CONTRACTUAL AGROFORESTRY SCHEME: AN EXPERIENCE TOWARD AGROFORESTRY DEVELOPMENT AMONG THE ATA OF NEGROS ORIENTAL

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Introduction

Native tribal population constitutes a major group in t uplands. Their traditional hunting and collecting activities c flict with the demand for sedentary life necessary for agrof estry development in the uplands. Spatial mobility is a necess strategy for the natives to bring them to various resource ba within their habitat.

Among population groups, like the Ata, the desire to m around space is still their major preoccupation despite the dis pearance of the forest. In places where their forest habitat h been completely eliminated, the Ata still do not store enough f in their households, hence, their food base is situated in the ho holds of their technologically superior neighbors, the lowl Christian farmers. To tap this resource, they regularly move fr one household to another to sell their labor to the Christian fa ers for food. As a consequence, their own farm developm suffers. Intensive labor requirement for agroforestry deve ment of the Negritos' farms in the upland is usually not adequa provided.

This paper proposes a scheme of what we call a contrac agroforestry development in the uplands. On the basis of own experience with the Ata in Central Negros Oriental, I argue that contractual agroforestry provides an effective a native strategy in achieving the necessary farm developmen the denuded hilly lands. Such strategy is also considered ap priate for non-tribal population in the uplands especially w there is competing demand for immediate food production ag labor demand for long term development of the farm.

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Let me first socially situate our Ata experience in the light of our own action-research program in the uplands.

The Negritos and the Research-Action Development Program of Silliman University in the Uplands

There are two areas that concern us here: first, the Ata; second, our research action program in the uplands.

The Ata

The Ata are native tribal population group. They used to be the aboriginal population of the island, hence, the island has been known as Negros. As a people, they used to inhabit our lowland areas but as the Malayan lowland population group began to come in, the Negritos voluntarily retreated to the interior part of the island.

As a people, their lifestyle is characterized by a very simple form of technology and social organization which largely depends on what nature provides them. Through hunting, collecting and foraging, the people provided themselves with food. Consequently, their social organization has to be kept very loose to provide the necessary flexibility required for a hunting and foraging lifestyle. Leadership is not rigidly defined and the sense of community or village unit is rather weak.

A Negrito village therefore, usually consists of units of individuals who are never attached to a particular space. His attachment to it is as brief as its local resource can last. Once the local resource is consumed, he has to move. He is on the go. He is a jet-setter in the forest. You find him today in one part of the forest, the next day he must be somewhere else. This is his life and he loves it. There is nothing better to it that you can offer to him.

Surplus production is meaningless to him since nature stores his food. The forest takes care of everything he needs. The carbohydrate, the protein and the vitamins that his body needs are found in the forest by the wild root crops, faunal species and wild

For centuries this has been his life. He goes from one p to another for food. Since the beginning, he did not control food supply; he was controlled by his food supply. Yet, he happy. The forest provided him the shade and the cover neces for his hunting and foraging activities.

The forest is his life as water is for the fish. Hence, to the forest has spirits and power that can affect his life. Thi Ata. This is his lifestyle.

Suddenly, the forest was gone. The wave of lowland pop tio whose lifestyle is completely different from that of the Ne to, overrun the lowland and finally the highlands. They cleared the forest and the Negritos have suffer. The Negrito te nology and economic system is structured for the forest. T were unprepared and not ready to adopt to the disappearing est. They are now like fish thrown out from the sea gasping breath. He is literally dying. But his life has to keep movin he is now eking a living in an unfamiliar environment.

The technological system as well as the political, and socio-economic system of the Negritos in Negros Oriental yet adjusted for a non-forest sedentary life. There is a m process of deculturation. They have lost their traditional re toire for living without the necessary and appropriate rep ment. Hence, a cultural vacuum is created bringing confusio the local Ata.

Food production is very low. Their annual per capita duction from 1983 to 1984 showed that it was far below the rage per capita caloric requirement to hold body and soul ther for a functional average Filipino. From what a Ne produced, only approximately 21,200 calories are available in year. He supplements this limited available food through va processes of exchange (like wage labor, sale, loan, barter, s from harvests and gifts). This medium yields only around additional calories annually on a per capita basis. This s that in one year, an average Negrito will only ha total caloric supply of around 25,400 calories. Ideally, he n around 718,219 calories annually if we take the dietary allow

an average Filipino recommended by the Food and Nutrition Research Institute. What is available to Ata is only slightly less than four percent of the requirement, indicating a deficit of 96 percent. Indeed, that is terrible!

