

## RESEARCH NOTE

## Oil Palm Kisan Mobile Message Services - A New Paradigm in Technology Dissemination

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### ABSTRACT

*Oil Palm Kisan Mobile Message Services was launched with an objective to disseminate oil palm technology through mobile message services to the stakeholders' viz., oil palm growers, officials of State Department of Agriculture / Horticulture, oil palm processors and scientists. A total of 13,834 unique mobile numbers were collected. Seventy two message contents were developed and published two types of messages to mobile numbers viz., 1. Message through Short Message Service (SMS) in text form. A total of 54 text contents were prepared in vernacular languages and sent to 3.12 lakh mobile numbers as SMS with a delivery percentage of 81 per cent. 2. Message in the form of Voice calls with a total of 41 contents were pre-recorded and sent to 3.61 lakh mobile & landline numbers and delivery percentage was 42.9 per cent. Feed back on published SMS and voice messages revealed that majority of the respondents are in the age group of 41-60 years; having young plantations, having 5-8 year old plantations; having secondary education; belong to small and big/large farmers category. Majority of them are receiving the messages; regular in reading/listening the messages. They have indicated that the messages are audible; language is understandable; message is useful; relevant to their crop growth; messages are being discussed/spread and adopting the practices disseminated through SMS/Voice messages. They preferred mode of mobile service through voice or SMS or both; would like to have weekly messages; indicated that messages are accurate, brief and clear. Usefulness of the subjects is as follows viz., irrigation, fertilizer application, and disease management and weed control.*

**Key words:** ICT; Mobile Message Services; Oil Palm; SMS; Voice call;

Revolutionary development in information and communication technology made mobile phones available for every individual. Indian telecom operators added a stunning wireless subscriber base within the last decade. The total number of mobile subscribers in India has increased from 6.4 million in March, 2002 to around 350 million in December, 2008 and further to 875.48 million by end of October, 2013 with an overall wireless tele density of 70.96. This hectic pace of wireless subscriber additions means that the Indian mobile subscriber base has shown a year on year growth. Keeping these facts in view, it could be inferred that "it is none other than a mobile which will bring drastic changes in information and communication technology in Indian conditions".

The other side of the coin is, India being agriculture based country, farmers are still not realising the fruits of research and development in agriculture. They are

facing several difficulties like improper or lack of right information at right stage of crop growth. It is highly necessary that the technology developed in labs must be disseminated to farmers for adoption to achieve desired productivity and production.

Oil palm is an introduced crop in India and commercially grown in an area of 2.30 lakh ha. It is nature's gift to Indian farmers that our country's climatic conditions are good for its growth. We still depend on vegetable oil imports for domestic requirements. Hence it is required to augment our vegetable oil production. Oil Palm being high oil yielding crop, it is required to improve our domestic palm oil production by adopting the appropriate management practices of oil palm.

Indian Council of Agricultural Research working with the motto of "Agri search with human touch" is taking initiatives for dissemination of technology through mobiles, with the financial support from Technology

Mission on Oilseed and Pulses, Ministry of Agriculture, Government of India. Directorate of Oil Palm Research has taken lead in this important farmer pro activity by implementing a project on “Oil Palm Kisan Mobile Message Services” for dissemination of oil palm technology to the stakeholders viz., oil palm growers, officials of State Department of Agriculture / Horticulture, oil palm processors and scientists.

Similarly with high credibility different research and development organizations are working independently to meet common goal. Intra and inter connectivity will facilitate the organizations to reach one another quickly with reliable data to take quick decisions in oil palm development. Hence this intervention of mobile message service will not only help farmers but also help all the related organizations to work for oil palm development more effectively and efficiently in a coherent manner. Disseminate oil palm technology through mobile message services to the stakeholders’ viz., oil palm growers and officials of State Department of Agriculture / Horticulture and oil palm processors.

**METHODOLOGY**

The programme was conceptualized and implemented in the following two stages ie. (i) collection of mobile numbers of oil palm growers and content preparation, (ii) publishing of messages, retrieval of published data, reports and collection of feedback.

In order to implement this programme, software development was done to store and retrieve the data. The software was developed with front-end in ASP.net and backend SQL Server 2008 and reports were created using Crystal Reports 10.0.

