Agricultural Activities in Marginalized Rural Areas using authentication technique

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Abstract: Marginalized Rural Areas (MRAs) execute farming and in most cases that can lack of basic resources and skills to improve yields, which are often poor in detail. This has led to famine the system, poverty, crime and rural to urban migration system. Agricultural activities set when practiced very well can alleviate such challenges in the country. We are therefore, developing a cloud computing system that seeks to improve agriculture as an activity in MRAs. It shall include the cloud architecture which is a Mobile information system and would be used by the farmers based on farmers report to share information about the farming techniques, markets, weather, seeds and probable information. In this paper, we existing system to findings of a before system study of what common mobile devices are mostly used and what type of agriculture is mostly executed by MRAs people. We collected data through system data storage point that were given to farmers in different villages in vizag, vizianagaram, srikakulam and east Godavari and west Godavari of Andhra Pradesh located in India. We propose authentication providing to existing system and improve the performance of network and most of the data send securely.

I.   INTRODUCTION

According to the United Nations, almost 50% of world population and more than 70% of the developing countries are living in rural areas. These areas are marginalized. They lack critical services that are offered in urban areas [1]. They often rear cattle and practice subsistence farming for consumption. However, agriculture in Marginalized Rural Areas (MRAs) of South Africa are not effective due to lack of resources and support from other farmers who seem to be successful and productive more especially large scale farmers. Farmers in MRAs suffer from low yields, lack of resources may be possible ways, skills its required, death of cattle due to diseases thus making MRAs farmers not to be productive at all. Nowadays MRAs farmers are migrating from rural areas to urban places due to lack of resources and the scarcity of food at marginalized rural areas. In South Africa, farmers from MRAs also face challenges regarding availability of information on how to mitigate these challenges they face in MRAs. It is very expensive to access such information about diseases, crop pests, and fertilizers and sometimes the information is not available, credible and accurate. All these challenges are as results of not having enough Information and Communication Technology tools for farmers to share information amongst each other.

These challenges have also led to poverty and high crime rate in MRAs of South Africa. Agriculture is the backbone of South African economy. Therefore,

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farmers from MRAs should be supported with latest technologies of practicing farming in order to alleviate the challenges they face. These technologies are available in the form of information, which can be gotten through internet. Some of these can be gotten by sharing information amongst the farmers of which cloud computing can be the best technology of providing such a platform. Cloud computing is using the internet to deliver technology supported services to the people and organizations [2]. Cloud computing has emerged over the past years and became the most common and helpful source of information between partners and people who are needy of information.

1.1 Agriculture in marginalized rural areas:

MRAs are those areas that are without access to ordinary public services such as water level and sanitation and are without a formal local authority scheme [3].

The main characteristics of MRAs include [4]:

1) Broken municipal service delivery.

2) Communities living in these areas typically suffer from high levels of poverty and low levels of economic opportunities.

3) People live in dispersed settlements in traditional dwelling structures on communal lands.

4) Contain few social, physical or economic support amenities; people have access to neither library and information services or public services like ICT facilities such as computers, internet or email.

5) Lack of infrastructure, i.e., electricity, tap water, etc.

Agriculture, also termed as farming is the growing and maintaining of animals and crops for food and fiber to sustain and improve human life. Agriculture is fundamental to the sustenance of life which on its own, constitute a bed rock of economic development of nations, especially in ensuring food security, which is vital for human development and essential raw materials, which is necessary for industrial

production. That is why agriculture is the main source of food for all people in the world. There are two types of agriculture that are mostly practiced in South Africa, which are commercial and subsistence. Commercial agriculture is where the farmer produces goods intending to sell them. These goods can be sold to wholesalers or retail outlets. Subsistence agriculture is where the farmer only grows the individual level or produces enough to feed his or her family, it can be crops or livestock, e.g., a family has only one cow to give milk for one family, a farmer grows only enough wheat to make bread for his or her family.