Apparently, there is no surplus that can be stored in the house, and hence, everyday his major concern is just to bring additional calories into his stomach to survive.

In contrast, his lowland Malayan neighbors (whose economy is geared toward storage of surplus food), are able to keep some calories in their store room ready for use when needs arise. Through exchange, a Negrito tries to make use of his lowland neighbors' resource. Ata "migrates" from one Cebuano house to another selling his labor in return for the needed calories. Everyday is a struggle for survival. His need is immediate and he is no longer capable of putting time into his own farm for long term development. Any input he has to make in his own farm will surely compete with his daily activities for subsistence. Poverty begets poverty. This marks the beginning of a various cycle on poverty.

This is the present picture of the Ata in central Negros Oriental. Under this circumstance, we introduce our assistance to this native tribal population.

Action Research Program In The Uplands

The action-research program of Silliman University, funded by the Ford Foundation, is designed to document the processes and the results of an intervention activities for upland populations. These activities are intended to achieve a number of things. First, in the site where patches of forests are still available, the program initiates efforts toward the protection of the remaining forests. In places where trees are gone, community reforestation is introduced. Second, through the introduction of appropriate farming practices in the uplands, the program hopes to increase household income. Third, since soil is basic in agriculture the program recommends effective soil use and conservation on the hilly lands. Appropriate soil fertility control and rehabilita

tion are introduced. Fourth, considering the complexity of upland problems, an integrated approach is employed which ta into account the health, education and other related services ai to improve the accessibility of the upland population to var social services. Fifth, through the integrated Social Fore scheme, the upland beneficiaries are provided with secured t rial arrangement to their land occupation.

The program has been implemented on two sites. On around Lake Balinsasayao in the municipality of Sibulan. site is about 25 kilometers northwest of Dumaguete City, occu by lowland Malay population who had migrated to the upl searching for land. Members of this group are generally the located lowland population.

The other site is in Barangay Cangguhub in the municip of Mabinay. The site is approximately 87 kilometers north of Dumaguete City. It is occupied by Ata families.

The program considers the two sites as different type laboratories where we can monitor the processes and the re of upland intervention in different human ecosystems. The is an upland community where few patches of forest are still available while its soil base is still intact and occupie sedentary lowland migrants. The second is another upland co nity where trees are completely gone, with soil erosion al reaching in its advance stage and occupied by an aboriginal g

Two different methodologies are employed. In Lake Ba sayao, non-contractual agroforestry is employed since the fa are migrant lowland Malay population who practice the stora surplus products. This practice allowed the farmers to i their time for long-term development of their farms witho cessarily having to compete with the need for a day-to-day getting activity to feed themselves.

In the Ata site, where there is no practice of food st a contractual agroforestry is employed. Since food getting a this people is a day-to-day activity, long-term development of

will compete with their daily struggle to produce food. Contractual agroforestry development was then considered as appropriate for their particular type of population.

Contractual Agroforestry Development

Contractual approach in agroforestry development is designed to accomplish the introduction of labor input into a cooperator's farm under a shared basis of costing. Normally, the cost of labor in the development of a cooperator's farm will be largely his contribution.

Instead, the contractual arrangement will only require the cooperator to assume part of the labor cost. Depending on the arrangement, the program may underwrite 50% of the total labor cost and the farmer takes the rest. The farmer is paid by the program either in cash or in kind. Our experience with the Negritos shows that in kind remuneration provides the program a better control of the population on the proper use of the resources. Cash can easily be spent for vicious activities like gambling and drinking.

Contractual approach is employed based on four assumptions.

First, labor supply in the household is not sufficient.

Second, farm development is labor intensive, and as such, it will usually lead into the development of boredom.

Third, labor inputs for long term development may compete with immediate short-term needs of daily subsistence activities of population.

Fourth, long-term development implications are not easily understood by the farmers. These have to be supplemented with immediate short-term considerations.

Our field data from Lake Balinsasayao show that only around % of the households have at least one additional household member of working age. The rest are either newly wedded couples

without children, or with growing young children, or old re ing couples whose children are already married. Since develop of upland farm is highly labor intensive, 60% of the house may not be able to implement farm development activities lack of manpower. Contractual system allows a farmer to additional labor.

