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STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESIS (ES)

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

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SCOPE FOR FURTHER RESEARCH

REFERENCES

APPENDIX/ANNEXURE

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- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

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MOBILE BASED DECISION SUPPORTING SYSTEM FOR WEATHER INDEX BASED CROP INSURANCE SCHEME: A CASE STUDY OF KARNATAKA'S MOBILE ONE PROJECT

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ABSTRACT

The aim of this article is to perceive a need of a Mobile Based Decision Supporting System for Weather Index Based Crop Insurance Scheme in Karnataka i.e. due to advancement of technology user can use application which is rich in Graphical User Interface (GUI) specially made for illiterate people rather than SMS Based information. As we know Karnataka government has launched M-One project, A SMS based forecast of rainfall data is provided in the form of millimeter (Min, Max, and Average) in each districts and RHR (Rather Heavy Rain), MR (Moderate Rain), LR (Light Rain), and VLR (Very Light Rain) in each user hoblis. But the requirement is, what the normal rainfall of this time is? Whether this time farmer will get less or more than normal rain? Whether the rainfall of this time which he has got comes under weather index or not? A record is required for farmer to show at the time of claim settlement for the rain which he/she has got. In this way, a information system which views what is the normal rainfall of this time, how much it has got and cross check with weather index and provides answer to the requirement in the form of Decision Supporting System. Example like: Traffic signals: yellow if more or less than normal rainfall, green is for Normal Daily Rainfall and to show program is working, red is for insurance requirement.

KEYWORDS
SMS based services, weather index based crop insurance, decision supporting system, risk under uncertainty.

JEL CODES
D81, G220.

I. INTRODUCTION
Several studies have identified opportunities for using mobile phones in the agriculture sector. A report by Vodafone and Accenture, for instance, notes that mobile phone-enabled solutions for food and agriculture could assist producers to access financial services, obtain agricultural information, improve data visibility for supply chain efficiency and enhance access to markets (Vodafone Group & Accenture 2011). The greatest potential for cost savings were seen in mobile financial payments and mobile information provision. Donner (2009) distinguishes between different livelihood functions of mobile phones, including mediated agricultural extension, market information systems, virtual markets, financial services and direct livelihood support.

Aker (2011) examines the role of mobile phones in supporting access to information about agricultural technologies and extension services. She identifies several potential mechanisms in this context, including improving access to information from private sources or through agricultural extension services; improving the management of input and output supply chains; facilitating the delivery of other services; increasing the accountability of extension services; and increasing linkages with research systems. She also notes a number of challenges associated with the use of mobiles in agricultural extension, such as the need for literacy skills and technological knowledge, the limits of mobiles to display complex information, and technical difficulties in developing voice-based systems.

In general, mobile phones can reduce information search costs, e.g. for jobs, input and output prices, or potential buyers and sellers (Aker & Mbiti 2010). In many parts of the developing world, the most common way of obtaining information remains personal travel which is costly both in terms of time and money. Other channels also have their limitations, such as newspapers (which tend to be 1concentrated in urban areas and require literacy), internet (low access) or TV and radio (limited information range and one-way communication) (Aker 2011). Thus mobile phones have the potential to not only reduce costs, but also allow for more regular and timely access to information.

II. EXAMPLES OF M-SERVICES AND MOBILE PHONE-BASED TECHNOLOGIES USED BY FARMERS
Several m-services have already been developed that deliver information to farmers either on demand or by sending updates via SMS or audio recordings. M-services may also serve to facilitate farmer-to farmer or farmer-to-buyer relations, such as sharing of experiences on farming practices and market information related to prices, supply and demand. Advice on farming practices is one of the most widely available m-service in agriculture, often as a complement to existing extension services. Some services are delivered through SMS, such as Reuters Market Light developed by the business data provider Thomson Reuters which delivers personalised information to Indian farmers.4 A more sophisticated example is iCow which combines general livestock management advice with advice for individual cows (among other functions). More often, however, such services are delivered using voice-based systems because of literacy or language barriers and the limits of SMS to convey large amounts of information. Technologies include interactive voice response systems (e.g. the government-run National Farmers Information System in Kenya or IKSL – IFFCO Kisan Sanchar Limited offered by the Indian Farmers Fertiliser Cooperative Limited and Airtel in India), helplines (e.g. IKSL) or radio programmes that respond to questions sent by mobile phones (e.g. The Organic Farmer in Kenya).M-services are also used for training and education. In India, for instance, Lifelong Learning for Farmers offers learning modules as recorded audio content delivered to women livestock producers through mobile phones (World Bank 2011). The service is provided by the Commonwealth of Learning in collaboration with the Indian non-governmental organisation VIDIYAL. The messages are recorded by VIDIYAL and women farmers and sent to participating women every morning. Another example is Nokia Life Tools operating in India which offers English learning courses through mobile phones.