1.2 Despite this, mobile cloud computing still suffers from the following limitations [5]:

1) Battery capacity limits.

2) Less memory.

3) Less computing power.

4) Storage limitation.

5) Bandwidth limitation.

Mobile cloud computing offers mobile users with data storage and processing services in clouds, removing the need to have a powerful device configuration as all resources demands computing can take place in a cloud.

1.3 The main advantages of Mobile Cloud Computing include [6]:

1) **Extending battery lifetime** – a mobile phone battery life is small it cannot handle big simultaneous processes. But with the introduction of cloud, it is no longer mobile devices responsibly for large processes but the servers in the Cloud.

2)**Improving data storage** – storage capacity of phones it's not as big as to contain huge information and files, but cloud makes it no longer mobile devices responsible for storing large amount of data but servers in the Cloud.

3) **Processing power** - helps reduce the running cost for computation intensive applications.

4) Saves Time - The time consumed or wasted while travelling from different locations or to the office and back, has been injure. One can now access all the important documents and files over a secure channel or portal and work as if they were on their computer. It has upgraded telecommuting in many companies. It has also reduced unnecessary incurred expenses.

5) Enhanced Productivity- Users can work efficiently and effectively from whichever location they find pleasant. This in turn enlarges their productivity level.

6) Ease of Research Research - has been made easier, since users preceding were required to go to the field and search for facts and grain them back into the system. It has also invented it easier for field officers and researchers to collect and feed data from wherever they are without making unwary trips to and from the office to the field.

7) Entertainment - Video and audio recordings can now be flood on-the-go using mobile computing. It's easy to access a wide variety of movies, educational and descriptive material. With the progressed and availability of high speed data connections at considerably cost, one is able to get all the entertainment they want as they browse the internet for flooded data. One is able to watch news, movies, and documentaries among other entertainment offers over the internet. This was not possible before mobile computing appeared on the computing world.

8) Streamlining of Business Processes- Business processes are now easily available through protected connections. Looking into security issues, tolerable measures have been put in place to ensure authentication and approval of the user accessing the services. Some business functions can be run over secure links and sharing of information between business associates can also take place. Meetings, seminars and other informative services can be organized using video and voice conferencing. Travel time and expenditure is also somewhat reduced.

II.   RELATED WORK

2.1 Cloud computing for rural ICT development: FIRDHOUS, M., GHAZALI, O. & HASSAN, S

Description: According to the United Nations, almost 50 percent of world population and more than 70 percent of that of developing countries are living in rural areas. Majority of this population live in poverty especially in North and sub Saharan Africa. Rural population face unique problems compared to their urban counterparts in terms of access to technologies, infrastructure, markets and social services. Experts have identified ICT as the tool for overcoming the inefficiencies in traditional methods for the empowered of rural masses. In this paper, we study how cloud computing can be used to meet the ICT requirements for rural development in terms of opportunities and challenges of implementing and using new technology [7].

2.2 Security threats in cloud computing: SHAIKH, F. B. & HAIDER, S

Description: Cloud computing is an internet based pay as use service which provides three layered services (Software as a Service, Platform as a Service and Infrastructure as a Service) to its consumers on demand. These on demand service facilities provide to its consumers in multitenant environment but as facility increases complexity and security problems also increase. Here all the resources are at one place in data centers. Cloud uses public and private APIs (Application Programming Interface) to provide services to its consumers in multitenant environment. In this environment Distributed Denial of Service attack (DDOS), especially HTTP, XML or REST based DDOS attacks may be very dangerous and may provide very harmful effects for availability of services and all consumers will get affected at the

same time. One other reason is that because the cloud computing users make their request in XML then send this request using HTTP protocol. So the threaten coming from distributed attacks are more and easy to implement by the attacker, but to security expert very difficult to resolve. So to resolve these attacks this paper introduces an approach for security services called filtering. The filter is used to detect and resolve XML and HTTP DDOS attack [8].

