

Research Article

Adoption of recommended soil and water conservation practices among the beneficiaries of Sujala Watershed Project in Northern Karnataka

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SUMMARY : The study conducted during 2012-2013 in Haveri and Dharwad districts of Karnataka state where in Sujala watershed project was implemented during 2001 to 2007. The distribution of beneficiaries and non-beneficiaries in adoption of recommended soil and water conservation practices shows that highest per cent of beneficiaries (86.25%) as compared to non-beneficiaries (57.50%) adopted shrub check. More number of beneficiaries adopted water ways (65.00%), boulder bund (62.50%), dugout or water recharge pit (58.75%) and vegetative bunds (52.50%) as compared to non-beneficiaries (23.75%, 43.75%, 27.50% and 26.25%, respectively). Around one-third of beneficiaries adopted sunken ponds (38.75%) and farm pond (30.00%) as compared to non-beneficiaries (13.75% and 16.25%, respectively). Adoption of contour bund, rubble check, contour strip and staggered contour trench was noticed with very less per cent of beneficiaries (12.50%, 8.75%, 6.25% and 6.25%, respectively). But none of the non-beneficiaries adopted contour bund, contour strip and staggered contour trench. The overall distribution reveals that, high per cent of beneficiaries were noticed in high and medium adoption category (43.75% and 40.00%, respectively) as compared to non-beneficiaries (20.00% and 27.50%, respectively). Low adoption category was observed with more number of non-beneficiaries (52.50%) as compared to beneficiaries (16.25%). The extent of adoption amongst beneficiaries was positively correlated with land holding, extension participation, annual family income, awareness of soil erosion problems and accessibility to farm implements and the age was noticed to be negatively correlated. And amongst non-beneficiaries only annual family income was positively correlated with adoption of soil and water conservation practices Whereas, the education, farming system, family type, perception of usefulness of practices, achievement motivation and risk orientation were not related with the adoption of soil and water conservation practices among both beneficiaries and non-beneficiaries.

KEY WORDS :

Beneficiaries, Adoption, Soil, Water conservation practices, Sujala Watershed Project

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BACKGROUND AND OBJECTIVES

Agriculture productivity mainly dependent on land and water in addition to management practices. Therefore, the conservation, up gradation and utilization of these two natural resources on scientific principles is essential for the sustainability of rainfed agriculture. As a natural unit of ecosystem planning and

development, watershed is widely used in most of the countries. Watershed development is a holistic approach to build and strengthen the basic resources, so as to enable the establishment of sustainable life support.

In India, watershed development programme is being taken up under various programmes launched by the Government of India. Of the various schemes of watershed project World Bank

assisted Sujala watershed project is a unique programme as it is implemented by the communities through participatory management. In Karnataka this project was designed and implemented by the watershed development department during 2001-2009 in five districts of Karnataka viz., Dharwad, Haveri, Chitradurga, Kolar and Tumkur, covering about 0.5 million ha of land in 77 sub watersheds benefitted about four lakh families in 1270 villages spread across five districts.

Underlying the importance of Sujala watershed programme, the present study was designed with the overall objective of measuring the adoption of soil and water conservation practices among beneficiaries in comparison with non-beneficiaries in purposively selected Dharwad and Haveri districts of Northern Karnataka.

RESOURCES AND METHODS

The study was conducted in Haveri and Dharwad districts of Karnataka state during 2012-2013 covered under Sujala watershed project. The research design adopted for this study was *Ex-post-facto* technique. Two villages from each watershed were purposively selected based on maximum area and maximum number of respondents covered under the watershed. Thus, eight villages from four watersheds implemented in Haveri and Dharwad districts were selected for the study. From these selected villages, 10 beneficiaries

and 10 non-beneficiaries were selected randomly. Thus, 80 beneficiaries of Sujala watershed and 80 non-beneficiaries were selected to constitute 160 samples for the study. The independent variable age, education, land holding, annual income, family type, achievement motivation, risk orientation, farming system, extension participation, awareness of soil erosion problems and accessibility to farm implements were selected for the study. The adoption behaviour of the respondent was measured by using pre-tested teacher made test. The answers were quantified by giving score one to adopters and score zero to non adopters. The variables selected for the study were measured by using the procedure developed by the earlier researchers. Appropriate statistical tools like frequency, percentage, mean, standard deviation, correlation were used for data analysis.

