Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 08, pp.56158-56161, August, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

HELPING FARMERS IMPROVE THE QUALITY OF THE ENVIRONMENT IN TECHNICAL IRRIGATION IN SOUTH SULAWESI INDONESIA

Faizal Amir and *Mithen Lullulangi

Lecturer Fakultas Teknik Universitas Negeri Makassar

ARTICLE INFO

Article History:
Received 12th May, 2017
Received in revised form
20th June, 2017
Accepted 17th July, 2017
Published online 31st August, 2017

Key Words:

Training,
Model,
Farmers,
Environmental Quality,
Irrigation Area.

ABSTRACT

The objective of the research is to find a research training model (R & D) for farmers to improve the environment quality in technical irrigation. The sample respondents were chosen by thepurposive sampling method. Data collection was done by giving a questionaire to the respondents. The analysis used was descriptive analysis. The results of the research are as follows: the training model consists of seven steps, namely: (a) perform aneeds analysis, (b) formulate thetraining objectives, (c) develop thetraining materials, (d) determine the tests and training methods, (e) conduct apreliminary assessment, (f) conduct training,and (g) make a final assessment. Thedescription of thetraining materials required by thefarmers, consisted of: (a) knowledge of wetland agricultural ecosystem, (b) environmental knowledge, (c) knowledge of irrigation area maintenance, (d) knowledge of environmental pollutionand (e) conservation knowledge of irrigation areas.Thedevelopment of training materials shall be carried out in the following steps: (a) analyzing the objective-based materials, (b) designing training materials based on theobjectives, (c) develop the material by referring to the relevant literature, (d) validate, (e) implement materialsand (f) conduct an evaluation.

Citation: Faizal Amir and Mithen Lullulangi, 2017. "Helping Farmers Improve the Quality of the Environment in Technical Irrigation in South Sulawesi Indonesia", *International Journal of Current Research*, 9, (08), 56158-56161.

INTRODUCTION

The technical irrigation area is a sub-system of the ecosystem as a whole and is a built environment for farmers. Irrigation is the main means for farmers to farm, i.e.,interacting with the environment to conduct various farming efforts to obtain products of farming businesses that can be sold for income. Therefore, this area needs to be maintained so that the quality of the environment and farmers' income is improved. The declaration is in accordance with the Law of the Republic of Indonesia Number 32 of 2009 on Environmental Protection and Management, which states that everyone has the right to a good, healthy, and environmentally responsible environment to preserve the environment, prevent, andcope with pollution and prevent damage to the environment. Chiras (1985) states that the environment needs to be nurtured continuously so as to provide a variety of natural resources for sustainable human needs. Furthermore, Sastrawijaya (2009) states that between humans and the environment there is a reciprocal relationship. Man and his environment are an integral whole. Humans affect the environment, and vice versa; humans are influenced by the environment. Based on that opinion, it can be understood that farmers areone unit with irrigation area. Farmers determine the bad environment or irrigation areas. Therefore, farmers should have knowledge of the environment, knowledge of the ecosystem, knowledge of farming, positive attitude towards irrigation, and good behavior to maintain irrigation so as to conserve irrigation and sustainable farm land for a long time in the future. Agricultural activities that can cause pollution include the use of various pesticides. Pesticides can be carried by rain water from drainage of rice fields to irrigation channels, rivers, and others. Excessiveuse of chemical fertilizers will lead to eutrophication, which grows fertile algae and water weeds. These plants interfere with the use of water for drinking, irrigation, fisheries, and tourist attractions. When the plant dies, it settles and decomposes, and decay takes place. The decomposition will disturb the sanitation of the reservoir (State Minister of Environment Regulation No. 01 The year 2010 on the Management of Water Pollution Control). The use of chemicals for the control of insects, pests, weeds, and fungi in agricultural areas has increased the productivity of farming. However, excessive use threatens the lives of humans and other species (Brundtland, 1988). Water can transmit diseases directly. Various insects, like mosquitoes, need water to grow and multiply. Mosquitoes can infect humans with dengue fever, malaria, and elephantiasis (Soerjani, *et al*., 1987).