The boredom that is associated with labor intensive activ can be minimized if a number of labor force work together. tractual arrangement allows a farmer to draw in additional l into his farm employing certain remuneration scheme. This increase the speed of work and at the same time, the compan ship of various workers will maintain the enthusiasm of the gr

The rationale behind farm development is the long term efit that the farmers will get from the effort. Soil conserva measures such as rockwalling, contouring and tree planting activities that do not yield benefits to the farmers overnight. farmer has to feed himself and his family members today w waiting for positive results to come. Long term benefits not solve his present requirement. Most upland farmers are ready caught up in this cycle of the problem. Foremost is his for daily food supply. Hence, farm development on the basi own-household labor provision will not achieve the result wi a given time frame. Once there is a competition between me the short and long term needs, the former always prevail. L will always be utilized first for the provision of goods that needed immediately. Only when time allows that a portion o labor shall be used for long term consideration. In short, anyt that is for the future is given the second choice. Most often choice is not properly implemented or not implemented a Since farming development in the upland is largely future or ed, it is destined to fail in almost all instances. Certainly contractual approach will solve the problem.

Contractual approach takes a very strong consideration recognition of the immediate needs of the upland farmers wh tries to take into account the future demands from the popul It is an objective recognition of the fact that the farmers' c

ving priority to meeting immediate needs is a result of the evaluation of his household needs. The farmer does not the hay when his horse is already dead.

The upland farmers cannot be blamed for this. It is our responsibility as academicians, researchers or policy makers to put feet into their shoes so we can appreciate their needs. Some- development theories are unreasonable and irrational. Gen- development has to come from within and as such the clien- communities should pay the prize of development so that they value what has been developed. Why should a farmer be paid developing his own farm? This would mean dole out. This make contractual agroforestry development, counter devel- ment.

already have outlined earlier my argument why conractual restry development provides an effective alternative strate- our upland development efforts. In this section may I finally wn my last arguments.

was argued that contractual agroforestry scheme is not a . First, dole outs are largely short term oriented and they include consumable goods. Second, the needs considered rt-term and hence there is no chance for those goods to have ltiplier effect on the community. Third, the impact is limited, focused at a particular good made available to the clien- rmer.

The proposed contractual approach in agroforestry develop- does not share the characteristics of dole out which I have . First, contractual agroforestry takes into account long nefits to the farm and to the household. Development in- the farm will continue to help conserve the soil and its and rehabilitate the ecological characteristic of the farm. ments such as rockwalls, contour hedgerows, contoured and the fruit trees planted are permanent capital invest- in the farms.

While these developments are permanent on the farms, they ltiplier effect in the long run. Anything that will be by the farmer right on his own farm as beneficial will not

surely be abandoned; instead, will have a good chance for expa sion. Slowly, it will cover wider area over time. Since this kind development will grow on a cumulative basis, its multiplicati effect on the farm will take place in the future. What we need do is to start the development process and let it happen and wo right on his farm. He will do the rest for expansion.

As the development on his farm takes place, other aspects of his life will be affected. Diet will improve, material possessio begin to accumulate overall health condition will be better, se of security and satisfaction begins to develop, and the over well-being is enhanced. Its effect is multifaceted unlike the eff of a particular dole. The question we now ask is: W is the result of this scheme in our own experimentation?

Results of Field Experimentation

Agroforestry development is experimented on two sites. O in Lake Balinsasayao and the other in the Negrito area in Ca guhub, Mabinay. One major component of the program is the pr er use of the hilly lands. This consists of the introduction of c trol mechanisms that will hold both the soil and its fertility. T contractual approach was not used in the Lake Balinsasayao s in the Negrito site, the method is employed. The reason were ready indicated earlier.

Toward the end of 1986, the accomplishments on the establi ment of soil protection mechanisms were assessed. The length contoured hedgerows, canal system, rockwall, terrace and ot related soil protection practices were measured in the two s The number of farmers employed and the area of the farms de oped were also recorded. The result of this exercise is shown Table 1.

Table 1 shows that, in absolute terms, the Lake Balinsas site has more cooperators working on a larger hectare comp to those coming from the Negrito area. This is expected since m farmers are involved in the former compared to the latter. W the population is bigger, the land area involved is also bigge Lake Balinsasayao. Here, the program is operating on a 300- tare land surrounding the Lake (Balinsasayao). It has more t 70 farmer-cooperators.

