AQUACULTURE WITHOUT FRONTIERS

PROJECT PROFORMA

SECTION 1: Project Outline

Project title:	**AwF – Nepal: Empowering women through aquaculture and vegetable gardening in rural areas**
Proponent's name:	Dr. Ram C. Bhujel
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Proponent's organisation:	Asian Institute of Technology (AIT)
Project Number:	Assigned by AwF
Country/ies:	Thailand

Administrative Contact:	
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Position	President
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Funding request (totals for each year)

Year 1	**Year 2**	**Year 3**	**Year 4**	**Total**
5,000	4,259	-	-	**9,259**

Funding support from contributing agencies/individuals (totals for each year)

Year 1	Year 2	Year 3	Year 4	Total
2,634	1,016	-	-	**3,651**

Project Duration:	24 months
Proposed Start Date:	March 1, 2008
Proposed Finish Date:	February 28, 2010

Key Contacts:

Project Leader: Partner Country	
Title and Name	Dr. Madhav K. Shrestha
Position	Chair, Aquaculture Department
Organisation	Institute of Agriculture and Animal Science, Chitwan, Nepal
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Email	madhav_shrestha2003@yahoo.com
Address	Aquaculture Department, Institute of Agriculture and Animal Science (IAAS), Rampur, Chitwan, Narayani Zone, Nepal

Collaborators:	
Title and name	Mr. Khag Raj Nakhola
Position	Chairman
Organisation	RDC-Nepal (Raginastar Development Committee – Nepal) - a local NGO
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Postal Address	RDC-Nepal, Panchbhai Chautara, Ward no. 3, Dhamilikuwa VDC, Lamjung District, Gandaki Zone, Nepal
Street Address	Same as above

SECTION 2:
Project Summary

Malnutrition, especially shortage of protein and vitamins, is a serious problem in rural Nepal. Various reports show that about 90% children suffer from one or more forms of malnutrition. Women work hard but still their value of work has not been recognized. A pilot project called "Women in Aquaculture" was launched jointly by AIT and IAAS in Chitwan and Nawalparasi districts (southern plain, Terai) of Nepal to address these problems. It has been very successful. Using the same idea and experience, the Project Team, consisting of three aquaculture experts, proposes to test a similar pilot project in a lower mid-hill area. A village called "Raginaster" in Lamjung District of western Nepal has been provisionally selected where there is an irrigation canal for water supply even during winter season. Two groups of women farmers will be formed (approx. 25 per group). Training on fish farming with vegetable gardening, and full technical and partial financial supports (50%) for pond construction will be provided. The project team will also assist in procuring the fish seed and help in harvesting as well as marketing. The village will be developed as a "Model Village" for mid-hills in which women's group will play active roles. Upon the successful implementation and completion of the proposed project, it is expected to produce fish for consumption (~ 20 kg/family/year), generate supplemental income (~US$100) by utilizing under-used land, labour and farm byproducts. In addition, the project aims to bring some social change and develop as a gender balanced society. Attempts will be made to disseminate the idea via TV, FM radio, magazines, newspapers, internet and other mass media so that it would go country wide as a campaign.

SECTION 3:
Project Justification and Methods

3.1 Background and Justification

In Nepal, about 85% (of total 26 million) people live in rural areas relying on subsistence agriculture and 60% of them suffer from food shortages for 4-6 months every year. Due to limited employment opportunities and income generating activities, majority men migrate to cities in or outside the country to earn some cash. Women stay at home struggling to feed their kids and other family members get enough food. They grow mainly rice, some vegetables and also raise animals. Due to decline in pasture land, raising animals has become difficult as it consumes considerable time for collection of fodder and feeding/pasturing). Meat is becoming more scarce and expensive. Cereals and root crops are the main food items of regular diet. Of the total protein intake, a person should get at least 33% from animal sources for good health but it was only 16.3% in 1989/90 which declined alarmingly to 12.4% in 1994/95. UNICEF data shows that more than half (51%) of the under-five children

are suffering from moderate to severe stunting. It has also been reported that 90% Nepalese children suffer from one or more forms of malnutrition and about one-fourth Nepalese die before the age of 40 years and half of the deaths are associated with malnutrition. Rural women are less aware of family planning. They don't bother to think about how an additional child can add economic burden to the family and also affect the nutritional status of whole family members. More than half (57%) Nepalese women are still illiterate and the proportion is even higher in rural areas due to which they are left behind. Their situation became more critical due to "decade-long internal conflict". In fact, the root causes of the conflict were rural poverty, lack of food security, discrimination against women, and exclusion of rural minority/lower caste groups from the development process and societal/political activities. There is an urgent need to address these problems and initiate inclusive developmental activities from the beginning of the post-conflict as rural Nepalese have a big hope from on-going peace process. If these are not addressed there is a danger of repetition of such conflicts.

