Int.J.Curr.Microbiol.App.Sci (2017) *6*(1): 988-992

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 6 Number 1 (2017) pp. 988-992**
Journal homepage: http://www.ijcmas.com

Original Research Article http://dx.doi.org/10.20546/ijcmas.2017.601.117

Constraints to Adoption of Conservation Agriculture Technologies among the Farming Community in Tamil Nadu, India

J. Vasanthakumar[1*], M. Ramasubramaniyan[2] and B. S. Hansra[3]

[1](Agriculture), Annamalai University, Chidambaram, Tamil Nadu, India
[2]National Agro Foundation, Chennai, Tamil Nadu, India
[3]School of Agriculture, IGNOU, New Delhi, India
**Corresponding author*

Keywords

Conservation Agriculture - Knowledge, Biophysical, Technological, Socio-economic, Institutional and Policy Constraints - Tamil Nadu

Article Info

Accepted:
09 December 2016
Available Online:
10 January 2017

A B S T R A C T

Conservation Agriculture (CA) enhances productivity and maintains the environmental safety and ecological sustainability. According to majority of the respondents, inadequate knowledge on CA as a package was perceived to be the major constraint in adoption of CA. Biophysical constraints predominantly included uncertain monsoon and lack of availability of labour. Technological constraints such as non-availability of desired CA technologies and machineries and policy constraints such as lack of priority, promotion and incentives for adoption were also considered as major constraints. Socio-economic constraints like strong belief in ploughing and institutional constraints like lack of market for alternate crops were also considered as major constraints to adoption of CA.

Introduction

Conservation Agriculture (CA) technologies involve minimum soil disturbance, permanent soil cover through crop residues or crop covers and crop rotations for achieving higher productivity (Bhan and Behra, 2014). Conservation Agriculture (CA) offers potential solution which not only enhances the productivity but also maintains the environmental safety and ecological sustainability. The key elements of CA include: (i) minimum soil disturbance by adopting minimum tillage and traffic for agriculture operations (ii) leave and manage the crop residues on the soil surface and (iii) adopt spatial and temporal crop sequencing / crop rotations to derive maximum benefits from inputs and minimize adverse environmental impacts. FAO (2008) asserted that introduction and adoption of CA must overcome a range of constraints that have been highlighted by a number of stakeholders. The present study was intended to explore the constraints faced in adoption of CA technologies among the farming community across Tamil Nadu State from the perspectives of the farmers at the grass root level as well as from other stakeholders at the institutional level.

Materials and Methods

The study was conducted in seven agro climatic zones covering entire Tamil Nadu State which included North Eastern Zone,

North Western Zone, Western Zone, Cauvery Delta Zone, Southern Zone, High Rainfall Zone and Hilly Zone. The study area was selected in such a way that in each of the agro-climatic zones, the blocks where annual crops are predominantly cultivated were selected as conservation agriculture is more applicable and relevant to those cropping pattern where intensive agriculture throughout the year is practiced. From the selected blocks, study villages were selected by simple random sampling. Since the cropping pattern was almost uniform across each of the agro-climatic zones, one block per agro-climatic zone was randomly selected irrespective of the number of blocks present in the zone. The respondents were selected using simple random sampling method. Totally three hundred and fifty respondents were randomly selected in seven agro climatic zones @ fifty respondents from each of the agro climatic zone. Data was collected with the use of a well-structured and pre- tested interview schedule.

Results and Discussion

Constraints in adoption of Conservation Agriculture

Among various constraints, Knowledge constraint was ranked first followed by Bio-physical constraints (II rank). Technological and policy constraints were jointly ranked third. This was followed by socio- economic and institutional constraints ranked fourth and fifth, respectively. According to majority of the respondents, inadequate knowledge on CA as a package was perceived to be the major constraint in adoption of CA. Biophysical constraints predominantly included uncertain monsoon and lack of availability of labour. Technological constraints such as non-availability of desired CA technologies and machineries and policy constraints lack of priority, promotion and incentives for adoption were also considered as major constraints. Socio-economic constraints like strong belief in ploughing and institutional constraints like lack of market for alternate crops were also considered as major barriers for adoption of CA. The finding corroborates the results of Friedrich and Kassam (2009) who listed the main barriers to the adoption of CA practices as: knowledge on how to do it, mindset, inadequate policies, unavailability of appropriate equipment and machines, and of suitable herbicides to facilitate weed and vegetation management.