Table 1

Extent of Accomplishment In the Introduction of Various Soil Control Devices Between Two Sites Using Two Different Approaches

	Lake Balinsasayao (Non-contractual)		Negrito Area (Contractual)	
	No. of farms	Land Area involved(Ha.)	No. of farms	Land Area involved (Ha.)
ured ows	13	11.16	2	2.5
ured system	1	.33	5	6
ured	15	11.31	7	7
ured ace	1	.50	1	.5
ured System	3	1.25	0	0
Farmers	33	24.55	15	16
per person		.74		1.1

The Negrito component, on the other hand, has only 18 families involved, operating on a 21-hectare piece of land. Such difference in scale must have provided a more personalized contact between the farmers and the field personnel in the Negrito project compared to that of the Lake Balinsasayao site.

However, a glaring difference is reflected. In Lake Balinsasayao, only around 47% of the cooperators have introduced the soil control mechanisms in contrast to 83% among the Negritos. In terms of land area, the Lake Balinsasayao site has only involved around 24% of the total land area occupied by the farmers while in the Ata site, we have covered around 76% of the total land area.

The more convincing indicator for the positive effects of contractual agroforestry development scheme is the occupation rate of farmers on developed farms (i. e., with soil protective inputs.) The occupation rate per farmer in Lake Balinsasayao is only less than a hectare (around 7,400 sq. m.); in the Ata area the occupation rate is larger by around 35% to that of Lake Balinsasayao. On the average, a Negrito who has introduced soil conservation measure developed around 10,100 sq. m. This shows that the contractual approach must have improved the performance of the Ata farmers. If the approach worked very well among the Negritos, there is no reason why this will not work among the lowland Malay Cebuanos. More impact can be expected from the latter population group.

An intensive study on the Ata scheme in farming development was implemented and a number of findings are worth sharing in this paper. The cost analysis and the comparative performance of the male and female labor sectors have to be noted; they provide the support in planning this labor intensive activity among the tribal population. Cost analysis is likewise implemented in order to determine the viability of the contractual approach.

In order to measure the relative labor cost in the construction of soil protection devices (rockwall, canal, hedgerows, terracing) number and sex of workers were noted as well as the total num

of hours spent by the workers. To see whether land size of farm will have an effect on the construction of these devices, attempts were made to correlate these variables (see Table 2).

Using ±.5 as an acceptable level of correlation coefficient, Table 3 shows the variables that are affecting each other; hence, can be used as predictor for the other variables.

Table 3 suggests that the total number of workers does not necessarily indicate the total length of soil protection installed on the farm. Its correlation coefficient does not reach our acceptable level (see Table 2). Instead, a higher correlation coefficient is shown between total number of hours spent and the total length of soil protection device installed (r=.5561). This is expected since work efficiency is actually measured in the total number of hours spent by each worker rather than on the total number of people *per se* who may not work fully during the working session. This suggests that a huge number of workers does not necessarily, quarantee to yield a huge output. Instead, it is the workers' efficiency in using their time productively that determines the output. There must be a possible threshold point for optimum number of effective working force, beyond which output may begin to decline. It should be noted that control becomes more difficult as the number of workers increases. Table 3 shows the regression equation between the total length of soil protection device installed and the total number of hours spent by the workers in the installation of these soil protection devices.

When the total number of hours spent were disaggregated according to sex participants, the data showed very low correlation between the total number of hours spent by the males and total length of soil devices installed (r=.4492). On the other hand, when the total length of soil protection devices installed were correlated with the total number of hours spent by the females, a higher correlation was yielded (r=.5790). This suggests that female workers are more efficient than the males in constructing soil protection devices. For practical considerations, it is more effective, therefore, to include women in the working group. In fact, the data seem to suggest that the more female workers we

Table 2

Correlation Matrix Between Variables Related to the Construction of Soil Protection Devices