Mobile numbers of stake holders’ viz., Oil Palm growers’, officials of State Department of Horticulture / Agriculture, oil palm processors were collected from different oil palm growing states in the country. A total of 51,229 numbers were collected from all over India, processed and 13,834 were found to be unique among them. Contents on recommended package of practices of oil palm was developed in English and translated to other languages viz. Hindi, Kannada and Telugu.

Collected the mobile numbers and grouped into three categories (Table 1). Farmers who are growing oil palm in Andhra Pradesh, Goa, Gujarat, Karnataka, Maharashtra and Mizoram states. Officials of State

Department of Horticulture/Agriculture of respective states viz. Andhra Pradesh, Goa, Gujarat, Karnataka, Maharashtra and Mizoram involved in oil palm development programme.

Persons / organisations who are involved in oil palm area expansion, collection and processing of oil palm viz., M/s. Ruchisoya oils. Pvt. Ltd., M/s. Navabharat Agro Products Pvt. Ltd., M/s. 3F oils Pvt. Ltd, M/s. Lashmi balaji oils Pvt. Ltd. M/s. Godrej Agrovvet Ltd., M/s. AP Oilfed, M/s. Radhika Vegetable oil Pvt. Ltd., M/s. Simhapuri Agroproducts Pvt. Ltd. M/s. Vaidehi Oil Palm Ltd.

Mobile numbers that were collected from oil palm growers, entrepreneurs / oil palm processors and state department of agriculture (SD) / horticulture (Table 1) were received in different forms.

**Table 1. Mobile numbers collected from farmers, officials & processors of different states in India**

State	Farmers	S.Dept.	Processors	Total
AP	14,389	7	241	14,637
Goa	128	-	-	128
Gujarat	452	-	-	452
Karnataka	1,501	282	6	1,789
Maharashtra	138	-	-	138
Mizoram	103	36	-	139
Total	16,711	325	247	17,283

Collected mobile numbers were pre-processed to obtain the data in uniform style. Pre-processing includes removal of excess digits (>10), codes, removal of symbols such as /,S/O,D/O,W/O,@,%,\$,-,space etc. These pre-processed numbers were updated into the database to obtain the list of unique numbers (Table 2)

**Table 2. Mobile numbers collected from Oil Palm stake holders of different states in India**

State	Received mobile no. count	Pre-processed count	Customer count	Unique count
AP	47,494	26,385	14,637	11,347
Goa	165	148	128	122
Gujarat	830	452	452	283
Karnataka	2,419	2,227	1,789	1,638
Maharashtra	148	145	138	125
Mizoram	173	159	139	123
Total	51,229	29,515	17,283	13,834

A total of 51,229 mobile numbers were received from the states of Andhra Pradesh, Karnataka, Gujarat,

Goa, Mizoram and Maharashtra. From Andhra Pradesh a total of 47,494 mobile numbers were collected, contributing 94.74 per cent of the collected mobile numbers. From Karnataka 2419 mobile numbers (2.72%) were collected. From Gujarat 830 mobile numbers were collected followed by Mizoram (173) Goa (165) and Maharashtra (148). In Andhra Pradesh mobile numbers were collected from eight districts viz., East Godavari, West Godavari, Ananthapur, Krishna, Visakhapatnam, Nellore, Nalgonda and Vizianagaram. Similarly mobile numbers of farmers were collected from different districts of Karnataka; Gujarat; Goa; Mizoram and Maharashtra. After processing a total of 13,834 mobile numbers were found unique to which messages were sent.

*Content development:* Contents were developed on different aspects of oil palm such as planting, irrigation, fertilizers, intercultural operations, intercropping, pest and disease management, harvesting etc. These aspects represent different growth stages of oil palm. From the major cultivation aspects, 72 message contents were developed in English on the practices to be adopted by oil palm growers in oil palm cultivation. Keeping in view of the farmers' choice for local language, respective vernacular languages were chosen to send the text / Voice messages. So as to send these messages in vernacular languages, English messages were translated to vernacular languages viz., Hindi, Kannada and Telugu.

*Importing mobile numbers and message contents to data base :* The pre-processed data available as an Excel file having a uniform format on details of Farmer name, father name, village, mandal, district, mobile phone number, in some cases land line number, client type, year of planting, factory zone, area under cultivation, is imported to the SQL-Server database using the screen Import Data into SQL Database. The content of text SMS prepared in English and vernacular languages could be stored into the database using the data entry screen for message entry. Voice message were recorded and saved as .wav files. Separate screens are made available to enter the data in English and Vernacular languages.