Corresponding author:* **Mithen Lullulangi,
Lecturer Fakultas Teknik Universitas Negeri Makassar.

It is known that the use of chemical fertilizers by farmers in agricultural areas has increased agricultural production, but excessive use decreases the quality of the environment. Excessive use of chemical fertilizers will disrupt the use of water for various purposes. Water in wetland farms is a place to grow and breed a variety of disease-carrying predators. Therefore farmers in irrigation areas need to be empowered so that they have sufficient knowledge, positive attitude, and sustainable behavior toward their environment. The research of Muhammad Ardi (2011), on the behavior of the community in maintaining the environment in agriculture in Soppeng Regency, found that the behavior of the people in irrigated agriculture areas in the aspects of (1) maintaining the tract is still low, (2) landslides are low, (3) repair and maintenance oftertiary channels and irrigation buildings are very low. Muhammad Ardi's (2012) research on thefactors that influence farmers behavior in farming and the preservation of the environment in some irrigation areas in South Sulawesi Province. The results of the research indicate that farmer behavior is strongly influenced by (a) ecosystem knowledge, (b) environmental knowledge, (c) environmental conservation knowledge, (d) farming knowledge, (e) attitudes toward the environment, and the environment. The study of Muhammad Ardi (2013) on the knowledge and attitude of farmers in farming and conservation of the environment in wetland, farmland and buffer zones in Soppeng Regency foundthat: (a) ecosystem knowledge, environmental knowledge, environmental conservation knowledge and knowledge about farmers' farming in wetland, moorland, and buffer zones is not sufficient for farming and conserving the environment, (b) farmers' attitudes towards the environment, and farmers' attitudes towards farming in these three areas have not been good.

The objectives of the research are: (1) to examine and find a training model to improve environmental quality continuously in the technical irrigation area, (2) to examine and find textbooks (teaching material) in the continuous improvement of environmental quality in thetechnical irrigation area. The various theories underlying this research are as follows: Goad (1982) in Hanrahmawan (2010) suggests a training model with the following steps: (1) analyze to determine training requirements; (2) design the training approach; (3) develop the training materials; (4) conduct the training; and (5) evaluate and update the training. Nadler (1982) developed a training model known as The Critical Events Model (CEM) or an open training model with the following steps: (1) determining the organization's needs; (2) specifying task implementation specifications; (3) determining learning needs; (4) formulating objectives; (5) determining the curriculum; (6) choosing a learning strategy; (7) determining the source of learning; and (8) conducting training; Then back to determine the needs. This rotation aims to see the advantages and disadvantages of training that have been implemented. Friedman and Elaine (1985) put forward six stages of the training process. The six stages are as follows: (1) awareness of need; (2) analyzing the problems; (3) knowing options; (4) adopting a solution; (5) teaching a skill; and (6) integration in the system. Djudju Sudjana (1993) developed a training model with the following steps: (1) conducting recruitment of training participants, (2) identifying needs, sources, and possible barriers; (3) determining and formulating training objectives; (5) conducting preliminary evaluation of the trainees, (6) implementing the training process, (7) carrying out the final evaluation of the activity, and (8) carrying out the evaluation of the program training. Banathy in Sanjaya (2011) designed a learning program consisting of six stages as follows: (1) analyzing and formulating objectives; (2) formulating test criteria; (3) analyzing and formulating learning activities; (4) designing systems; (5) implementing, and (6) making improvements and changes based on the evaluation. Dick and Carey in Sanjaya (2011) designed a training model that starts from (1) identification of objectives, (2) formulating the test, (3) developing learning strategies according to goals, and (4) evaluating. The various training and learning models that have been proposed are a reference or foundation for finding a model for training of farmers in technical irrigation areas in order to improve sustainability. The Law of the Republic of Indonesia No. 32 of 2009 on the Protection and Management of the Environment, states that the environment is a system that is a unity of space with all objects, and living things including human beings and their behavior that determines the life and welfare of human beings and other living creatures. Further Soerjani, *et al*. (1987) statedthat the environment is a living system in which there is human intervention ofthe ecosystem order.

