

Credit for Conservation Farmings. A New Strategy in Soil and Water Conservation Programs in Indonesia

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Abstract: The government of Indonesia (GOI) have been carrying out several land rehabilitation and soil conservation programs to overcome the problems of land degradation and to increase the productivity of critical upland. Most programs have decreased soil erosion and increased farmers income slightly particularly during the implementation of the projects. Evidences suggest that maintenance of the soil and water conservation technologies (SWCT) declines and erosion increases on the dominant farming systems after the projects end. Income from food crops and other farmer products from the farming systems was not enough to maintain the agriculture activities including the maintenance of the SWCT. Most farmers are lacking of capital to provide seed of perennial crops, fertilizers, and livestocks to improve their farming systems. Therefore the GOI introduced a new strategy in implementing SWCT by providing credit for conservation farming system (CCFP), in upland agriculture with a special low of interest rate. Each farmer can apply credit with a limit of RP. 2,000,000 per hectare of agriculture land. This study was to evaluate the performances of the CCFP in six Provinces in regard to its expansion, its effectivity to control erosion and increase farms productivity and the status of the credit installments. Up to 1998/1999 the credit loan has been expanded to almost all Provinces of Indonesia and involved more than 12,000 farmers, 500 farmers groups in more than 35,000 ha of farms. This study conclude that the CCFP has been very effective to improve farmers capability in improving their conservation farming systems (CFS). The improved CFS have generally decreased erosion rate to the level of local tolerable soil loss, and increased farms productivity and family income. The payment of the credit installments has been generally carried out surprisingly well by the farmers. Most farmers have paid all the credits except some farmers in NTB. This is due to the farmers income is dominated by the income from foodcrops which generally low. Therefore, the structure of the CFS should be improved by including perennial crops and livestocks into the CFS. Its consequencey the amount of the credit limit should be increased and its time frame should be lengthen.

1 Introduction

The government of Indonesia (GOI) have been carrying out several land rehabilitation and soil conservation programs to overcome the problems of land degradation. A series of pilot projects were carried out since 1970's including National Reforestation Program (NRP) and Regreening and Reforestation Project (RRP), Upland Agriculture and Conservation Project (UACP), Sustainable Upland Farming System (SUFSS), and National Watershed Management and Conservation Project (NWMCP). The main purpose of the program was to reduce soil erosion by introducing new soil conservation structures such as bench terraces, ridge terraces, gully plugs, terraced channels, small dams, etc and rehabilitation of the existing conservation structures in the upland farms; most of the projects were located in Java. The basic approach of the latter soil conservation programs was to establish model farms unit and to introduce a package of agriculture inputs and conservation practices emphasizing the construction of bench terraces or ridge terraces and the use of new cropping patterns on land with slopes of up to 50 percent. For land with slopes of more than 50 percent, permanent vegetation (trees) was established. Subsidies either in cash or in kind, were provided for the construction of bench or ridge

terraces and the purchase of inputs. Evaluation studies of the above programs found that all programs have decreased soil erosion substantially (30%—80%) and increased farmers income slightly (10%—30%) (Sinukaban, 2000). The project goals of increasing income and reducing erosion were similar to those of previous upland conservation projects which were effective only during the implementation of the projects. Evidences suggest that maintenance of terraces declines and erosion increases after the project end. Farmers income were also decreased three or four years after the end of the projects. Surplus of income from food crops and other agricultural products is not enough to maintain the whole agricultural activities including the maintenance of terraces. However, in an improved conservation farming systems (CFS) where farmers include livestock and perennial crops in the farming systems their income increases sustainably (Sinukaban, 2000). The main problem in most upland agriculture, however, is that the farmers are lacking of capital to purchase seed of perennial crops, fertilizers, and livestock to develop the improved CFS. Therefore, lately, the GOI introduced a new strategy in implementing soil and water conservation programs by providing credit for conservation farming systems in upland agriculture with a special low of interest rate. The name of this program is credit for conservation farming systems program (CCFP). This study was to evaluate the performances of the CCFP.