2.3 Information accessibility by the marginalized communities in South Africa and the role of libraries: OCHOLLA

Description: This paper discusses the nature and levels of information access by the information deprived communities in South Africa and the role libraries play in supporting information access to the information poor. The marginalized communities and information access are defined, and how, why and where such communities access information is discussed. The library system in South Africa is described and its role, activities, programmers and services examined. The paper further discusses how the libraries are resourced and managed, and the challenges and opportunities they face. An attempt is made to compare South African library model support to the information poor communities with those of other countries of the region. It is concluded that South Africa has a strong information access capacity and library services, though comparatively better than those in other African countries in terms of management, resource support and distribution, but still lacks the capacity for effective information provision to the marginalized communities largely because of their location and information content and format that is largely in favor of information rich environments [9].

III.METHODOLOGY

In order to ascertain how farming is practiced in Pongola and which mobile devices are mostly used in MRAs, the most major investigation was carried out through applications. We created paper based questionnaire, since we were conducting the study in MRAs we went there physical to clarify more on questions. The questions were both structured and unstructured questions; it was close ended questionnaires. We interviewed both farmers and farm workers. The case study was conducted in Pongola district. The sample was non-random. We were questioning the people on a willing basis.

In this system, farmers mainly focus on download or upload the information to cloud through wireless point. Here database maintains and stores into base station through server. We use system to indicate different locations of farmers stayed and it should be maintains separately. From starting of network process, farmers using the mobile devices to communicate with base transceiver or wireless access points. Once get the information from mobile device then its forward to central access point. The more information get from different devices then send to server its mainly based on data storage. Here server forwards the information to cloud through firewalls. The network mainly indicates that system how to set into network process and different data packets sending through source levels. Communication system means from farmer to cloud data how to moving and transmission levels and setup levels its completely based on genuine information.

3.1 Algorithm:

Farmer--------------------------------→mobile devices
Mobile devices--→base transceiver / wireless point
Wireless point-----------------→ central access point
Central point-------------------------------→ server

Server--→**firewall**

Firewall--------------------------------------→**cloud**

Finally ……………..data uploaded into cloud or any information need so downloaded from cloud.

Disadvantages:

1) Farmers upload or downloaded time dropping the packets
2) Server doesn't check behaviors of farmers
3) Delivery ratio less
4) Network efficiency is not good
5) Without validation information downloaded

IV. PROPOSED SYSTEM

In this project, we propose authentication provided to existing system and individual farmers report taken then form the genuine information and uploaded into cloud. Here authenticate the every member means node and security provided for every transmission based on requirement. Every farmer has worked based on path id then it can forward the genuine information. In this system, farmer every data information stored into server database and then report based on data moving only possible. In particular time interval we have to maintain in this system and we have to decrease the delay by storage level of systems, must provide authenticate for all nodes. Here mobile device usage based also data forward or not check it. Once check the mobile device storage levels and once everything is ok means then forward formation to wireless point. Once data received from device then forward to central point. Here central point measures and check the information genuine or not then send to server otherwise unnecessary information means drop the data automatically. Here protocol support also more because of data delivery or mitigate the dropping data all are depend protocol and system design.

Architecture diagram:
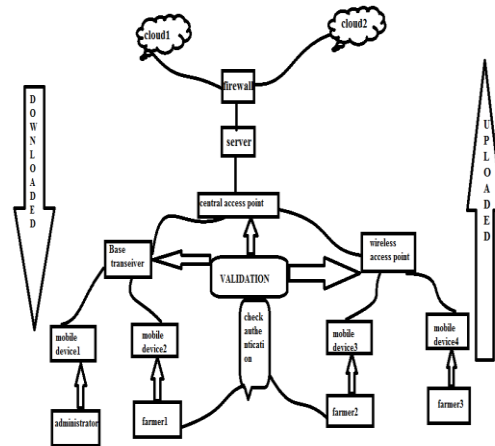
Fig1: System architecture

Description:

Farmers: In this system, farmers collect the information and uploaded to cloud database through wireless point, central point and server using mobile devices. Here farmers need any information then easily downloaded from cloud through some procedure. Farmers doesn't contact to cloud daily. It can use mobile device or not but it can mobile device means easily downloaded or uploaded. Every farmer has share the information before its check authenticate or not. Once he authenticated then easily shares the data. We collected more information about farmers through different villages throughout India. In this system, whatever stay in villages check the list of that people report, we selected unemployed members only.