OBSERVATIONS AND ANALYSIS

The results on personal, socio-economic and psychological characteristics of beneficiaries and non-beneficiaries of Sujala Watershed project presented in Table 1 have been discussed below.

It is evident from the data (Table 1) that more number of beneficiaries belonged to middle age and young age group (42.50% and 25.00%) as compared to non-beneficiaries (27.50% and 22.50%, respectively). Whereas, more number of non-

Table 1: Distribution of respondents based on personal, socio-economic and psychological characteristics (n=160)

| Sr. No. | Characteristics | Beneficiaries (n ₁ =80) | | Non-beneficiaries (n ₂ =80) | |
|---------|--|------------------------------------|----------|--|----------|
| | | Frequency | Per cent | Frequency | Per cent |
| 1. | Age | | | | |
| | Young age (35 years and below) | 20 | 25.00 | 18 | 22.50 |
| | Middle age (36-50 years) | 34 | 42.50 | 22 | 27.50 |
| | Old age (Above 50 years) | 26 | 32.50 | 40 | 50.00 |
| 2. | Education | | | | |
| | Illiterate | 18 | 22.50 | 15 | 18.75 |
| | Primary school | 28 | 35.00 | 31 | 38.75 |
| | High school | 18 | 22.50 | 25 | 31.25 |
| | Higher secondary school | 10 | 12.50 | 06 | 7.50 |
| | Graduate | 06 | 7.50 | 03 | 3.75 |
| 3. | Land holding | | | | |
| | Marginal farmer (Upto 2.50 acres) | 07 | 8.75 | 12 | 15.00 |
| | Small farmer (2.51 to 5.00 acres) | 22 | 27.50 | 24 | 30.00 |
| | Semi-medium farmer (5.01 to 10.00 acres) | 20 | 25.00 | 23 | 28.75 |
| | Medium farmer (10.01 to 25.00 acres) | 23 | 28.75 | 15 | 18.75 |
| | Big farmer (More than 25 acres) | 08 | 10.00 | 06 | 7.50 |
| 4. | Annual family income | | | | |
| | Low (<Rs.68950) | 31 | 38.75 | 41 | 51.25 |
| | Medium (Rs.68950-115212) | 22 | 27.50 | 29 | 36.25 |
| | High (>Rs. 115212) | 27 | 33.75 | 10 | 12.50 |
| | Mean :92, 081 SD: 54, 426 | | | | |
| 5. | Type of the family | | | | |
| | Joint family | 24 | 30.00 | 34 | 42.50 |
| | Nuclear family | 56 | 70.00 | 46 | 57.50 |

beneficiaries (50.00%) belonged to old age group compared to beneficiaries (32.50%). It is usually the youth who take more interest and are energetic to adopt innovative practices like soil and water conservation structures as compared to old age group, hence, the results. The results are in line with the findings of Omprakash *et al.* (1998) and Madhavareddy (2001).

Comparatively more number of beneficiaries possessed higher secondary school education (12.50%) and graduation (7.50%) as compared to non-beneficiaries (7.50% and 3.75%, respectively). Primary school with one-third of both beneficiaries (35.00%) and non-beneficiaries (38.70%) were observed. This clearly indicated that majority of beneficiaries had minimum education due to increased cosmopolitanism which might have helped them to take the benefit of the project. And also the relative importance of literacy and facilities for education might have helped both beneficiaries and non-beneficiaries to become literates. Similar distribution was also reported in the studies of Reddy (2005), whereas, the high incidence of illiterates was noticed in the research studies of Amsalu and Graaff (2006).