Knowledge, Bio-physical and Technological Constraints

Among several constraints, lack of knowledge on CA was perceived as the foremost constraint faced by the respondents. Many of the respondents (71.71%) expressed that lack of adequate and proper knowledge about Conservation Agriculture as a whole package as the reason for non- adoption of CA. Among the Bio-physical constraints, uncertain monsoon and non-availability of sufficient labour force for agriculture were reported. While 48.29% of the respondents expressed that uncertain monsoon was a major constraint, 39.23% of the respondents opined that non- availability of sufficient labour was the constraint that would affect potential adoption of CA. CIAT (2011) concluded that the low level of adoption of CA is due to labour constraints. Thirty per cent of the respondents expressed that non-availability of desired CA technology was the major technological constraint. Non-availability of Zero-till seed drill and difficulties in irrigating un-ploughed fields were also mentioned as constraints by few of the respondents. CIAT (2011) concluded that the low level of CA was due to various constraints, key among them being lack of appropriate farm implements at affordable costs.

Table.1 Constraints faced by the respondents in adoption of CA technologies

S. No	Constraints	Number	Percentage	Rank
1	Knowledge Constraints	251	71.71	I
2	Bio-Physical Constraints	169	48.29	II
3	Technological Constraints	71	20.29	III
4	Socio-economic Constraints	54	15.43	IV
5	Institutional Constraints	39	11.14	V
6	Policy Constraints	71	20.29	III

Table.2 Knowledge, Bio-physical and Technological Constraints faced by the respondents in adoption of CA technologies

S. No	Constraints	Number	Percentage	Rank
A. Knowledge Constraints				
1.	No knowledge about CA	251	71.71	I
2.	Not interested in new technology	89	25.43	III
3.	Difficult to follow new technology	99	28.29	II
B. Bio-physical Constraints				
1.	Problem of weed dominance in un-ploughed fields	39	11.14	III
2.	Persistence of causal organisms of pest and diseases due to stubbles	10	2.86	V
3.	Uncertain monsoon	169	48.29	I
4.	Grazing of cattle into cultivated lands	32	9.14	IV
5	Non- availability of labour	138	39.43	II
C. Technological Constraints				
1.	Non-availability of desired technology	71	20.29	I
2.	Non-availability of zero till Seed Drill	7	2.00	II
3.	Lack of faith in Conservation Agriculture technologies	2	0.57	V
4.	Difficulty in intercultural operations	7	2.00	II
5.	Difficulties in irrigation in un-ploughed fields	6	2.00	IV

Table.3 Socio-economic, Institutional and Policy Constraints faced by the respondents in adoption of CA technologies

S. No	Constraints	Number	Percentage	Rank
A.	**Socio-economic Constraints**			
1	Non- availability of money to purchase CA implements	54	15.43	II
2	Non- availability of credit for investment into CA technologies	4	1.14	V
3	Influence of neighbouring farmers who are non-adopters	30	8.57	III
4	Perceived non- availability of fodder for cattle	18	5.14	IV
5	Strong faith in ploughing	67	19.14	I
B. Institutional Constraints				
1	Lack of adequate research on CA	10	2.86	III
2	Inadequate extension services at village level	28	2.29	II
3	Insufficient training programme	3	0.86	V
4	Non availability of crop insurance scheme	4	1.14	IV
5.	Lack of market for crops other than conventional crops in rotation	39	11.14	I
C. Policy Constraints				
1.	No thrust / priority to conservation agriculture	16	4.57	II
2.	Insufficient budg*et al.*,location for CA research and development	3	0.86	III
3.	No incentives for CA adoption	71	20.29	I

Socio-economic, Institutional and Policy Constraints

Socio-economic constraints mainly included strong faith of the respondents in intensive ploughing as one of the major barriers to resort to CA which primarily emphasizes on minimal soil disturbance.

