Facilitate performance evaluation of programme officer.

5. Roles and Responsibilities

The project is not based on business model. TCS developed the software as CSR. Only the operational and maintenance costs are involved. The funds are received from GOI & GoAP for NREGS – AP scheme. This project is looked upon more as a welfare measure to ensure that the entitlements in the scheme reach the target groups, than a business proposition.

6. Necessity/Needs

The following are some of needs that had to be addresses through the software:

1. Bogus registrations included registration of non-living persons, minors, medically unfit persons and they were even fictitious
2. Delay in preparing estimates and giving technical sanctions since thorough scrutiny of estimates was needed. As the Mandal level functionaries had limited technical sanction powers the file had to be sent to higher officials thus adding to further delay. So the works started late though there was demand for work. Moreover there was no uniformity in preparing the estimates. The estimates were sometimes inflated to suit certain interests.
3. The musters were never maintained and even when maintained included ghost workmen and bogus attendance. Identifying a work with a muster was very difficult.
4. The requisition of funds were based on false measurement of work, inflated progress of works and even omitting an operation or work item. The reporting of inflated progress never revealed the ground reality. . The implementation processes were not uniform as process monitoring was very difficult
5. There was underpayment of daily wages, as well as fraudulent wage payment and delays. There were no equal wages among men and women. The payment to wage seekers was irregular and often less than what they are entitled.

7. Project plan

Job cards: The photo in the job card is captured from the database of the Civil Supplies Department's IRIS ration cards.

Estimates: A cumbersome process of preparing estimates has been simplified duly saving several man months of unproductive time which otherwise the field officials would have had to spend in the process. Use of this solution enabled the state to reduce the overall administrative cost.

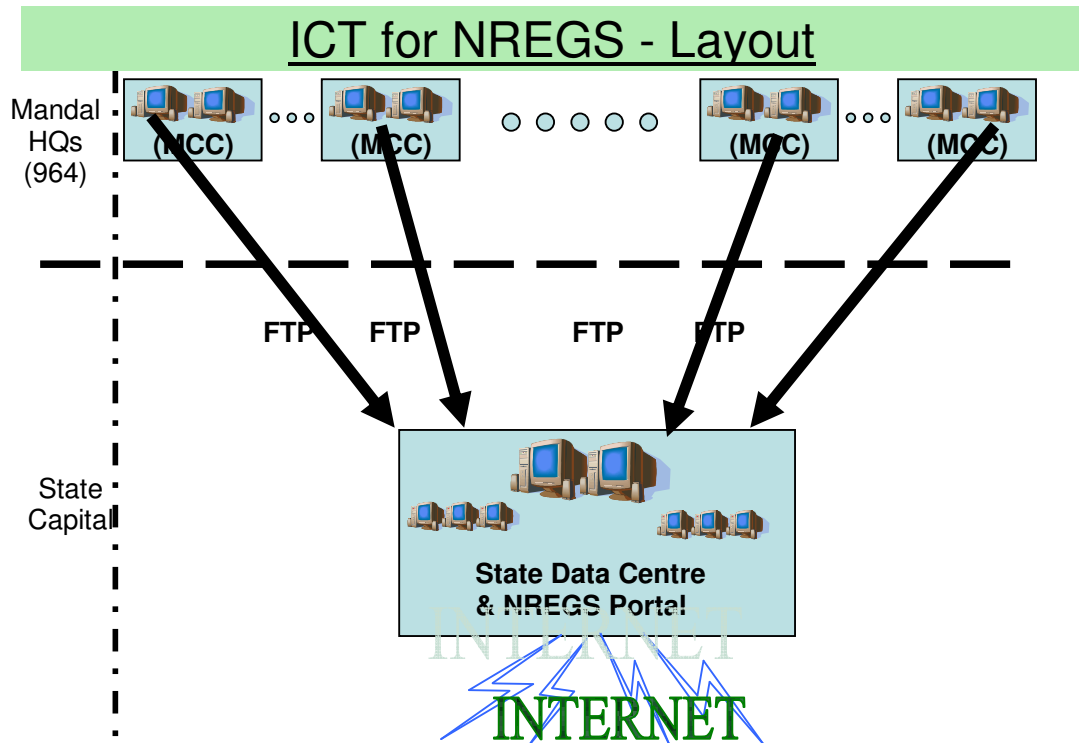
Shelf of works: the sanctioning limits to AE/ DEE have been enhanced to give quick sanctions and sufficient works are kept ready to meet the demand for work

Wages: customised measurements sheets and musters with unique IDs taken for calculating wages based on internal formulae. So, uniform implementation all over the state.

