

Chapter 7 Conclusion, Recommendation and Future Proposal

7-1 Conclusion

7-1-1 Eco-technology approach to sustainable sawah development in Inland Valleys in Ghana

During this joint study, the project tested various types of sawah systems including rainfed, pump, spring, weir and canal and integrated types (Table 2), adapting in diverse reliefs, soils and water conditions. Participated farmers groups play major role for the on-farm testing of various types eco-technologies. As described in Chapter 6, based on the various participatory on-farm experiments and evaluations on various sawah eco-technologies, the project could propose the following new eco-technology and loan based sustainable small scale sawah development for integrated watershed management of Inland valley in Ghana and West Africa. Although following proposal is a draft, it can be improved and consolidated through continuous field practices and dialog with participating farmers.

Possible funding for sawah development to make the eco-technology approach sustainable in Ghana and West Africa

- 1, Call for sawah group formation of about 10 farmers
- 2, \$6,000 loan for one group: breakdown
 - \$4,000 for power tiller
 - \$500 for tools for development and rice cultivation
 - \$500 for small pump
- \$1,000 for annual running cost including fuel, spare parts, fertilizer, sand bags and pesticides
- 3, Provision of free technical advice, on the job training and education. Institutional backstopping to facilitate such technical advice. The development of sawah system for rice cultivation by sawah group without external assistance.
- 4, 1 ha of sawah development; 5ha per five years during the five years of no loan payment. During 6-11 years, loan payment with 5% interest (Note: in the case of African bank loan, no interest is necessary to pay). Total payment will be \$7,050 and annual mean payment will be \$1,175.
- 5, 1st year income will be \$1,350, assuming a rice sale of \$ 1100 from 3.5t/ha and dry season vegetable of \$200.
- 6, 2-5th year: total sales will be \$2.600-6,500 and running cost, \$600- \$1000 annually.
- 7, 6th year: yield will increase to 4.5t/ha, vegetable production will also increase by same rate. Then total sales will be \$7,300 per group. The net income will be \$5125 after paying mean annual loan, \$1,175 and depositing the necessary annual running cost, \$1,000. Mean annual income per each farmer will be \$500 (currently about \$250).
- 8, Continue to produce more sawah up to about 10 ha. Then annual income will be \$1,000.
- 9, During the project period, plots of multipurpose tree species and other useful trees are enlarged. Fishponds are constructed and tilapia, catfish, etc. are cultured there.

7-1-2 Participant Farmers' Response to the sawah approach by March 2001

All participant farmers, 100%, showed a strong interest to join the proposed project in order to increase their income and job opportunity. None of the farmers, however, have used loans in the past. Many farmers, 54%, responded that the amount of the loan, \$6,000 is too high, compared to their present mean annual income of about \$250. With regards to the construction work, although the majority of farmers, 90%, said that they will be able to continue work if small support, such as food, (1000cedi = 0.3dollars), is available, they strongly prefer the payment of the labor cost during the sawah construction work.

Farmers thought that if other farmers knew about the sawah activities, they would be attracted by the proposed project. Now farmers who have interest in the sawah are rapidly increasing. Farmers who have experienced upland rice cultivation will easily confirm the superiority of the sawah rice farming. This proposal is further more fascinating because of the loan for power tiller and pumps. Although they have to pay back, they can own all of it in future. This proposal makes what was thought impossible possible. It also seems to open before them a life of higher purchasing power very different from the present one of rural insufficiency. They thought the proposal will be a gate way to solving the present extreme poor conditions of village life.

However the breakdown of the power tiller will be a severe problem. Some special measures should put in place to cater for machinery troubles and abnormal low yields. To develop 1ha per year by one group will need very hard work. They were worried about the fluctuation of rice price and whether it was possible to find enough labor even after full operation for five years. Since sawah is quite a new technology for the farmers, they felt that technical advice alone might not be enough. More systematic training or the On the Job training will be necessary. The income is very satisfactory, but we have to consider the harshness of the work. Our past successes were only possible because of the help of Japanese and Ghanaian experts. Farmers insisted on getting the food help during the construction work.

7-2 Recommendations and Proposals for Sustainable Inland Valley Development

7-2-1 Application of the eco-technology approach to sustainable sawah development in Inland Valley in Ghana

This participatory eco-technology approach to sustainable sawah development in Inland Valleys in Ghana and West Africa can make an impact on the economy of Ghana and West Africa as a whole, if the following recommendations are considered

- (1) Ghana government has plan to develop 5000ha of sawah in various parts of inland valleys in Ghana with an amounts of 20million US\$ loan from Africa Development Bank (AfDB). This approach will be an option to examine.
- (2) Since major investment is to buy small power tiller to develop sawah, KR-2 donation by Japanese government will be another option to integrate the eco-technology approach.
- (3) Based on the results of this joint study project, it is propose to examine the possibility of new approach for the Project Type Technical Cooperation between Ghanaian/West African on one hand and Japanese government on the other.

Since the essence of the participatory eco-technology approach is a training and education program in the fields, new types of technical cooperation have to be developed to integrate the following components.

- (i) Institutional backstopping to facilitate the training and education for sawah development,
- (ii) Integrated technical cooperation in agronomy, engineering construction, and environment,
- (iii) KR-2 donation for sustainable agricultural developments,
- (iv) Loan based projects of JBIC, AfDB, USAID and/or World bank, and
- (v) Asian African collaboration by examining the best power tillers and sawah development.

7-2-2 Follow up study, training and development

7-2-2-1 Adoption and technology transfer of Sawah approach to Ashanti region and Ghana

- (i) Follow up of the Benchmark sites: Club-C and others, Biemso No.1 sawah group and others, Biemso No2 sawah group and others: March 2001 – March 2002: Support by Shimane University/SRI/CRI and District office in collaboration of the project members.
- (ii) Expansion and training to surrounding area, district, region and whole Ghana
 - a) March 2001 – March 2002: technical assistance to district extension office at Mankranso

- b) March 2001 – March 2004: Proposal to MOFA's Agricultural Development Program: Demonstration, training, and technical assistance to Ashanti region and Ghana
- c) Proposal to Sasakawa Global 2000 or other relevant NGOs

7-2-2-2 Follow up research: March 2001 – March 2004+

- (i) Integrated agroforestry research and training in Ph.D. program: FORIG/JICA/Shimane University
- (ii) Soil and Water Characterization at Biem/Dwinyan river watershed in relation to Ph.D. and Master program :SRI and Shimane University
- (iii) Plant nutritional study in benchmark watershed in Ph.D. program: CRI and Shimane University
- (iv) Selection of Rice varieties and the improvement of farming systems in relation to Sawah approach in Ph.D. program: CRI and Shimane University: Need the assistance of JICA's training program like (i).
- (v) Integrated Watershed Management and the Monitoring of various sawah systems by IVC of WARDA

7-2-2-3. Next Step Research Proposal based on the JICA/CRI joint study for wider applicability in another ecology

- (i) Western region, or
- (ii) Northern region, or
- (iii) Upper East region