The results showed that almost equal per cent of beneficiary farmers belonged to medium land holding category (28.75%) followed by small size holding (27.50%), whereas in non-beneficiaries more number of farmers were noticed in small holding (30.00%), followed by semi-medium holding (28.75%) The similar situation of land holding distribution was also

noticed in the findings of Raghavendra (2004) and Chandra Charan *et al.* (2007).

One-third of beneficiaries (33.75%) had high family income as compared to non-beneficiaries (12.50%). And also comparatively high per cent of non-beneficiaries (51.25%) were observed in low family income as compared to beneficiaries (38.75%). This might be due to fact that beneficiaries have more holding and practicing diversified farming system as compared to non-beneficiaries.

Similarly the varied annual income distribution amongst beneficiaries of watershed and other farmers were also reported in the studies of Reddy (2005) and Biradar (2008).

Majority of the beneficiaries (70.00%) were noticed in nuclear type of families as compared to non-beneficiaries (57.50%). The possible reasons for this might be that nuclear family helps in planned way of agriculture and helps to lead independent life with required basic amenities.

Similarly more incidence of nuclear family among beneficiaries of watershed was also reported in the studies of Thirangangowda (2005) and Amsalu and Graaff (2006).

Extent of adoption of recommended soil and water conservation practices by the beneficiaries and non-beneficiaries :

The data in Table 2 revealed that, more than 60.00 per cent of beneficiary farmers adopted the practices like shrub check, water ways and boulder bund. Around 50.00 per cent

Table 2: Extent of adoption of recommended soil and water conservation practices

| Sr. No. | Practices | (n=160) | | | |
|---------|-----------------------------|------------------------------------|----------|--|----------|
| | | Beneficiaries (n ₁ =80) | | Non-beneficiaries (n ₂ =80) | |
| | | Frequency | Per cent | Frequency | Per cent |
| 1. | Contour bund | 10 | 12.50 | 00 | 00.00 |
| 2. | Contour strip | 05 | 6.25 | 00 | 00.00 |
| 3. | Water ways | 52 | 65.00 | 19 | 23.75 |
| 4. | Farm pond | 24 | 30.00 | 13 | 16.25 |
| 5. | Staggered contour trench | 05 | 6.25 | 00 | 00.00 |
| 6. | Vegetative bund | 42 | 52.50 | 21 | 26.25 |
| 7. | Boulder bund | 50 | 62.50 | 35 | 43.75 |
| 8. | Shrub check | 69 | 86.25 | 46 | 57.50 |
| 9. | Rubble check | 07 | 8.75 | 02 | 2.50 |
| 10. | Dugout / water recharge pit | 47 | 58.75 | 22 | 27.50 |
| 11. | Sunken pond | 31 | 38.75 | 11 | 13.75 |

Table 3: Distribution of respondents based on overall adoption SWC practices

| Sr. No. | Category | (n=160) | | | |
|---------|----------|------------------------------------|----------|--|----------|
| | | Beneficiaries (n ₁ =80) | | Non-beneficiaries (n ₂ =80) | |
| | | Frequency | Per cent | Frequency | Per cent |
| 1. | Low | 13 | 16.25 | 42 | 52.50 |
| 2. | Medium | 32 | 40.00 | 22 | 27.50 |
| 3. | High | 35 | 43.75 | 16 | 20.00 |
| | Mean: | | 2.48 | | |
| | SD: | | 4.07 | | |

adopted dugout or water recharge pit and vegetative bund as compared to non-beneficiaries. The adoption of sunken pond and farm pond was noticed with one-third of beneficiaries and less than one-fourth of non-beneficiaries.

Lastly the adoption of contour bund, rubble check, contour strip and staggered contour trench was noticed with less than 10 per cent of beneficiaries but none of non-beneficiaries adopted them.