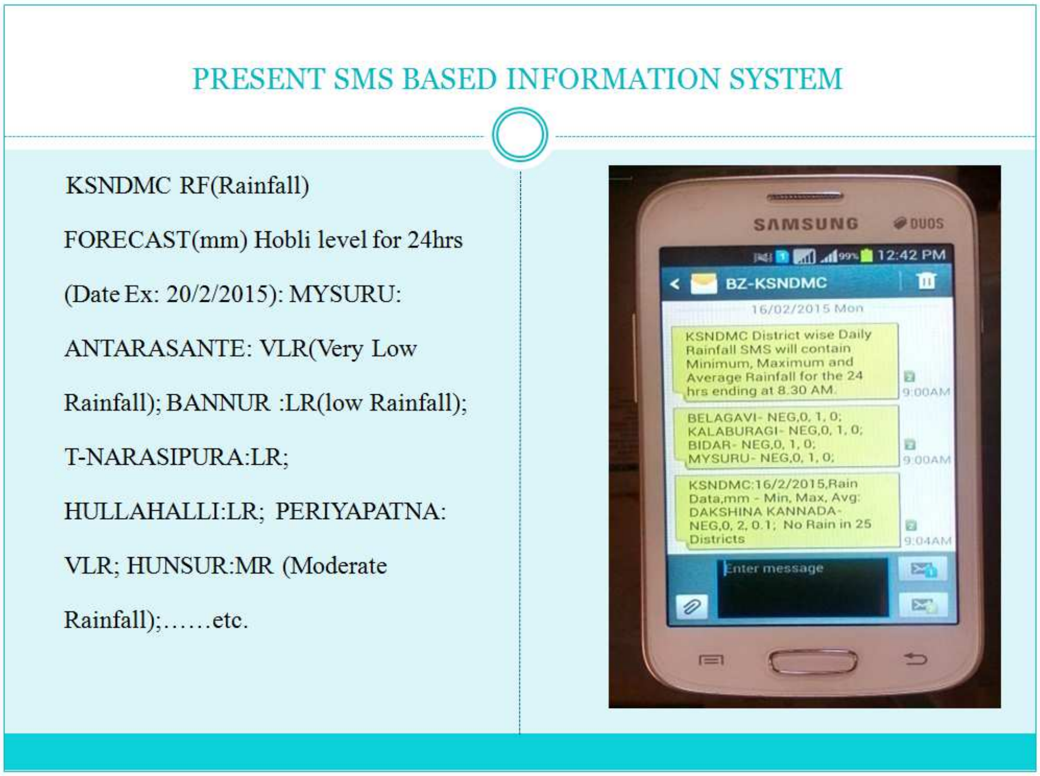
M-services are also increasingly being used as a tool to support social learning and networking. Various mobile phone-based survey applications (e.g. Frontline Forms, Episurveyor and ODK Collect) have been developed, such as Frontline Forms, Episurveyor and ODK Collect. Such services could, for instance, be used to collect data on the performance of agricultural technologies which can then be shared with other farmers. FrontlineForms, for instance, is used by the Technoserve Coffee Initiative in Tanzania to evaluate the impact of training on farmers' behaviour and yield changes (Oyenuga 2011). Data collection is also offered through the Community Knowledge Worker (CKW) programme in Uganda which gathers data from farmers by sending them questions via SMS or by designing mobile surveys through ODK Collect which are then carried out by CKW staff.

There are also examples where mobile phone-based technologies are used to facilitate interaction and learning among farmers. Sauti ya wakulima (The Voice of the Farmers) in Tanzania, for instance, is a collaborative knowledge base created by a small group of farmers who share two smartphones with GPS to publish images and voice recordings about their farming practices on the internet. Another example is CocoaLink in Ghana which uses voice calls and SMS to connect farmers to each other and to experts at the Ghana Cocoa Board (finanzen.net 2011).Several m-services also provide information that help farmers to better access and manage risk related to weather events and diseases. Weather information is often combined with other types of information that is regularly disseminated to farmers (e.g. Nokia Life Tools in India or Esoko in Ghana) or can be requested via SMS (e.g. Google SMS in Uganda). There are also some dedicated weather information services. For instance, the government-run Radio and Internet for the Communication of Hydro-Meteorological Information (RANET) project in Zambia collects weather data from farmers (sent by SMS) and satellites and disseminates information on extreme weather events and seasonal climatic information to farmers via SMS (Mumbi & Ghazi 2011).