If environmental knowledge, attitudes toward the environment, knowledge, and behavior of farming, and farmer behavior maintain good irrigation areas, the irrigation areas will not experience degradation. Irrigated areas that suffer from degradation do not benefit farmers. Soemarwoto (1985), suggeststhat environmental degradation poses an environmental risk, not environmental benefits. Soerjani, *et al* (1987), said that the nature of environmental management by humans is how humans make efforts to improve human quality, while environmental quality is also getting better. Irrigation by Dumairy (1992) and Pasandaran (1991) is an artificial procurement of water supply, both ground water, and surface water, to support agricultural development. Adequate irrigation facilities will increase agricultural production, farm income, and the economy as a whole. This concept brings increased efficiency and effectiveness of irrigation in the form of water-saving technology. Although there is already a water distribution arrangement on an irrigation system, farmers' competition in water use is difficult to avoid. This fact is in line with what Siy (1982) proposes, that farmers who have greater access to water supplies rarely pay attention to water consumption that exceeds their needs. Furthermore, Levine (1980), suggests that the mechanism of water use in irrigation areas should be expanded and be made efficient by incorporating additional functions necessary for the operating system, namely the maintenance of basic means of irrigation and handling of farmers' disputes arising from water problems.

RESEARCH METHODS

The research approach used is development research, with the following steps: (1) conducting survey research to study the training model and teaching materials; (2) developing teaching materials and models to continuously improveenvironmental quality in technical irrigation areas. Research location is the technical irrigation area in South Sulawesi Province. The sample area is selected by the purposive sampling method that is, the Langkemme irrigation area in Soppeng Regency. The Langkemme irrigation area is one of the technical irrigation areas that irrigates large rice fields, where the environment in this irrigated area is poorly maintained. The research respondents were chosen by thepurposive sampling method. Respondents of this researchwere 25 people fromthe leadership

and employees of the Regional Environment Service, the Public Works Service (irrigation), the Forest Service, the Agriculture Service, andthe Community Leaders (Farmers), each consistingoffivepersons. The variables or concepts to be considered are: (1) a suitable training model for farmers' development in improving environmental quality in a sustainable manner in theLangkemme irrigation area; and (2) description of training materials along with their development to improve environmental quality in a sustainable manner in theLangkemme irrigation area. Data collection was done by giving questionnaires to respondents whose contents involvedthe determination of thetraining model and training materials. The model and teaching materials were validated by relevant experts. Data analysis used was qualitative descriptive analysis.

RESULTS AND DISCUSSION

The training models found in the effort to improve the environmental quality in a sustainable manner in the technical irrigation areas were as follows: (1) conducting needs analysis; (2) formulating training objectives; (3) developing training materials; (4) determining the test and training methods; (5) conducting an initial assessment (6) conducting training; and (7) making a final assessment. Needs analysis wasdone to know exactly what knowledge wasneeded by farmersto improve the environmental quality continuously in thetechnical irrigation areas. Training objectives were formulated to determine the competencies required by thefarmers in an effort to improve the environmental quality in a sustainable manner in thetechnical irrigation areas. Training materials weredeveloped based on the needs of the farmers to meet their competence in an effort to improve environmental quality in a sustainable manner inthe technical irrigation areas. To measure the initial ability and end-ability of the trainees, a test was developed based on existing training materials. To maximize the time and effort, the training methodwasdetermined so that there was good communication between the farmers and trainers. Before thefarmers were given training, they were given a test to determine their initial competence (knowledge and attitudes toward the environment) in an effort to continuously improve the environmental quality in the technical irrigation areas.