Administrator: Network administrators are for making sure that computer hardware and network infrastructure related to an management network is effectively maintained. The admin main roles are:

1) Monitoring a network in every transmission

2) Testing the network for any kind of weak point based
3) Keeping an eye out for needed updates
4) Installing and implementing security programs
5) Evaluating implementing network

In this project, administrator directly contacts with mobile device because operating system based mobile and update the information. The control networks generally produce that small compared to data networks. The network must be following the small sized packets, bounded packet delay and quality packet delivery. Delay and packet dropping degrade the performance of network. So it can consume that control the routing information and set the proper routes support of controller. It can support for trace files generating, packets moving, routing information find out and secure the data. The system behaviour and protocols performance set for that permission just like a report from admin. In network, all processes done by this. The networks have been set the parameters for individual node and forward the packets through the system.

Base-transceiver/wireless point: Wireless point setting up a computer networks in a business or any other application purpose. With the creation of wireless point, network users are now able to add devices that access the network with no cables. The wireless access point normally connects directly to a Ethernet connection and the WAP then provides wireless area connections using radio frequency links established for other devices to utilize that wired connection. The WAP's are using for support a standard for sending and receiving data using the radio frequencies.

An ad-hoc network uses connection between two or more devices without using wireless access point but here wireless point role important in network. An ad-hoc network is used in situations such as quick data exchange setup easy and does not require an access point.

Central-access point: Here central access point worked as mediator connected between wireless point and server based on farmer's information passing to server through accessible by mobile devices.

Server: the network server is a computer system, which is used as the central achieving of data and various programs that are shared by users in a network. Servers can provide functionalities like as services, resources among multiple clients such as share the data through this one. Here farmer process may run same device over a network to server based on communication levels. Farmer's sends a request to the server, which performs some type of action means activity and sends a response back to the farmer typically with updates of information.

Firewalls: a firewall is a system that implements network security by filtering incoming and outgoing network traffic based on user requirements. Its mainly used for security issues and traffic setup and then measuring traffic in network routing based on requirements we set properly help of firewalls.
The protection of firewalls to network:

1) Large corporations often have very complex firewalls in place to protect for networks.
2) Firewalls can be configured to prevent farmers form sending certain types of transmitting a sensitive data outside of network.
3) There is a no limit to the variety of configurations that are possible using firewalls.

Cloud: cloud based network is focused on reduced cost, improve the efficiency and scalability. It is an

new networking paradigm for building and managing secure routing over the public internet by utilizing the global cloud infrastructure. In cloud networking, network functionionalities and services including connectivity, security, management and control. In this project, the above diagram shows that cloud infrastructure involves and updating the information through the network and its mainly helps to downloaded information for farmers and uploading the information purpose. The access of this cloud available for all users who are authenticated in network.

Validation: In this every farmer passing the information to cloud before he must authenticate otherwise doesn't do the process. Here different places of network authentic the user levels. Form mobile device to base transceiver, from wireless point to central access point and central access to server these types processing based on authenticate process by secure way using path id.