Mobile phone-enabled technologies are also used to monitor and disseminate information about crop disease outbreak. The Digital Early Warning Network in Tanzania, for example, receives information about cassava disease outbreaks from farmers via SMS (Ndyetabula & Legg 2011). The resulting maps are then used to focus mitigation efforts in affected areas. In Uganda, Makerere University in collaboration with the National Crops Resources Research Institute and the University of British Columbia is trialing a system to monitor cassava crop disease outbreaks using camera phones with GPS. Maps showing disease outbreaks area then displayed on a website (Heike Baumuller2012).

III. PRESENT SMS BASED INFORMATION SYSTEM

EXHIBIT 1



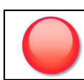
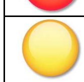
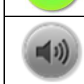
IV. PROPOSED DECISION SUPPORTING SYSTEM

In Present Information System, we get SMS based forecast of Daily Rainfall in the form of Min, Max, and Average (in mm) and Rather Heavy Rain (RHR), Moderate Rain (MR), Light Rain (LR), Very Light Rain (VLR) for scale in Districts and Hoblies, This may not possible to understand for everybody especially for rural farmer because some are illiterate, some are usually uses local language, and information is used in this method are coded words Example: LR, VLR, MR……etc. this is not giving us a precise information about it so the authors want to perceive a need of a Mobile Based Decision Supporting System for Weather Index Based Crop Insurance scheme in Karnataka i.e. due to advancement of technology user can use application which is rich in Graphical User Interface (GUI) specially made for illiterate people rather than SMS Based information to the government of Karnataka as well as Weather Index Based Crop Insurance Companies. In this way, the authors are proposing a model.

The following are the GUI, Algorithm, and Flowchart of proposed model

Graphical User Interface of Proposed Model

EXHIBIT 1

	Blinking Red Light: Insurance Needs
	Blinking Yellow Light: Check for Water levels
	Blinking Green Light: Normal Daily Rainfall and to show program is working
	*Voice/Sound