Payments: pay orders with cheque are sent to post office accounts.

Accounting: Every rupee expended to be accounted in the software thus reducing the time and effort for auditing. Bank reconciliation is also taken care. Thus services through this system are invaluable

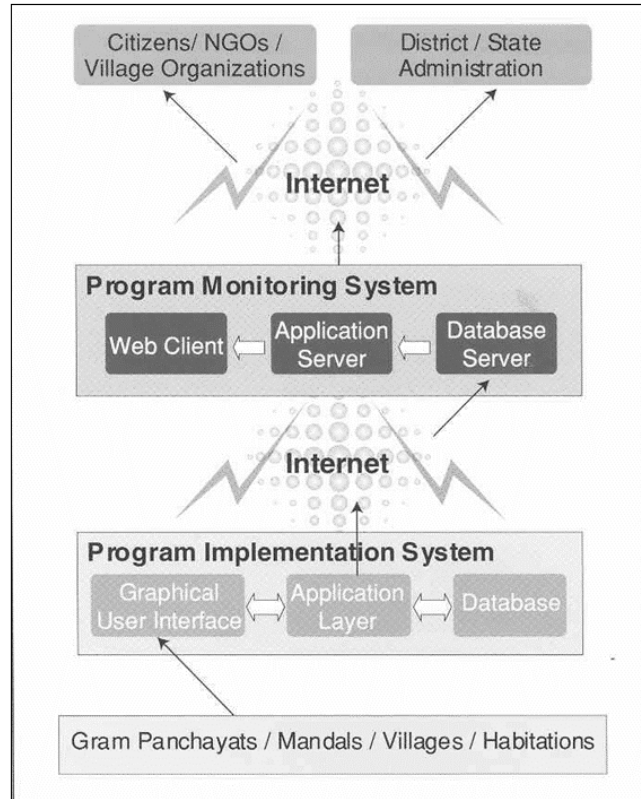
8. Layout of the System



9. Technologies used in the Project

The solution has two components:-

- Program Implementation system
- Program Monitoring System



10. Program Implementation System The program implementation system is a stand alone SW developed on Microsoft platform to implement the program at Gram Panchayat or intermediary Panchayat. All the program transactions related the execution of the program is performed on this system. Transactional data can be uploaded to the state level data centre through various means WAN, dial-up or physical media depending on the availability of connectivity.

11. Technologies

- Windows based software
- Dot Net framework, C# language
- MSDE data base
- Baraha Telugu language tool