Implementation of the training wascarried out in the following steps: (1) determining the training ground; (2) determining the trainees; (3) giving direction to the trainees and equalization of perceptions about the training objectives; (4) supplying the farmers withtraining materials based on predetermined objectives; (5) providing an opportunity for the farmers to ask questions that are not yet understood; (6) the trainer responding to all questions and providinga more detailed explanation so that the farmerscouldunderstand the training materials; (7) the trainer providing a reinforcement of the core material that is difficult for a farmer to understand; and (8) the trainer terminating the training activity by first providing direction and motivation for the next training. After all the training materialshadbeen submitted, the test to determine the improvement of competence of thefarmers based on thetraining objectives that have been formulatedwas administered. This finding is supported by Goad (1982) in Hanrahmawan (2010), Nadler (1982)and Friedman and Elaine (1985), which states that the training model begins with needs analysis, material delivery, and evaluation. Description of thetraining materials needed bythe farmers in an effort to improve environmental quality in a sustainable manner in technical irrigation areas are: (1) knowledge of wetland agricultural ecosystem; (2) environmental knowledge; (3) knowledge of irrigation area maintenance; (4) knowledge of environmental pollution; and (5) conservation knowledge of the irrigation areas.

The knowledge of wetland agricultural ecosystems is a reciprocal relationship between all living and non-living beings that exist in wetland farming areas (technical irrigation areas) including the peasants whoinfluence each other and form a system. The knowledge of this ecosystem must be understood by the farmers so that theycan maintain the irrigation area in a sustainable manner. Environmental knowledge in technical irrigation areas is dominated by wetland farms and in it, there areobjects and power including humans that determine the condition of the space. This environmental knowledge should be owned by thefarmers so that theycan maintain thesustainable irrigation areas. Irrigation maintenance, as well as the trunk, secondary channel, tertiary channel, irrigation building, and sewer, must be maintained by thefarmers. Therefore, thefarmers should have knowledge about how to maintain irrigation areas so that theirrigation areas do not cause harm to thefarmers and the government. The entry of certain organisms in irrigation areas which resulted from the irrigation areas continuously decreasing inquality is called environmental pollution. For example, the use of excessive pesticides and chemical fertilizerscan result in environmental pollution. The farmers must understand the elements that can harm farming and harm the health of farmers. In this way, the farmers will remain healthy in trying to farm in irrigated areas that do not experience degradation.

Conservation knowledge in irrigation areas involves knowledge of all known elements for continuouslyimproving theenvironmental quality in the technical irrigation areas. Therefore, thefarmers in irrigation areas should understand the elements related to improving the quality of the environment. In this way, thefarmers can behave well in maintaining the irrigation areas in a sustainable manner. This finding is in line with Soerjani, *et al*. (1987) and Soemarwoto (1985), who statedthat the environment consists of two parts, namely the physical environment and social environment;this environment needs to be nurtured so as to benefit humans in the future. Training materials weredeveloped in the following steps: (1) analyzing objective-based materials; (2) designing training materials based on objectives; (3) developing the material by referring to the relevant literature; (4) validating; (5) implementing materials; and(6) conducting an evaluation. This finding is in line with what was proposed by Trianto (2012), Morrison, Ross,and Kemp (2004), Molenda (2003), and Dick andCarey (2001), who stated that material development begins with analyzing materials, developing, and evaluating the materials.

Conclusion

1. The training model for the farmers to improve sustainable environmental quality in thetechnical irrigation areas in South Sulawesi consists of seven steps, as follows: (a) conducting needs analysis; (b) formulatingtraining objectives; (c) developing training materials; (d) determining the tests and training methods; (e) conducting preliminary assessments (f) conductingtraining; and (g) making a final assessment.

2. Description of training materials required by farmers to improve sustainable environmental quality in the technical irrigation areas in South Sulawesi are: (a) knowledge of wetland agricultural ecosystems; (b) environmental knowledge; (c) knowledge of maintenance of the irrigation areas; (d) knowledge of environmental pollution; and(e) irrigation area conservation knowledge
3. Development of training materialswas done in the following steps: (a) analyzing objective-based materials; (b) designing training materials based on the objectives; (c) developing the materialsby referring to the relevant literature; (d) validating; (e) implementing materials; and (f) conducting an evaluation.