Special features of this method are

1. Simple Graphical User Interface (GUI) that can be understandable by everybody.
2. No need of Internet.

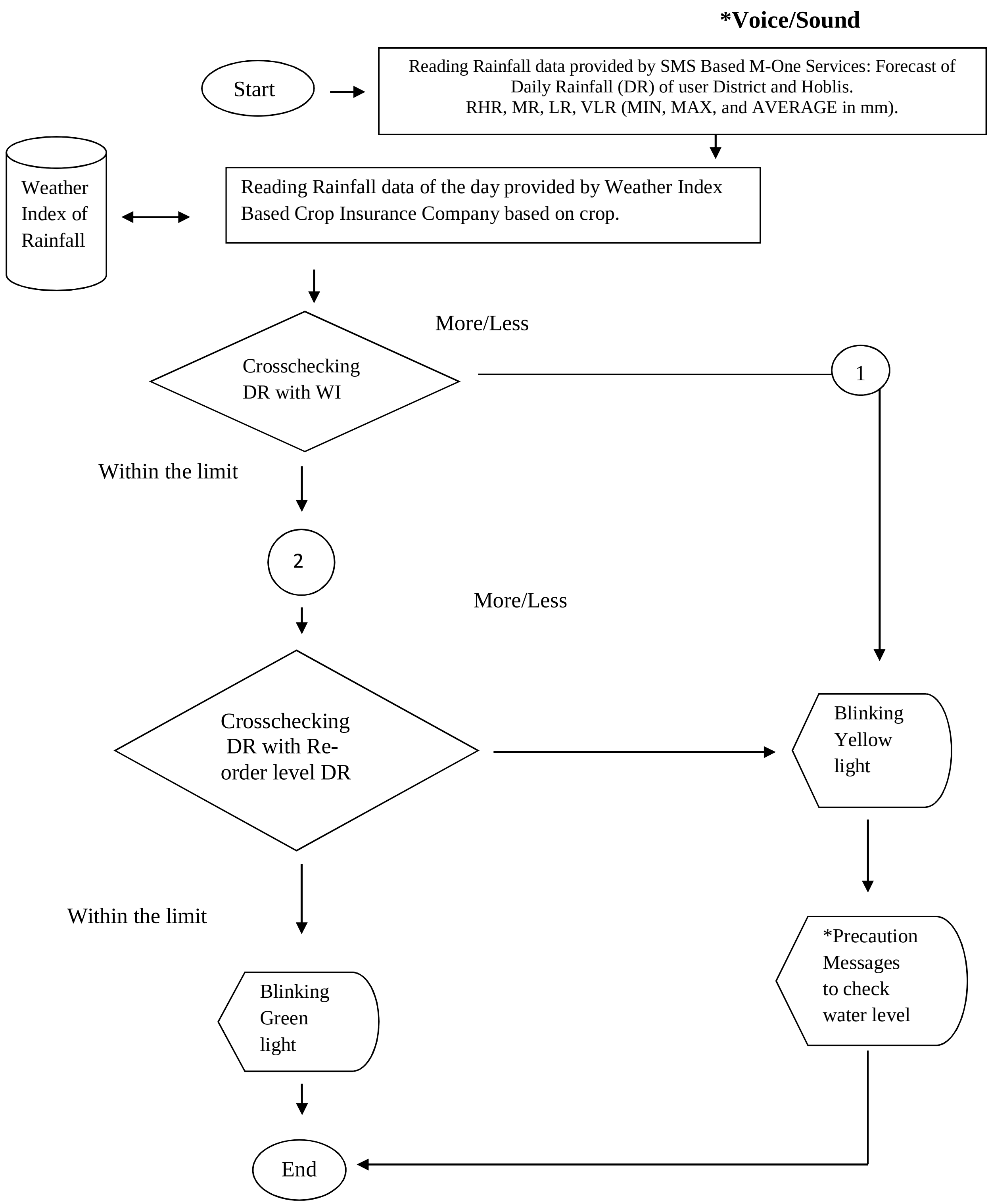
3. Cost effective/free.
4. Useful for Insured, Not insured, and Weather Index Based Crop Insurance Company.
5. Record is maintained in farmer as well as Insurance Company it brings transparency.
6. Water Re-order level management will be easier.