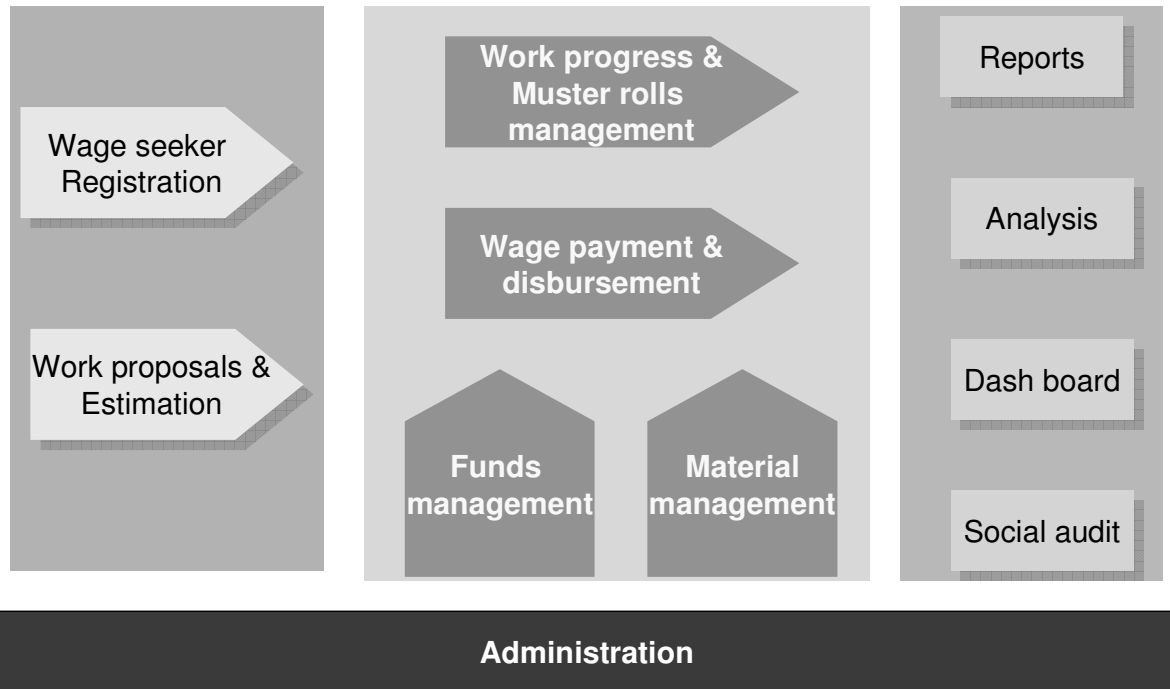
Program Monitoring System

This system consists of a data centre, which does consolidation of the entire states NREGA transaction information and a portal, which provides a consolidated view of the entire program information. This enables progress tracking, monitoring and social audit.

Technologies

- Web Application using J2EE, JSP
- Database : Oracle 10 g
- Baraha Telugu language

Modularity: Entire system has been functionally divided into the modules shown in the diagrams given below. The design has been done using OOAD and the classes delineated for easy maintenance



12. Milestones

The aim is to have a positive implementation of the scheme by:

- Enrolment of Wage seeker through speedy registration.
- Management of shelf of Works i.e., Preparation of estimates and technical sanctions.
- Monitoring of Work through M Books and musters.
- Management of Wages and Material payments ensuring accuracy and timeliness.
- Management of funds for transparency.
- Facilitating Social Audit.

The above milestones have been reached through the implementation of the e-Gov Project wherein all key processes are captured through work flows.

13. Project Management Structure

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Name(s)	Area of responsibility	Contributions
K Raju, Prl Secy, Dept of RD, GoAP	Over all supervision	Inspiration, Support and guidance at all stages
A. Santhi Kumari, CRD, DRD,GOAP	Business Sponsor	<ul style="list-style-type: none"> • Budget support • Resolving escalated issues as needed • Overall monitoring
Dr. M. Padma	Officer in Charge of Project (from GoAP)	Responsible for the e-Gov project at all stages Dovetailing ICT solutions into the processes of scheme
A. Murali, Director, EGS	In charge of implementing the NREGS in AP	Conveying the -policy decisions taken on the scheme and the processes involved. Providing domain knowledge on work estimates and execution. Ensuring implementation support to the project at all stages.
Col S S Rao, Programme Director, TCS	Officer in Charge of Project (from TCS)	Responsible for the entire TCS project team
Sharat Chandra	TCS Project Manager	<ul style="list-style-type: none"> • Secures resources • Manages the day-to-day activities of the project • Plans and manages Data center operational support and documents for the project • Brings issues and change requests to the attention of the steering committee or TCS Program Director where appropriate • Ensures that project requirements are gathered, documented, approved and managed

Further the contributions as per the area of responsibility is given below

Area of responsibility	Name(s)	Roles and Responsibilities
Project Steering Committee	Dr. M. Padma A. Murali Col S S Rao	<ul style="list-style-type: none"> • Monitors status • Resolves issues on a timely basis • Represents DRDGOAP or business area and ensures participation to support the project
Change Control Board	Dr. M. Padma A. Murali Col S S Rao Sharat Chandra Vidyasagar	<ul style="list-style-type: none"> • Represents project stakeholders in reviewing change request materials, determining the disposition of change requests and supporting the Project Manager in the implementation of their decision according to the DRDGOAP change control process
DRDGOAP Business Representative	Dr. M. Padma A. Murali	<ul style="list-style-type: none"> • Makes business decisions • Approves Work Products • Manages Requirements • Manages issue/change requests • Brings issues and change requests to the Steering Committee when appropriate
Business User Reviewer	Dr. M. Padma A. Murali	<ul style="list-style-type: none"> • Reviews project deliverables and gives input on project decisions as requested by the project manager

14. Implementation

- *Strategy for Pilot to roll out:* The pilot was run for 3 months and the entire solution was taken to scale while implementing the NREGS-Ap scheme in Andhra Pradesh. So the scheme was implemented with the software solution imbued into its processes.
- *Capacity building: Governance structure, Project management teams, Exit management team, Change management and training*
Project Policy level 4 officers