REFERENCES

_____, 2012. *Beberapa Faktor yang Mempengaruhi Perilaku Petani dalam Berusaha Tani dan Melestarikan Lingkungan Hidup pada Beberapa Daerah Irigasi di Provinsi Sulawesi Selatan.* Makassar: Lembaga Penelitian Universitas Negeri Makassar.

_____, 2013. *Pengetahuan dan Sikap Petani Berusaha Tani dan Melestarikan Lingkungan pada Daerah Pertanian Basah, Daerah Pertanian Tegalan, dan Daerah Penyangga di Kabupaten Soppeng.* Makassar: Lembaga Penelitian Universitas Negeri Makassar.

Brundtland, Harlem Gro, *et al*. 1988. *Our Common Future. Hari Depa Kita Bersama.*Komisi Dunia untuk Lingkungan dan Pembangunan. (World Commission on Environment and Development).Jakarta: PT. Gramedia.

Chiras, Daniel D. 1985. *Environmental Science A Framework for Decision Making.* California: The Benjamin Cummings Publishing Co.

Dick, W., Carey, L. and Carey, J. 2001. *The Systematic Design of Instruction* (5th ed.). Allyn & Bacon.

Djudju Sudjana. 1993. *Metode dan Teknik Pembelajaran Partisipatif dalam Pendidikan Luar Sekolah.* Bandung: Nusntara Press.

Dumairy, 1992. *Ekonomika Sumberdaya Air.*Yogyakarta: BPFE UGM.

Friedman, Paul G. dan Elaine, A.Y. 1985. *Training Strategies: Form Start to Finish.* New Jersey USA: Prentice Hall International, Inc.

Hanrahmawan, Fitroh, 2010. "*Revitalisasi Manajemen Pelatihan Tenaga Kerja"* (Studi Kasus pada Balai Latihan Kerja Industri Makassar).*Jurnal Administrasi Publik.*

Levine, G. 1980. *Hardware and Software and Engineering Perspective on the Mix for Irrigation Management.* Philippines: Report of planning workshop on irrigation and water management, IRRI. Los Banos.

Molenda, M. 2003. *In Searchof The Elusive Addie Models.* Indiana University: Online *www.comp.dit.ie.../insearch ofelusiveaddie.pdf.* Diakses 10 April 2013.

Morrison, G. R., Ross, S. M. and Kemp, J. E. 2004. *Designing Effective Instruction* (4th ed). Hoboken, NJ: John Wiley & Sons, Inc.

Muhammad Ardi, 2011. *Perilaku Masyarakat Memelihara Lingkungan Pada Daerah Pertanian Irigasi di Kabupaten Soppeng*. Makassar: Lembaga Penelitian Universitas Negeri Makassar.

Nadler, L. and Nadler, Z. 1982. *Designing Training Programs: The Critical Events Model.* Houston, Texas: Gulf Publishing Co.

Pasandaran, E. 1991. *Irigasi di Indonesia.* Jakarta: Lembaga Penelitian Pendidikan dan Penerangan Ekonomi dan Sosial (LP3ES).

Peraturan Menteri Negara Lingkungan Hidup No. 01 Tahun 2010. Tentang Tatalaksana Pengendalian Pencemaran Air.

Sanjaya, Wina. 2011. *Strategi Pembelajaran Berorientasi Standar Proses Pendidikan.* Jakarta: Kencana Prenada Media.

Sastrawijaya, A. Tresna, 2009. *Pencemaran Lingkungan*. Jakarta: Rineka Cipta.

Siy, R. Y. Jr. 1982. *Community Resource Management: Lessons from Zanjera.* Quezon City: University of Phillippines Press.

Soemarwoto, Otto. 1985, *Ekologi Lingkungan Hidup dan Pembangunan.* Jakarta: PT. Jambatan.

Soerjani, M., Ahmad, R. and Munir, 1987. *Lingkungan, Sumberdaya Alam dan Kependudukan dalam Pembangunan.* Jakarta: Universitas Indonesia.

Undang-Undang Republik Indonesia Nomor 32 Tahun 2009 Tentang Pengelolaan Lingkungan Hidup.

****