1.1 Credit for conservation farming systems program (CCFP)

Credit for conservation farming systems program (CCFP) as a new strategy for implementing soil and water conservation technologies has been started since 1988 (DG. RRL, 1996). The objectives of this program are (1) to control erosion in upland agriculture and to reduce sedimentation in rivers and water bodies, (2) to increase land productivity and farmers income, (3) to improve farmers perception as a manager in managing natural resources (land, water, vegetation), (4) to increase the role of the related social institutions in rural area (farmer's groups, rural cooperative, and rural NGO's), and (5) to increase farmers knowledge and concern regarding the benefit of using banks services in agribusiness development. This program is open to all farmers in upland agriculture who agree with the following conditions : (1) farmers agree to implement the conservation farming program, (2) farmers agree to change their cropping pattern/system according to the programs guidance (3) the farmers should be a member of a farmer's group in respected location (4) the farmers agree to joint all preparation meeting, and training programs. Each farmer can apply the credit with a maximum amount of Rp. 2,000,000 per hectare of land with interest rate of 6% annually. The farmer has to pay the credit with its interest rate in 5 years including one year grace period by means of installments. The using of the credit is focused for: (1) establishing of new conservation structure or improving the existing conservation structures (bench terrace, ridge terrace, terrace channels etc) (Rp.1 100,000) (2) procurement of seeds (annual and perennial crops) and agriculture chemicals (fertilizers, pesticides) farm tools and purchasing of livestock (sheep, goat, cow, chicken) (Rp. 750,000), and (4) paying the cost for land titling (Rp. 150,000). To achieve its objective, the programs suggest the farmers to diversify their farms based on agro-ecological zone and markets demand, while improving the soil and water conservation technologies (SWCT). Therefore the farmers were recommended to change their monoculture system to intercropping system between annual food crops, perennial crops and livestock. The program also provide guide line for selection of crops suitable to various agro-ecological zone and training and extension services as well.

2 Materials and method

This study was carried out in six Provinces namely : West Sumatra, East Java, Bali, NTB, South Kalimantan, and South Sulawesi. Data employed in this research were obtained from primary and secondary sources. The effectiveness of the introduced CFS with corresponding soil and water conservation technology (SWCT) to reduce erosion was evaluated using the USLE. The economic performances and credit installments of the CFS were evaluated from the secondary data reported by the respected DG RRL and Bank of Indonesia in each Provinces. Quick interviews were also carried out to selected farmer and farmers groups for clarification in each Province.

3 Results and discussion

3.1 The expansion of the CCFP

The CCFP has been started since 1988. The coordinator of this program is the Directorate of Reboization and Land Rehabilitation (DG RRL), Department of Forestry. Up to year 2000, this program has been expanded to almost all Provinces of Indonesia and involved more than 12,000 farmers, 500 farmers group in more than 35,000 ha of farms (Table 1) (DG RRL, 1996 and DR KT and LP – IPB, 1999).

3.2 The effectiveness of the CCFP in controlling erosion

The main activities of the CCFP in the selected Propinces were to improve terraces (bench terraces, ridge terraces) to plant grasses and trees to protect terraces and to improve cropping patterns and farming systems. Typical cropping pattern and conservation measures of the CCFP is presented in Table 2. Basically the selected Conservation Farming Systems (CFS) and conservation measures engaged in each area were based on respective agro ecological zone. In general all CFS have decreased erosion substantially and its predicted erosion has been generally lower than the local tolerable erosion rate (Table 3). It is clear from Table 3 that the role of the improved soil and water conservation technologies (SWCT) and farming systems is very effective in controlling erosion to the level which lower than the local tolerable erosion rate. However in some cases (6 % of sample) where continous food crops without adequate SWCT were engaged, the erosion rate still higher than the local tolerable soil loss. All CFS where some food crops were rotated with other food crops with adequate SWCT or intercropping between food crops and some perennial crops or fruits and plantation crops with adequate SWCT, the predicted erosion have been lower than the local tolerable erosion rate. Therefore the continuation of the CCFP should be further emphasized on the improvement of the CFS and the SWCT by including perennial crops and livestock.