*Message publishing and report preparation for text and voice messages:* Messages were published to the processed unique mobile numbers, these mobile numbers got information in the form of SMS through a bulk SMS service provider. The message thus published were transferred to the SMS Gateway of the service provider and then moved to the SMS Centre (SMSC) of the service provider that was available with different

Operators. From these SMSC the message reached the oil palm growers. Similar is in case of voice message also. Two types of messages were sent to mobile numbers.

- i. Message through Short Message Service (SMS) in text form. Content prepared in vernacular languages and sent to mobile numbers as SMS
- ii. Message through Voice Message in audio form. Content was pre-recorded and sent to mobile numbers as voice message.

The content in text messages is sent as voice message to emphasize the message and also to reach the growers who are unable to read the message.

## RESULTS AND DISCUSSION

*Reports for text messages:* Once the text SMS is published, the delivery status of the message to individual mobile number is retrieved into an Excel format which has the details of mobile number, date and time of publishing, the delivery status of the message, SMS count for the message etc. A total of 54 text SMS were published to 3.12 lakh mobile numbers with a delivery percentage of 81.05 per cent (Table 3).

**Table 3. Text messages published and delivery (Del.)**

Month & Year	No of SMS	Sent No's	Del. No's.	Del. %	Count Msg.	Total SMS	Total Msg Del.
Feb,12	1	203	188	92.61	1	203	188
Mar,12	4	10288	8429	81.93	8	20896	16838
Apr,12	6	20237	17848	88.19	19	60546	53468
May,12	4	15384	13469	87.55	11	43179	37772
Jun,12	4	12591	11217	89.09	11	34624	30826
Jul,12	8	40168	34449	85.76	16	124332	106640
Aug,12	4	26435	22389	84.69	16	105740	89556
Sep,12	4	33869	27572	81.41	12	101607	82740
Oct,12	6	50805	41514	81.71	15	143945	116733
Nov,12	1	8468	7142	84.34	3	25404	21426
Dec,12	2	20618	16706	81.03	6	61854	50118
Jan,13	1	10404	5950	57.19	4	41616	23800
Feb,13	6	36536	30415	83.25	14	108852	90798
Mar,13	3	6622	6083	60.41	7	65998	48958
Total	54	312628	253371	81.05	143	938796	769861

*Reports for voice messages:* After the message is published as a voice call, the status is available in the form of a report in Excel format which has the details of mobile / landline number, date and time of publishing the voice call, date and time of receipt of voice call, duration of listening to the voice call, status of the voice call etc. A total of 40 voice messages were published to 3.71 lakh mobile / landline numbers of which the delivery percentage is 42.75 (Table 4).

**Table 4. Voice messages (Vmsg) published and delivery percentage**

Month & year	No. of Vmsg	Sent	Delivered	Delivered %
JUN,12	1	11519	4576	39.73
JUL,12	4	17262	8308	48.13
AUG,12	3	19505	10328	52.95
SEP,12	5	46460	21517	46.31
OCT,12	4	37172	14631	39.36
NOV,12	7	65051	29292	45.03
DEC,12	4	38532	13540	35.14
JAN,13	5	57237	23987	41.91
FEB,13	4	45164	19486	43.14
MAR,13	3	34041	13346	42.45
Total	40	3,71,943	1,59,011	42.75

**Table 5. Categorization of farmers based on age**

Category	No.	%
20-40	15	29
41-60	32	63
>60	4	8
Total	51	100

**Table 6. Categorization of farmers based on age of plantation**

Category	No.	%
1to4 years	25	49
5 to8 years	19	38
9to 12 years	5	9
>12 years	2	3
Total	51	100

**Table 7. Categorization of farmers based on education**

Category	No.	%
Illiterate	11	22
Primary	6	12
secondary	22	43
Intermediate	7	14
UG	4	8
PG	1	2
Total	51	100

**Table 8. Categorization of farmers based on area under oil palm cultivation**

Category	No.	%
1 ha (Marginal)	4	8
2 ha (Small)	19	37
2-3 ha (Big)	10	20
4 ha & above (Large)	18	35
Total	51	100

*Feedback from farmers* : After sending the messages, to know the applicability and usage, a feedback study was conducted. Feedback has been obtained by administering a structured schedule from 51 farmers. Feed

back on the SMS and voice messages was obtained through phone in survey method (by using standardized questionnaire) from 51 respondents / oil palm growers who are regular readers of SMS and listeners of Voice messages. Feed back on published SMS and voice messages revealed that majority of the respondents (63%) are in the age group of 41-60 years (Table.5); 49 per cent are having young plantations (1-4 years), 38 per cent are having 5-8 year old plantations (Table.6); having secondary education (43%) (Table.7); belong to small (37%) followed by big (20%) and large farmers (35%) category (Table 8).