Project Management: one officer of Joint commissioner rank kept in charge of the project. 10 to 12 domain experts give inputs for developing the software. (Profiles are given separately.). From TCS side exclusive team with Programme Manager and Programme Director provide the services

Domain experts:

1. Dr Thirupathiah, IFS, Spl Commissioner (Development) O/o CRD	HRM & Capacity building
2. Mr Srinivas Raju, Jt Commissioner, O/o CRD	Affixing photos on job cards connectivity for MCC (Mandal Computer Centre)
3. Ms Anitha Ramchandran, Director, SHG, O/o CRD	Customising the NREGS to AP and operational guidelines
4. Ms K Nirmala, Jt Commissioner, O/o CRD	Plantations, Horticulture & Bio diesel works' estimates
5. Ms V.Karuna, Director, SPIU, Dept of RD, GoAP	Social audit concepts and related MIS reports
6. Mr Kishan Das, Jt Commissioner, O/o CRD –	Watersheds concepts and planning
7. Mr Rajesham, Jt Commissioner, O/o CRD (Former)	Job Cards design
8. Mr Madhav Rao, Jt Commissioner, O/o CRD	All forms and registers needed in the field for flow of information to MCC
9. Ms Gayatri Kalia, OSD, EGS—Accounts	Accounts and auditing
10. Mr Sudhakar. Programme Manager (tech) , EGS	General Works estimates and execution module
11. Rajendra Prasad, Programme Manager(MIS), EGS	MIS Reports

Change Management: 5 Computer DRPs (District Resource persons) per District and the state level team of Special Officers @ 1 per District

15. Evaluation and Measurement

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The intangible returns - like speedy generation of estimates for keeping the shelf of works ready, the timely pay orders for wage seekers and system generated reports that enable the field staff to concentrate more on quality checking rather than preparing reports and the key personnel to take decisions -outweigh the investment. Average user time savings in using the Govt. services as compared to the previous system is Job cards- 3 min per card, Estimates-5 min per estimate. Pay order- 15 min per work. Average user cost savings in using the Govt. services as compared to the previous system is estimated to be at least 30% of the overall outlay in terms of prevented leakage of funds and savings in time and effort as mentioned above.

The existing items of work or processes are tackled in an innovative way thus improving the delivery mechanism

Sl no	Item of work / process	Improvement	Result
1	Job cards	Basic information captured and job cards with unique ID printed. Photos taken from Ration card IRIS data base of civil supplies Dept.	Speed in delivering job cards. Unique ID to track all events relating to the Household. Inexpensive photo capture. Link with the biometric ration card database for any future integration.
2	Estimates	Templates are developed for each work. Simple measurements taken from ground. Internal formulae and calculations used to generate estimates.	Common methodology and common rates (Rural SSR) for generating estimates. Less than 5 minutes to generate a complex estimate. Proper validations and inability to change rates at local level

			make them tamper proof.
4	Measurement & muster	Customised measurement sheet and material supply sheet. The muster ID is associated with the work.	Recording the measurement made easy even for an X class pass. The muster association gives the accountability.
5.	Pay orders	Through internal calculation of out turn and attendance for a group pay order is generated.	Accurate wages and speed in getting a pay order.
6	Equal wages among men and women.	Amount distributed equally in a group	Individual accounts also help in ensuring equal wages. Reach the women.
7	Lack of information	Pay slips containing details of out turn, no of days worked, total no. in group etc are printed along with pay order.	As wage seekers do not have access to internet, these pay slips give them the required details.
8	Wasteful expenditure	Entire expenditure details to be entered in software	Helped in tracking unnecessary expenditure and taking remedial measures
9	Exaggerated reports	All reports are captured from the transactional work flows.	As these reports touch the ground reality they are very useful for reviewing and corrective measures. Best decision support system is established.

16. Issues and their solutions

Critical success factors

- a. All Stakeholders' acceptance, change management and exclusive team with an officer having earlier experience in 'e-Gov' projects to coordinate.
- b. Capacity building of all stakeholders especially that of actual implementing personnel at mandal.
- c. All manual forms of reporting stopped. Review only through web reports
- d. Immediate changes in software corresponding to feedback or any changes in policies and processes.
- e. Software workflows part of scheme's processes to avoid manual switch over.

Failure factors

- f. Earlier method of implementation through manual processes being more comfortable to at least certain stakeholders
- g. The constant training of the mandal staff.
- h. Manual system of reporting
- i. Meeting the change requirement demands of different stakeholders
- j. The geographical spread of the project involving initially 13 Districts.