Table 1 The Expansion of CCFP in Indonesia (Directorate General of RRL, 1996)

No	Fiscal Year	Hectarage (ha)	Remarks
1.	1988/1989	126	Pilot project in 2 Provinces
2.	1991/1992	952	Expanded to 6 Provinces
3.	1993/1994	3930	Expanded to 21 Provinces
4.	1995/1996	11692	Expanded in 21 Provinces
5.	1998/1990	35 000 *	Expanded in 21 Provinces

*) Expected hectarage during the Sixth Five Year Development Plan.

Table 2 Typical cropping patterns and soil conservation measures of CCFP in selected areas

No	Provinces	Type of soil and water conservation measures	Cropping pattern
1.	West Sumatra	Bench terraces with grasses on terrace risers	Annual crops: Vegetables – ground nut; Vegetables – maize; Vegetables – ground nut – maize Perennial crops: Cassiavera, oranges, coconut, tobacco; Fodder : elephant grass, setaria; Livestocks : cow, goat

Continued

No	Provinces	Type of soil and water conservation measures	Cropping pattern
2.	East Java	Bench terraces, rehabilitation of existing terraces, Ridge terraces	Annual crops: Upland rice – soy bean, ground nut; Maize – soybean, ground nut; Upland rice + maize – soy bean. Perennial crops: Teak wood, manggoes, oranges avocados; Fodder : elephant grass; Livestocks : cow, sheep
3.	Bali	Rehabilitation of existing bench terraces, planting trees	Maize – soybean – ground nut; Maize – ground nut – soy bean ; Maize – ground nut – mung bean Perennial crops: Coffee, cacao, clove, coconut; Fodder : elephant grass; Live stocks : cow, sheep, pig
4.	Nusa Tenggara Barat (NTB).	Ridge terraces, Bench terraces, Planting grass, and gliricidia	Annual Crops: Ground nut – maize – fallow Perennial crops: Coconut, cashew nut, manggoes; Fodder : elephant grass; Livestocks : cow, sheep
5.	South Kalimantan	Ridge terraces, Bench terraces, Planting grasses on terrace risers	Annual crops: Rice – ground nut – maize Perennial crops : Rambutan, Jack fruit, bananas; Livestocks : Cow
6.	South Sulawesi	Bench terraces with grasses on terrace risers.	Annual crops: Vegetables – maize – soybean/ground nut (potatoes, cabbages, tomatos) Perennial crops: Markisa, cacao, cashew nut, manggoes, candle nut; Fodder: elephant grass; Livestocks : cow, sheep

Table 3 Typical Predicted Erosion and Respective Tolerable Erosion in Various CCFP (DRKT and LP –IPB, 1999)

Provinces	Number of Samples	Predicted Erosion, E, (ton/ha/year) Range (average)**	Respective Tolerable Erosion T, (ton /ha/yr) Range (average)**	Samples	
				E > T	%
West Sumatra	58	A*. 5—33 (18.0) B. 4—20 (12.0)	15—25 (20) 15—25 (20)	5	8.6
East Java	66	A. 8—37 (29.4) B. 3—20 (12.1)	22—40 (30.6) 22—40 (23.2)	1	1.5
Bali	60	A. 14—19 (16.5) B. 11—14 (13) C. 3—5 (4)	20—25 (22.5) 18—23 (20.5) 10—15 (12.5)	0	0
NTB	10	A. 5.0 B. 11—26 (21.1) C. 35.0	38.0 36—42 (40) 35.0	1	0
South Kalimantan	50	A. 1 > 27.0 (22.0) B. > -23.7 (15.4)	24—30 (26.4) 24—30 (26.7)	10	20.0
South Sulawesi	32	A. 49—25.9 (15.4) B. 9.4—15.8 (12.6) C 14.7—19.4 (17.0)	24.8—29.3 (27) 24.8—27.5 (26.6) 26.6—28.5 (27.6)	1	3.1