	LCHR	LCCS	LCRW	LCT	TLSPD	ASPD	TNW	NMW	NFW	TNHS	NHSM	NHSF
LCHR	1.0000											
LCCS	-.1833	1.0000										
LCRW	-.1632	.2911	1.0000									
LCT	-.0464	-.1238	-.0167	1.0000								
TLSPD	.0025	.8403	.6982	.0222	1.0000							
ASPD	-.1666	.4032	.6364	-.1243	.5818	1.0000						
TNW	-.3655	.3391	.5770	.0654	.4879	.6959	1.0000					
NMW	-.3995	.1833	.4029	.0822	.2776	.5441	.9388	1.0000				
NFW	-.2678	.4690	.6908	.0354	.6583	.7646	.9143	.7189	1.0000			
TNHS	.1082	.5207	.2821	-.0717	.5561	.1042	.1079	-.0321	.2554	1.0000		
NHSM	.2328	.4419	.1322	-.0695	.4492	-.0464	-.0929	-.1874	.0328	.9548	1.0000	
NHSF	-.2296	.4952	.5155	-.0511	.5790	.4211	.5378	.3509	.6729	.7080	.4675	1.0000

LCHR = Length of contoured hedgerows
LCCS = Length of contoured canal system
LCRW = Length of contoured rockwall
LCT = Length of contoured terrace
TLSPD = Total length of soil protection device
ASPD = Area of farm installed with soil protection
TNW = Total number of workers
NMW = Number of male workers
NFW = Number of female workers
TNHS = Total number of hours spent
NHSM = Number of hours spent by males
NHSF = Number of hours spent by females

more in a working group, the more output it can produce. The total length of soil conservation installed has a correlation coefficient of .6583 with the number of female workers in contrast to only .2776 with the number of male workers. Female working group is therefore cheaper to operate than male working group among the Negritos. The female workers tend to be more dedicated and conscientious in their work compared to their male counterpart. This is partly a product of their tradition. Negrito men are largely travelers (hunting and collecting or gathering), while the women are generally associated with maintenance in horticulture.

Table 3 shows that the best predictor for the total length of soil protection device installed is the total number of female workers in the working group (r=.6583) and followed by the total number of hours spent by the females (r=.5790). The regression equation in Table 3 shows that for every unit of increase in the total number of hours spent by the females, the length of the soil protection device increases by almost three units. On the other hand, the total length of soil protection device increases by around 13 units for every unit increase in the total number of female workers in the working group (see regression equation in Table 3).

Larger farms tend to have more soil protection devices installed. The regression equation in Table 3 suggests that for every unit increase of land area, the total length of soil protection device installed would increase by more than 269 units. Therefore, we can expect that owners of larger farm areas will tend to employ more labor in order to cover larger protected area from erosion. There is a high correlation between area of farm protected from soil erosion and total number of workers employed (r=.8858). It can be predicted that for every unit of increase in the total area of land covered with soil protection devices, the total number of workers needed to construct soil protection devices increases by 13 units. This includes both male and female workers. However, there seems to be a higher need to increase female workers (r=.7646) than to increase male workers (r=.5441) in

Table 3

Selected Variables with Various Levels of Correlation Coefficient.

Variables		Correlation Coefficient	Regression Equation of Selected Correlated Variables
Y	X		
LCCS	TLSPD	.8403	-
LCCS	TNHS	.52007	-
LCRW	TLSPD	.6982	-
LCRW	ASPD	.6364	Y=45.44 + 160.58X
LCRW	TNW	.5770	-
LCRW	NFW	.6908	Y=35.13 + 18.40X
LCRW	NHSF	.5155	Y=61.00 + 1.32X
TLSPD	ASPD	.5818	Y=115.25 + 269.29X
TLSPD	NFW	.6583	Y=92.87 + 32.16X
TLSPD	TNHS	.5561	Y=103.36 + .88X
TLSPD	NHSF	.5790	Y=123.74 + 2.72X
TNW	ASPD	.6959	Y=8.61 + 13.31X
NMW	ASPD	.5441	
NFW	ASPD	.7646	

achieve a given unit or increase in the land area covered protection devices. This is expected since female workers be more efficient than the males, as we noted earlier.

There is a general tendency for the Negritos to select less intensive soil control measure. One can have high predict- of having contoured canal system introduced given a total of installed soil protection device (r=.6982). Rockwall uction is more labor intensive than the construction of con- canal systems.

The construction of rockwall is generally associated with big- area. The larger the farm area, the more likely that farm rockwalls (r=.6364). This is expected since the larger farm area, the more likely you will find portion of the land Negrito area with adequate rocks for rockwall construction. n equation shows that for every unit increase in land alled with soil protection, there is 160-unit increase in ngth of rockwall.