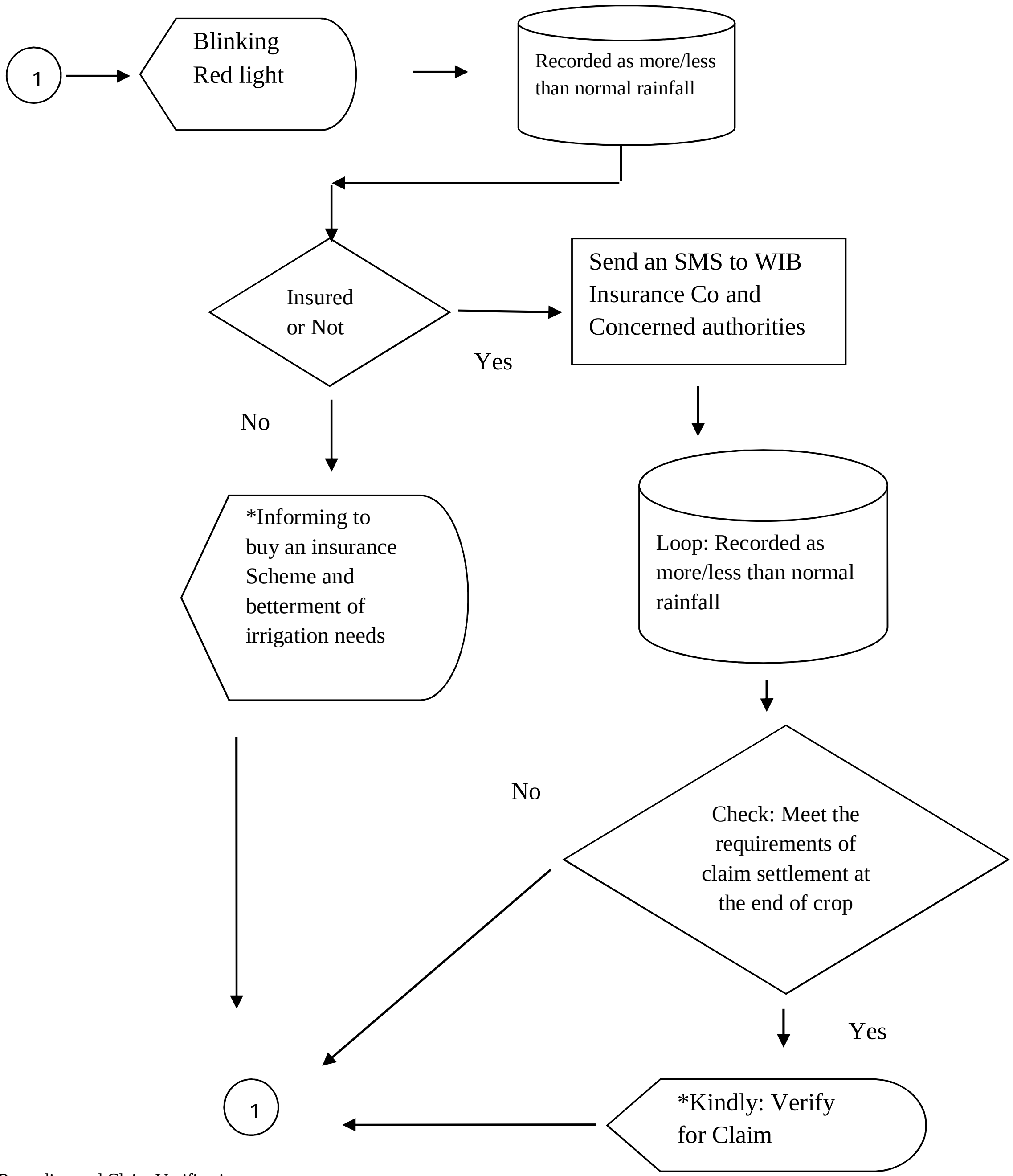
V. ALGORITHM

Step 1: Starting the program by inputting Username and Password for Authentication.
Step 2: Reading the Rainfall data provided by SMS Based M-One Services: Forecast of Daily Rainfall (DR) of user District and Hoblis.
Examples: BANNUR: LR (low Rainfall); HAVERI- NEG,0,2,0;
KSNDMC: (Date Ex: 20/2/2015), Rain Data, mm – Min, Max, Avg: BIDAR – NEG,0,2,0;MYSURU – NEG,0,1,0; CHIKKAMAGALURU – ISO,0,32,2.5; BELAGAVI - NEG,0,2,0;CHIKKABALLAPURA - NEG,0,2,0;HAVERI- NEG,0,2,0;KALABURAGI- NEG,0,2,0;…etc
KSNDMC RF(Rainfall) FORECAST(mm) Hobli level for 24hrs (Date Ex: 20/2/2015): MYSURU: ANTARASANTE: VLR(Very Low Rainfall); BANNUR :LR(low Rainfall); T-NARASIPURA:LR; HULLAHALLI:LR; PERIYAPATNA: VLR; HUNSUR:MR (Moderate Rainfall);……etc.
KSNDMC RF (Rainfall) FORECAST(mm) Hobli level for 24hrs (Date Ex: 20/2/2015): MYSURU: No Rain in all Hoblis;
Scale:
Very light Rain (>= 0.5mm to < 2.5mm)
Light Rain (>= 2.5mm to < 7.5mm)
Moderate Rain (>= 7.5mm to < 35.5mm)
Rather Heavy Rain (>= 35.5mm to < 64.5mm)
Step 3: Recording of Daily Rainfall data and reading Rainfall data of the day provided by Weather Index Based Crop Insurance Company based on crop specification.
Step 4: Crosschecking Daily Rainfall with normal and abnormal range of rainfall provided by Weather Index Based Crop Insurance Company.
Example:
(a) If an average daily rainfall of a certain place is MIN is zero (mm) and MAX is 3(mm) fixed by Weather Index Based Crop Insurance Company based on crop specification.(stored in database)
(b) If that day rain is more than 3(mm) AVG than it is abnormal rainfall.
Step 4.1: IF yes (in abnormal range): Blinking Red Light will be displayed on main window of mobile
Step 4.1.1: Recording of data and asking the query whether you are insured or not
Step 4.1.2: IF yes (Insured) Send an SMS to WIB Insurance Co and Concerned authorities
Step 4.1.2.1: Adding Daily Record
Step 4.1.2.2: Check: Meet the requirements of claim settlement at the end of the period of crop.
Step 4.1.2.2: IF yes Message will be displayed to verify claims with sound
Step 4.1.2.2: IF no Step 4.1.3 Continued….
Step 4.1.3: IF no (Not Insured) Informing to buy an insurance Scheme and Betterment of irrigation needs
Step 4.1.4: Precaution Messages will be displayed on mobile main screen to check water level with sound
Step 4.1.5: Blinking Yellow Light will be displayed on main window of mobile.
Step 4.1.6: End of program.
Step 4.2: IF no (in normal range) Step 5 continued…
Step 5: Reading ADR from database ADR = Average Daily Rainfall (Average of last 10 years)
Step 6: Calculating: Re-order levels based on Water Levels required for the land
Fixing: Maximum re-order level =MaxADR
Fixing: Minimum re-order level =MinADR
Re-order level DR = Between MaxADR and MinADR
Step 7: Crosschecking Daily Rainfall with Re-order level Daily Rainfall
Step 8.1: IF yes (More OR Less than Re-order Levels): Blinking Yellow Light will be displayed on main window of mobile.
Step 8.1.1: Precaution Messages will be displayed on mobile main screen to check water level with sound
Step 8.1.2: End of program
Step 8.2: IF no (Within Re-order Level) Step 9 continued…
Step 9: Blinking Green Light will be displayed on main window of mobile to ensure normal water level and program is working.
Step 10: End of program