Majority of the farmers are receiving the messages (94%), regular in reading/listening the messages (88%). They have indicated that the messages are audible (88%), language is understandable (86%); message is useful (80%), relevant to their crop growth (68%); messages are being discussed/spread (80%), 33 per cent of them are adopting the practices disseminated through SMS/Voice messages; indicated that messages are accurate(75%), brief (75%) and clear (78%) (Table 9).

**Table 9. Categorization of Farmers on various voice message criteria**

Category	Yes	No	No Resp- onse	Total
Receipt of voice message	No. 48 % 94	0	3	51 100
Regularity in listening voice Msg.	No. 45 % 88	0	6	51 100
Audibility of voice message	No. 45 % 88	0	6	51 100
Language Understanding	No. 44 % 86	0	7	51 100
Ability of Voice Msg.	No. 41 % 80	1	9	51 100
Usefulness of voice message	No. 80 % 80	2	18	100
Relevance of voice msg. to Crop Growth / Stage	No. 35 % 68	4	12	51 100
Discussion / spread of voice msg.	No. 41 % 80	0	10	51 100
Adoption of practices sent through voice Msg.	No. 17 % 33	7	27	51 100
Accuracy of voice message	No. 38 % 75	0	13	51 100
Briefness of voice message	No. 38 % 75	0	13	51 100
Clarity of voice message	No. 40 % 78	0	11	51 100

**Table 10. Categorization of farmers based on different actions consequent to voice message**

Category	No.	%
<i>Follow up</i>		
Official visit	7	14
Scientist field visit	6	12
No response	38	75
Total	51	100
<i>Consultation</i>		
Through phone	40	78
No response	11	22
Total	51	100
<i>Service required</i>		
Toll free	41	80
No response	10	20
Total	51	100
<i>Preference mode</i>		
Voice	25	49
SMS	5	10
Both	16	31
No response	5	10
Total	51	100
<i>Frequency</i>		
Weekly	36	71
No response	15	29
Total	51	100

Usefulness of the subjects as perceived by the farmers are as follows viz., irrigation (16 per cent), fertilizer application (14%), disease management (8%) and weed control (4%) (Table 11). In the feedback, farmers indicated to have followed up visit of officials (14%) and scientists (12%) (Table 10). Farmers would like to consult through phone (78%) for follow up action; opined to have toll free facility (80%); preferred mode of mobile service was through voice (49%); SMS (10%)

or both (31%); would like to have weekly messages (71%). The findings of *Kameswari, et al. (2011)*, *Mary et al. (2012)* and *Dhaliwal et al. (2010)* were in the same line of the present study.

**Table 11. Categorization of farmers based on Usefulness of voice message**

Category	No.	%
Irrigation	8	16
Disease management	4	8
Weed control	2	4
Fertilizer application	7	14
No response	30	59
Total	51	100

## CONCLUSION

Mobile message services were used to disseminate the oil palm technology through SMS and voice calls. Database having messages on 72 contents of oil palm package of practices were developed and are available under nine categories in four languages i.e. English, Hindi, Kannada and Telugu as text and voice messages. Database having 13,834 unique mobile and land line numbers of stake holders was made available from Andhra Pradesh, Karnataka, Goa, Gujarat, Maharashtra and Mizoram to send advisories. Published 54 text SMS having an SMS count of 9.38 lakh and 81.05 per cent as delivery percentage. Published 40 voice messages to 3.72 lakh mobile and landline numbers and delivery percentage was 42.75. Feedback revealed that mobile services are useful in adoption of practices, would like to have SMS/Voice message at weekly interval, farmers' like to have toll free call back facility to contact the officers and scientists for oil palm cultivation and improve production.

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