*) A. CFS – food crops with ridge terraces: without terrace protection

B. CFS – food crops with terraces (ridge terrace or bench terrace) with terrace protection (grasses or tree legume).

C. CFS – tree crops (fruits or plantation crops or forestry crops) with terraces.

***) numbers in parenthesis are the average of erosion or local tolerable erosion rate

Based on the data from sampled farmers, the sources of farmers income comes from food crops (rice, maize, soybean, ground nut) perennial crops, and livestock. The total farmers income was very much depend on the structures of income which was influenced by the cropping patterns on the respective CFS, yield, and the price of production (Table 4). The total net income of each family of the CCFP participants is ranged from Rp. 2,110,000 to Rp. 3,340,000 annually (Table 5). The lowest income was earned by the farmers in NTB and the highest by those in Bali. This total net income, including the lowest net income, is significantly higher than the those in the previous project in Java which was only Rp. 1,631,000 annually (Sinukaban 2000). It seems that the farmers who have income from cash crops (vegetables) and /or perennial crops and livestock earn higher net income. Therefore in further development of CCFP, the structure of the conservation farming systems should include perennial crops and livestock to increase the farmers income.

3.1 The credit installments

The instalments of the credit in the CCFP is surprisingly good. Based on the recent evaluation (DRKT and LP - IPB, 1999) almost all of the farmers have paid their credit instalments in time except in NTB. In West Sumatra, East Java, Bali, South Kalimantan, and South Sulawesi more than 80 % of the farmers have paid all of the credit installments. However, in NTB only about 40% of the farmers have paid their credit, 13 % have problems in the installments and no data from more than 40 % of the farmers. Eventhough, the CCFP has increased the farmers income in NTB, the credit installments here, were not very smooth. This probably because the surplus from their farms income is still not enough to fulfill the family need and the credit installments. Their income is dominated by income from food crops. Therefore the structure of the farming systems in NTB and other Provinces where the income structure is still dominated by food crops should be improved. Perennial crops and livestock should be included in the CFS, and therefore the amount of the credit limit should be increased and time frame of the credit installments should be lengthen.

Table 4 Dominant Cropping Pattern and Production Rate of CCFP in selected areas

Provinces	Cropping Pattern and Yield (Kg/year)*
West Sumatra	Chilli (3,000) – ground nut (800) – maize (1,900)
East Java	Rice (2,500) – Maize (3,000) – soy bean (800)
Bali	Maize (1,800) – soy bean (1,100) – ground nut (850) Perennial crops (147,000 grasses)
NTB	Ground nut (1,000) – maize (2,500) – fallow coconut (4,000), cashew (300) banana
South Kalimantan	Rice (1,900) – ground nut (1,700) – maize (1,500) – Perennials 200 kg banana
South Sulawesi	Tomato (2,500) – maize (1,700) – ground nut (1,500)

* Sources : From the report of DRKT and LP – IPB, 1999 with some recalculation.

Table 5 Cash Flow of Dominant Cropping Pattern of CCFP in selected areas*)

Provinces	Cropping pattern	Revenue Rp/Yr**	Production Cost RP/Yr	Net Income Rp/Yr
1. West Sumatra	Chilli-Ground nut – Maize+ Perennial + livestock	9,150,000	5,810,000	3,340,000
2. East Java	Rice – Maize – Soy bean Perennial + livestock	6,250,000	3,810,000	2,440,000
3. Bali	Maize – Soybean - Ground nut + Perennial + livestock	8,675,000	5,310,000	3,365,000
4. NTB	Ground nut – Maize + Perennial + livestock	4,650,000	3,640,000	2,110,000
5. South Kalimantan	Rice - Ground nut – Maize + Perennials+ livestock	4,830,000	2,540,000	2,290,000
6. South Sulawesi	Tomato – Maize - Ground nut + Perennial + livestock	9,100,000	5,810,000	3,290,000

*) Sources of data : DRKT and LP – IPB, 1999 with some recalculation

1 US \$ = Rp. 8000

4 Conclusions

The credit for conservation farming programs (CCFP) has been expanded to almost all Provinces in Indonesia and involved more than 12,000 farmers in 500 farmers groups in more than 3,5000 ha of farms. The CCFP has been very effective in improving the CFS, increasing farms productivity and farmers income and decreasing erosion to level of lower than the local tolerable erosion rate. The payment of the credit installments has been generally carried out surprisingly well. However the structure of the CFS in all areas should be further improved by intergrating perennial crops and livestock into the CFS. Therefore, the amount of the credit limit should be increased and the period of credit installments should be lengthen.

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