There is a higher predictability for longer construction of with female working group (r=.6908) than with other- p (r=.4029). This consistently proves that the women productive than men. This is further strengthened by that we find a fairly good correlation between length of constructed and the number of hours spent by women compared to that we found for men (r=.1322). For unit of increase in the number of female worker, we can an increase of around 18 units in the length of rockwall ed (see regression equation in Table 3). Furthermore, unit increase in the number of hours spent by females, also one unit increase in the length of rockwall cons-

The combination of female and male working groups still a good predictability for the length of rockwall cons- It is obviously the high efficiency level of the women e of their time that improves the overall performance rking group, i. e. composed of men and women. With

women, the men can improve their performance tremendously. For practical consideration, the women should be part in th working group.

Within the involved area of approximately 16 hectares, 9,0 meters long of soil protection devices, were installed; 5,366 ma hours were spent for constructing rockwall. Around 27% these manhours were provided by women and the rest by me Assuming that only eight manhours were spent per day to con truct this soil protection device, the total device must have take around 671 man-days. This indicates how labor intensive th development activity is. At a subsidized daily wage labor of t persons a day, the soil protection device spread out in a hectare piece of land must have costed around ₱6,710.

Collective labor is very essential in this development effo to shorten the construction time period as well as to elimina the boredom associated with slow moving labor intensive j Our data show that of the 41 cases of plots studied, each p employed approximately 14 workers, on the average. This mea the job which should take 671 man-days to complete, was on completed by the Ata in 48 days using the contractual meth This is approximately 1½ months.

This suggests that the more workers on the farm, the bet However, one should be very careful with time use manageme Earlier, discussion showed that it is not necessarily the num of workers *per se* that determines the extent of accomplishm of the working group. Rather, it is the amount of time t each worker actually spent in working. A manager sho keep the size big enough to manage, so that each worker optim the number of hours spent in working. He should know w size he could afford to manage effectively.

In our Ata experience, the women perform better than m Hence, a working group should have women to maintain cer level of efficiency. However, men still serve as the core grou the construction of soil protection devices. The women consti ed only around 28% of the working group. The rest are me

To construct a rockwall including the determination of the contour line, the collection of rocks and the establishment of the rock base take approximately one man-hour for every half meter long. The rockwall should be around 2 ft. wide and around 3 ft. high. On the other hand, to put up a hedgerow including the determination of contour line and the planting of plant hedges, takes around one hour per seven meters.

For contour canal system and contoured terracing, 4 m./hr. and 3 m./hr. are produced, respectively. This includes the determination of the contour line and the planting of the necessary border crops.

However, the choice between these techniques is not necessarily determined by the relative cost differential in the installation of these soil protection devices. A host of factors are taken into account, such as the slope of the farm and the availability of rocks. In farm sites where rocks are abundant, rockwalling is preferred despite its cost since removal of rocks and piling them systematically will increase the planting spaces of the farm. While it is true that rockwalls are costly to construct, they are, however, durable. Hence, rockwalls tend to stay more permanently in the farm compared to terraces or canal.

Summary and Recommendation

The data have convincingly showed that the installation of soil protection devices is labor intensive. As such, it is costly. Realistically, farmers actually need outside support in order to provide this input. Since such input is lasting and non-consumptive, its results will be permanent. Since it is a permanent change in the farm, such outside support does not necessarily contradict the principle of development from the inside-out.

Sex composition of the working group seems to have an effect on working efficiency among the Negritos. If this finding has a wider geographical and ethnic implication, it is recommended that a working group should have women, in addition to men, as members.

Among the four soil protection devices introduced, con toured rockwall is the costliest while contoured hedgerow is the cheapest. However, the selection among the four techniques tried among the Negritos should not necessarily depend on cost but on other factors such as slope and the availability of rock on the ground. While rockwalling is the costliest, it is however the most permanent of all the systems if constructed very well.

By necessity, labor has to be pooled together to shorten the time period required to install soil control devices. Pooling labor can be more effectively done with the use of minimum cash. For an area of around 16 hectares we spend only around ₱7,000 to construct the necessary soil protection devices. It is cheap in the context of permanent farm development. It is an investment for a permanent change on the farm with long lasting effect on the lives of the upland population.