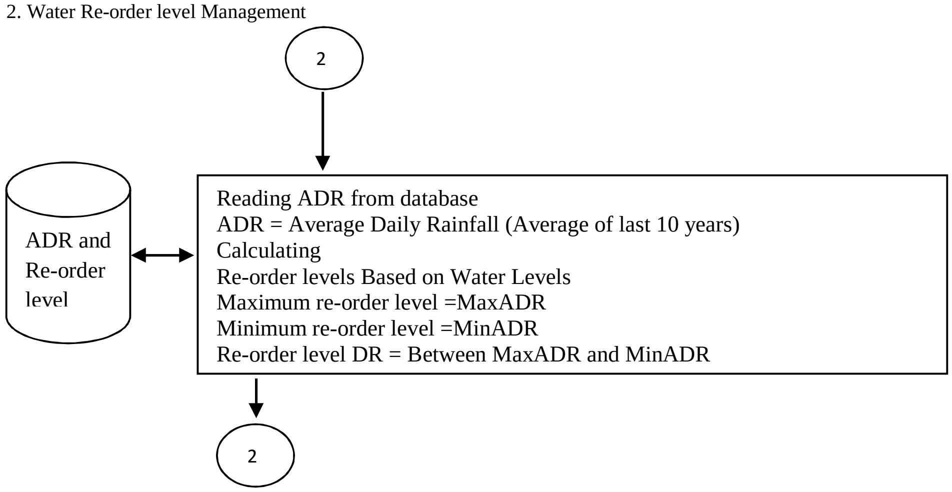
VI. FLOWCHAR

FIGURE: 1 OVERALL FLOWCHART OF PROPOSED SYSTEM





1. Recording and Claim Verification.
2. Water Re-order level Management



VII. CONCLUSION AND REMARKS

The most common benefit of mobile devices, as found by the survey is its penetration in rural India as the largest basic medium of basic communication. The mobile phone is the only convenient mode of communication to which farmers have access. So it would help the farmers and the rural people if used properly and would be beneficial to most of them. As far as infrastructure is concerned in India, the Mobile communications services reach to each and every remote place. We have surveyed the current market which shows the basic requirement for running the application is available easily which Indian rural people can afford. **(Biswajit Saha, et al. 2012).**

M-services focused mainly on the provision of farming and market information, services are becoming more comprehensive, offering more diverse and multiple functions that support farmers at different stages of agricultural production – a trend that will need to continue to increase the effectiveness of m-services in agriculture. At the same time, it will be crucial to embed these services in complementary support programmes and infrastructure developments to address other production and market limitations that cannot be resolved through mobile phones. The challenges they encounter when adopting new agricultural technologies are particularly severe and often complex, thus making it even more urgent to integrate m-services into broader support efforts. Further analysis will also need to focus on how m-services could best be used to address multiple constraints, either by providing several complementary functions or by integrating m-services with other support activities. Moreover, just as successful technology adoption is related to the farming context, suitability and effectiveness of m-services will be shaped by the context in which they are offered. These dynamics remain seriously under-researched. Further studies are essential so as to be able to adjust the services to the particular needs of the farming communities and develop business models that lead to the establishment of m-services for resource-poor farmers. Such research will need to be based on an interdisciplinary approach that takes into account the economic, social and biophysical dimensions of the users, technologies and farming contexts. (Heike Baumuller 2012).

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