But the failure factors were tackled in the initial stages itself.

17. Replication in other states

As this project is computerising the processes in the Government of India Act (NREGA), it is common to all the States in India. So with a local language interface and little customization this project can be used any where in India dealing with such land activities.

Road ahead

The software is extended to other Rural Development programme in Andhra Pradesh like watersheds and Comprehensive Land Development (CLDP) programmes. Now the integrated software is called Rastra Grameena Abhivridhi Samacharam (RAGAS).

18. Status and results

Present status

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The software is being implemented in 19 Districts covering 964 mandals

Report as on Date 22. 08. 2007

Total No of Districts under EGS		19	
Total No of Mandals		964	
Total No of Gram-panchayats		19323	
Total No of Habitations		64030	
Total No of Job cards Issued		65,02,683	
Total No of Adult members enrolled in Job cards Issued		1,47,04,949	
		Financial Year of 2007-2008	Cumulative Since Inception
Wage Employment Demanded	Household (Nos)	22,55,486	32,41,290
	Individual (Nos)	33,68,746	49,66,798
Works administratively Sanctioned	Number	5,47,101	6,40,202
	Value-(Rs in Lakhs)	53,37,29.87	58,79,33.35
Works in progress	Number	2,56,738	-
	Value-(Rs in Lakhs)	27,70,13.68	-
Total No of Works Completed	Number	22,134	1,15,235
	Value-(Rs in Lakhs)	1,20,64.64	6,62,68.12
Total Expenditure	Wages (Rs in Lakhs)	4,93,04.40	10,82,50.44
	Material and Skilled Wages (Rs in Lakhs)	74,97.00	86,00.15

	Contingency (Rs in Lakhs)	36,61.18	88,60.28
	Total (Rs in Lakhs)	6,04,62.57	12,57,10.87
Wage Employment Provided	Household (Nos)	22,55,486	32,41,290
	Individual (Nos)	33,68,746	49,66,798
	Men (Nos)	15,44,469	22,96,580
	Women (Nos)	18,24,277	26,70,218
	Disabled (Nos)	24,120	35,352
Total No of Person days generated		5,98,07,624	13,29,00,168
Average Wage rate per day per person (Rs.)		82.44	81.45
Average No of days employment provided per Household		26.52	-
Total No of Households completed 100 Days of Wage Employment		46,141	1,26,398
Labour Vs Material (%)		86.91	13.09
		92.72	7.28

19. Specific achievements during the year 2006-07

- Transparency in all EGS transactions
- Job Card data: 52,58,758 job cards are issued.
- Shelf of Works: 1,96,338 no of works worth 1,71,439.46 lakhs are available in shelf
- Works Execution: 93,101 no. of works are completed 1,97,520 no. of works are in progress
- Payment of wages. 58901.47 amount is paid as wages to 34,08,345 wage seekers of 23,26,138 Households
- De-mystification of works estimation process. 4,86,959 works are estimated and have got administrative and

technical sanction.

Demand Satisfaction 23,26,138 wage seekers demanded for work and are given work

Minimum wage – Average wage is 80.67 When State level average wage rate fell below Rs 80 in the months of February and March 2007 rates of certain tasks were enhanced in Rural SSR. So the information is extensively being used as effective decision support system.

Timely Payment of Wages: Out of 4,77,417 payments made 56.87% of payments are made before 15 days. So for delayed payments, circular instructions were given indicating the time schedule to be followed for all the tasks preceding payment to wage seeker

Equal wages: 1809173 women got employment as against 1598953 of men and their wage is 32314.23 lakhs as against 26584.8 lakhs that men got as wage.

Transparency in payments --- muster level payments are available for viewing. For transparency, in pay slips number of wage seekers in the group is mentioned to avoid bogus entries

Facilitating Social Audit and Right to Information. Separate social audit reports enable any stakeholder to verify with ground position.

The guilty have been pulled out and punished

- Robust Accountability Mechanism
- Individual
- Institutional

Details of implementing personnel and officials are logged into the system increasing the accountability.

Comprehensive Web-based monitoring and review mechanism as an effective decision support system. All the EGS transactions are

reviewed only through web reports. Feedback from all the stakeholders is improving the software and the website.

Future plans for readers seeking more information on project

They can browse website www.rd.ap.gov.in or <http://nrega.ap.gov.in> or email to directoregs@yahoo.co.in or comm_rd@ap.gov.in.