About one-fifth of the respondents (19.14%) expressed that they had strong belief in intensive ploughing for profitable agriculture. In the past, Abrol and Sangar (2006) reported that the biggest challenge to promote CA was to break the barrier of strong mindset of farmers with intensive tillage. This argument was further strengthened by Hobbs *et al.*, (2008) who reported that overcoming traditional mindsets about tillage by promoting farmer experimentation with this technology in a participatory way will help accelerate adoption of Conservation Agriculture. Lack of market for crops other than conventional crops in crop rotation has been highlighted as the major institutional constraint by 11.14% of the respondents.

Lack of incentives for adoption of CA was reported a major constraint by one-fifth (20.29%) of the respondents. Raina *et al.*, (2005) reported that there was a need for policy analysis to understand how conservation technologies integrate with other technologies, policy instruments and institutional arrangements that promote or deter CA. The findings of Mazvimavi *et al.*, (2010) proved that Government's role is vital in creating a favorable policy environment

that will ensure the possibility of continued CA promotion and adoption.

In view of the increased emphasis laid on Conservation Agriculture for enhancing productivity and ensuring ecological sustainability, the results on constraints would help understanding the issues faced by practitioners. Inadequate knowledge on CA as a package was perceived to be the major constraint in adoption of CA by majority of the respondents. Biophysical constraints predominantly included uncertain monsoon and lack of availability of labour.

Technological constraints such as non-availability of desired CA technologies and machineries and policy constraints such as lack of priority, promotion and incentives for adoption were also considered as major constraints. Socio-economic constraints like strong belief in ploughing and institutional constraints like lack of market for alternate crops were also considered as major barriers for adoption of CA.

These results are to be considered by policy makers and extension workers while drawing a strategy for promoting Conservation Agriculture technologies.

References

Abrol, I.P, and S. Sangar, 2006, Sustaining Indian Agriculture - Conservation Agriculture the Way Forward, Current Science, 91 (8):2010-2015.

Bhan, S. and U.K. Behra, 2014, Conservation Agriculture in India - Problems, Prospects and Policy Issues, International Soil and Water Conservation Research, 2(4):1-12.

CIAT, 2001, Final Technical Report on Promoting Conservation Agriculture to Improve Land Productivity and Profitability among Smallholder Farmers in Western Kenya by The African Network for Soil Biology and Fertility (AfNet) of the Tropical Soil Biology and Fertility Institute of CIAT (TSBF – CIAT).

FAO, 2008. Investing in Sustainable Crop Intensification: The Case for Soil Health. Report of the International Technical Workshop, FAO, Rome, July. Integrated Crop Management, Vol. 6. Rome: FAO. Online at: http://www.fao.org/ag/ca/.

Friedrich, T and A.H. Kassam, 2009, Adoption of Conservation Agriculture Technologies: Constraints and Opportunities, Proceedings of the IV World Congress on Conservation Agriculture, ICAR, New Delhi, India, 4-7 February, 2009.

Hobbs, R.P., Sayre, K and R. Gupta, 2008. The Role of Conservation Agriculture in Sustainable Agriculture, Phil Trans R Soc B 363:543-555.

Masvimavi, K., Ndlovu, P. V., Nyathi, P., and I.J. Minde, 2010, Conservation Agriculture practices and Adoption by Smallholder Farmers in Zimbabwe. Poster presented at the Joint 3rd African Association of Agriculture Economists (AAAE) and 48th Agriculture Economists Association of South Africa (AEASA), Cape Town, South Africa, September 19-23, 2010.

Raina, R.S., R. Sulaiman, A.J. Hall, and S. Sangar, 2005, "Policy and institutional requirements for transition to conservation agriculture: An innovation systems perspective in Abrol, I.P. Gupta, R.K. and R.K. Mallik (Ed.), Conservation Agriculture - Status and Prospects, Centre for Advancement of Sustainable Agriculture, New Delhi, pp.224-232.

How to cite this article:

Vasanthakumar J., M. Ramasubramaniyan and Hansra B. S. 2017. Constraints to Adoption of Conservation Agriculture Technologies among the Farming Community in Tamil Nadu, India. *Int.J.Curr.Microbiol.App.Sci.* 6(1): 988-992. doi: http://dx.doi.org/10.20546/ijcmas.2017.601.117