The overall distribution (Table 3) brings to light that high and medium adoption was noticed with more number of beneficiaries (43.75% and 40.00%, respectively) as compared to non-beneficiaries (20.00% and 27.50%, respectively).

This clearly indicates that beneficiaries had more adoption than non-beneficiaries. This might be due to fact that beneficiaries had the opportunities of experiencing the benefits of watershed technology and the less adoption of practices might be due to small holding distribution and lack of convection about soil and water conservation practices.

Similarly, the comparative study of beneficiaries and non-beneficiaries of watershed under taken by Dakhore *et al.* (1993) also reported more number of beneficiaries in medium and high adoption practices as compared to non-beneficiaries.

Relationship of independent variables with adoption of soil and water conservation practices :

It is observed from Table 4 that the adoption of soil and water conservation practices among beneficiaries was positively correlated with land holding, extension participation, annual family income, awareness of soil erosion problems and accessibility to farm implements, but negatively correlated with age. Whereas, among non-beneficiaries annual family income was positively correlated.

But the variables education, farming system, family type

and perception of usefulness of practices, achievement motivation and risk orientation were not related with the adoption of soil and water conservation practices among both beneficiaries and non-beneficiaries.

This shows that variables such as land holding, extension participation, annual family income, awareness of soil erosion problems and accessibility to farm implements were identified as dominant variables through which adoption of watershed technology can be achieved.

Similarly the positive relation between adoption of soil and conservation practice with land holding, annual income, extension participation, awareness soil erosion problem and accessibility to farm implements was also reported in the studies of Tenge *et al.* (2004) and Yadav (2012). Whereas, the negative significant association of age with adoption was noticed in the studies of Budry Bayard *et al.* (2006). Similar work on the related topic was also done by Hemalatha *et al.* (1996); Gupta *et al.* (2009); Sisodia and Sharma (2008); Ravi Shankar *et al.* (2007); Kadam *et al.* (2001) and Lapar *et al.* (1999).

Conclusion :

The overall situation shows that farmers were not making efforts to adopt and to maintain soil and water conservation practices. Hence, there is need for appropriate interventions in realizing the consequences of land degradation and motivate farmers for adoption of watershed technologies. Majority of beneficiaries and non-beneficiaries found to practice soil conservation practices to a less extent. This emphasised the need for providing skill training and timely adequate input and services to motivate and attract the farmers towards watershed technologies.

Table 4 : Relationship of independent variables with adoption of soil and water conservation practices

| Sr. No. | Variables | 'r' value | |
|---------|---|---------------|-------------------|
| | | Beneficiaries | Non-beneficiaries |
| 1. | Age | -.270* | -0.095 |
| 2. | Education | 0.014 | 0.085 |
| 3. | Land holding | .417** | 0.139 |
| 4. | Annual family income | .243* | .224* |
| 5. | Family type | 0.009 | 0.002 |
| 6. | Farming system | 0.211 | 0.079 |
| 7. | Extension participation | .528** | 0.095 |
| 8. | Achievement motivation | 0.028 | -0.009 |
| 9. | Risk orientation | -0.038 | 0.06 |
| 10. | Awareness of soil erosion problem | .332** | 0.167 |
| 11. | Accessibility to farm implements | .244* | 0.017 |
| 12. | Perception of usefulness of soil and water conservation practices | 0.182 | -0.047 |