Advantages:

1) Farmers every moment observed and check behavior
2) Farmer's and farmer's details authenticated
3) Server and access points also validated
4) Network performance increases
5) Packet delivery ratio more

Simulation table:
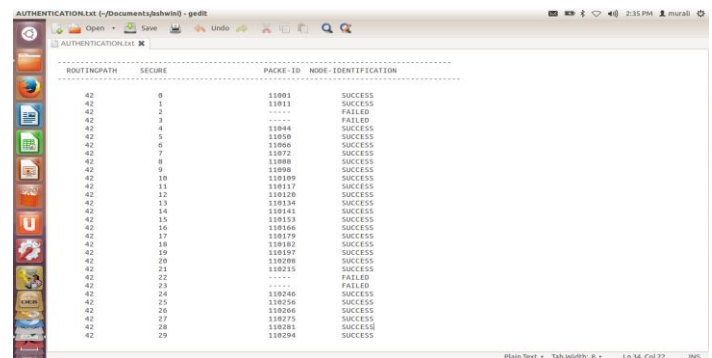
PARAMETER	VALUE
Application traffic	CBR
Transmission rate	15 packets/sec
Radio range	450m
Packet size	512 bytes

Channel data rate	15Mbps
Maximum speed	28m/s
Simulation time	16secs
Number of nodes	30
Area	1500x1500
Routing protocol	AODV
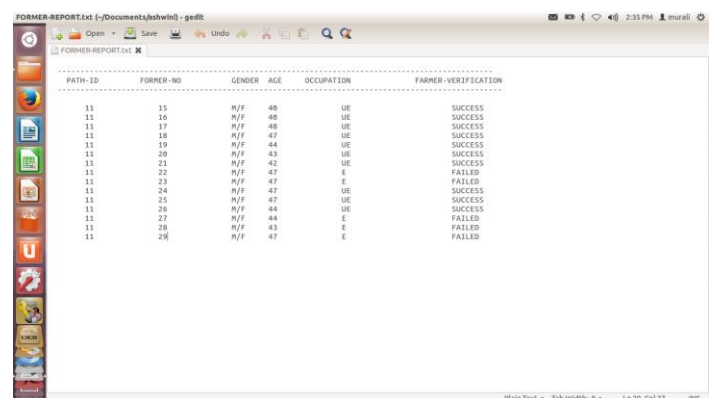
Table1: The Simulation of Network Model

V.   Result and discussion

Authentication table:
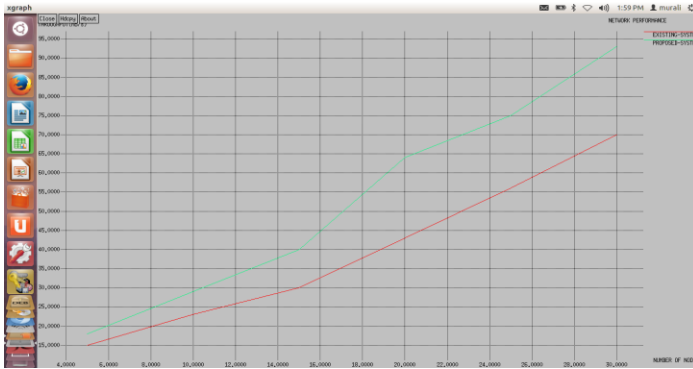

Former report table:

Execution steps:

Graphical representation:
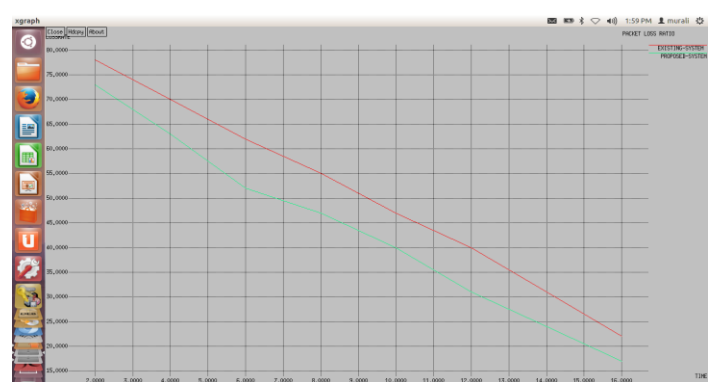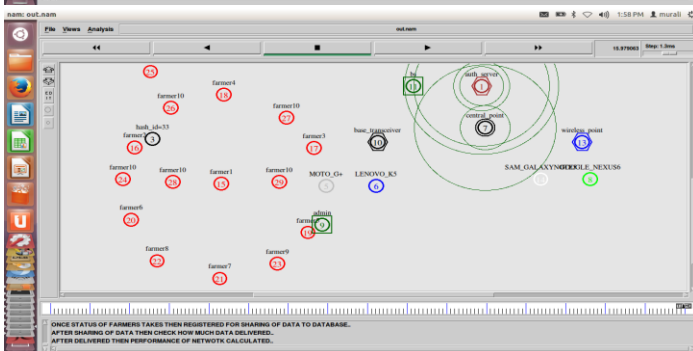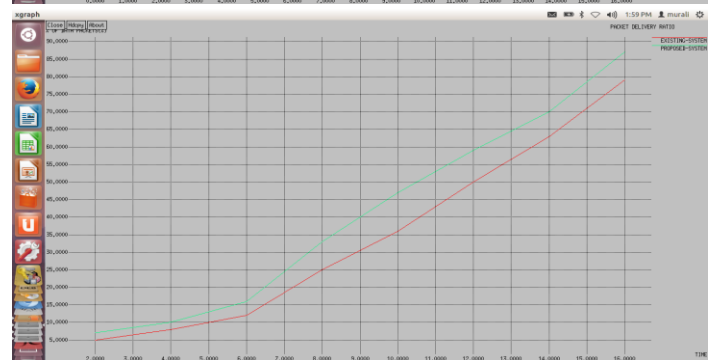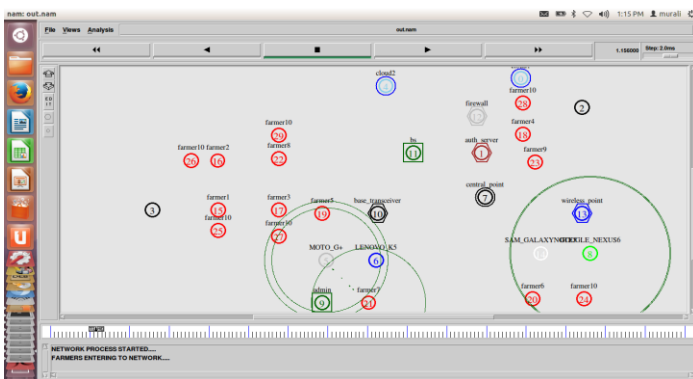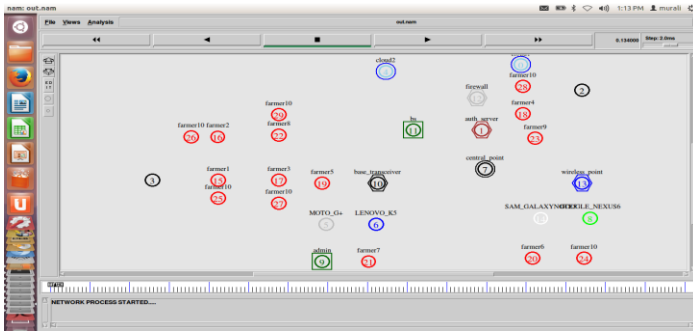
CONCLUSIONS AND FUTURE WORK

In this paper, we have implemented to identify mostly used devices in MRAs, mobile devices with access to internet and phone's that take pictures and share the information. We existing cloud computing model that augments the use of ICT to improve agriculture as an activity in marginalized rural areas will be of great help since people living in MRAs seem to be neglected. Here cloud architecture which is going to be a Mobile Information System and is going to be used by farmers to share information about the farming techniques and seeds. In this paper, we propose a system to provide authentication for mobile sharing devices and farmers then validate the information, users and user information. So we conclude that the system infrastructure has already been completed with authentication. We make out the results compare to existing proposed is more effective.

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