* and ** indicate significance of values at P=0.05 and 0.01, respectively

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REFERENCES

- Amsalu, A. and Graaff, J.** (2006). Farmers' views of soil erosion problems and their conservation knowledge at Beressa watershed, central highland of Ethiopia. *Agric. & Human Values*, **23** : 99-108.
- Biradar, B.** (2008). A study on impact of income generating activities on sustainable rural livelihoods of KAWAD project beneficiaries. M. Sc. (Ag.) Thesis, University of Agricultural Sciences, Dharwad, KARNATAKA (INDIA).
- Budry Bayard, Curtis, M.J. and Dennis, Shannon A.** (2006). The adoption and management of soil conservation practices in fort-Jacques capital of Haiti : the case of rock walls. *Agric. Econ. Rev.*, **7** (2) : 28-39.
- Chandra, Charan V., Syed, Sadaqath and Hirevenkanagoudar, L.V.,** (2007). Adoption of watershed practices by the respondents of Sujala watershed, *Karnataka J. Agric. Sci.*, **20**(1) : 176-177.
- Dakhore, K.M., Mahajan, B.S. and Digraaskar, S.V.** (1993). Adoption of dry land technology by farmers. *Maharashtra J. Extn. Edu.*, **12** : 215.
- Gupta, Vinod, Rai, P. K. and Nanda, Rakesh** (2009). Soil conservation competencies of the farmers in the watershed area of Vijaypur block of Jammu, India, *Indian Res. J. Extn. Edu.*, **9** (2) : 125-128.
- Hemalatha, B. Surekha, S. and Nagaraja, N.** (1996). A study on knowledge of farmers about watershed development. *Karnataka J. Agric. Sci.*, **9** : 666-669.
- Kadam, J.R., Patil, V.G. and Hardikar, D.P.** (2001). Knowledge and adoption of soil and water conservation practices in watershed development project. *Maharashtra J. Extn. Edu.*, **20** : 138-140.
- Lapar, M., Lucila, A. and Pandey, S.** (1999). Adoption of soil conservation : the case of Phillippine uplands. *Agric. Econ.*, **21** : 241-256.
- Madhavareddy, K.V.** (2001). Peoples' participation in watershed development programme implemented by Government and non-government organization – A comparative analysis. M.Sc. (Ag.) Thesis, University of Agricultural Sciences, Bengaluru, KARNATAKA (INDIA).
- Omprakash, Sinha, Lakhan, Mishra, A.S. and Vishwanatham, M. K.** (1998). Constraints in adoption of soil conservation measures by the farmers of Doon Valley. *Indian J. Soil Cons*, **26**(1) : 48-51.
- Raghavendra, H.C.** (2004). A study on knowledge and adoption level of soil and water conservation practices by farmers in northern Karnataka. M.Sc. (Ag.) Thesis, Thesis, University of Agricultural Sciences, Dharwad, KARNATAKA (INDIA).
- Ravi Shankar, K., Subrahmanyam, K.V., Reddy, B.M.K. and Sharma, K.D.** (2007). Farmer's perception and adoption patterns of soil and water conservation measures : A case in Nalgonda district of Andhra Pradesh. *Indian J. Dryland Agric. Res. & Dev.*, **22**(2) : 197-200.
- Reddy, Ninga** (2005). A study on knowledge, extent of participation and benefits derived by participant farmers of the watershed development programme in Raichur district of Karnataka state. M.Sc. (Ag.) Thesis, University of Agricultural Sciences, Dharwad, KARNATAKA (INDIA).
- Sisodia, S. S. and Sharma, C.** (2008). Constraints faced by the farmers in adoption of watershed development programme, Udaipur, Rajasthan, *Indian Res. J. Extn. Edu.* **8**(1) : 60-62.
- Tenge, A.J., De Graff, J. and Hella, J.P.** (2004). Social and economic factors affecting the adoption of soil and water conservation behaviours in the west Usambara Highlands, Tanzania. *Land Degrad. Dev.*, **15** : 99-114.
- Thiranjangowda, B.** (2005). A study on cultivation and marketing pattern selected cut flower in Belgaum district of Karnataka. M. Sc. (Ag.) Thesis, University of Agricultural Sciences, Dharwad, KARNATAKA (INDIA).
- Yadav, J.P.** (2012). Correlates of adoption of watershed technology of NWDPR Jaipur region of Rajasthan. *Indian Res. J. Extn. Edu.*, **1** : 211-216.

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