It is true that small-scale aquaculture or rural aquaculture has played significant role in accelerating rural development in many countries. Unfortunately, Government of Nepal did not realize its role in the past. Promotion of aquaculture was tried earlier in 1980s with ADB funding with the recommendation of 2,000 m^2 as minimum pond size thought to be economically profitable. The idea could not reach to the rural areas and to the poor people as the recommended size of the pond was too large and was difficult to manage by the resource poor families. By learning lessons from the past, our team is promoting small-scale aquaculture recommending 200 m^2 ponds (1/10th in size) which can be constructed by the side of the family house. This idea has been tested forming groups of vulnerable women in rural villages, organizing training and arranging monthly meetings. All of these have increased women's participation and helped to enhance their capacity to help themselves. In the past, the role of small-scale aquaculture was not realized in Nepal. But in Bangladesh, it has been well-established in the form of "Fisheries Model Villages" which serve as demonstration fields or information sources.

The on-going pilot project in two southern districts of central Nepal has been successful in addressing the problems of malnutrition and food security, low income and lack of participation of women in social activities prevalent in rural areas. The project team; therefore, plans to expand its activities to a mid-hill village and also spread the idea of Fisheries Model Villages throughout the country using mass media by bringing out the success stories of model farmers for the benefits of larger population.

The goal of the project is to improve rural food security and increase income through small-scale aquaculture with vegetable gardening by empowering ethnic women and establishing fisheries model villages.

The **specific objectives** of the proposed project are to:

- establish an "AwF - Model Village" and two women's fish farming groups
- train women in small-scale pond fish culture
- assist in constructing fish ponds

- provide a promising alternative source of animal protein, minerals and vitamins for the rural communities
- assist women to earn supplemental income while working at home
- increase women's participation in social activities
- introduce an idea of nutrient re-cycling avoiding external inputs in which fish are fed with kitchen wastes and farm bye-products, and pond-water is fertilized using animal manure to grow natural food which can also be used to irrigate vegetable garden
- to disseminate the project idea to mid-hills that cover over two-third of the country

3.2 Project Context (relationship to other activities)

AIT launched "Women-in-Aquaculture" project jointly with IAAS (Nepal) in two districts of central plain (Terai) in Nepal in 2000. The project was initially funded by WDP-German Committee, a German NGO. The project has so far trained five groups of about 150 women belonging to a marginalized ethnic group and supported for fish farming as a source of protein supply for their families and an additional income. The project has, not only addressed the problems of malnutrition/food security and low income but also increased the participation of women in social activities among ethnic minority groups living in rural areas. The pilot project has been; therefore, considered one of the most successful projects in Nepal and its site has been popular for visits by farmers and officials of many government and non-government organizations. More importantly, in contrast to previous notion prevailed in the country, it has provided an evidence for policy makers that fish can also be cultured economically in small ponds. Using this experience, the Project Team wants to expand other parts of the country especially in rural hilly areas, for the benefit of larger population by establishing "Model Villages" because Terai covers only about 17% while the hilly areas cover almost two-third of the country. Before disseminating the idea tested in Terai plain only, there is a need to test the model and make necessary modifications to suit hilly areas. The proposed project would provide this opportunity and even may play a key role or a breakthrough in the development of small-scale aquaculture in rural hills of Nepal. Until now, pond fish farming (94%) in Nepal is in the Terai. Except few cases, pond-fish culture has not been expanded to mid-hills due to fear of low water temperature, especially in winter. To overcome the problem ponds will be dug deeper (approx. 2 m) to keep water warm, covered pond by plastic sheets during night and/or stocking will be scheduled so that fish can be harvested before the start of the cold season. In the provisionally selected village two farmers had tried common carp last year and are in the opinion that culturing fish is possible there but have expressed that if many people do it in groups could be seen as a good progress. The Project Team, plans to have two groups so that Carps and Nile tilapia would be compared for their growth and economic performance.

Attempts will be made to link with an AIT's Aqua Internship project funded by EU under Asia Link programme. The internship project has been recently launched (September 1, 2007) and will be for at least 36 months. For this project, IAAS, Nepal is one of the four Asian partners. Under this project, Eight European students will have opportunities to come to Asia for internship. There might be a possibility that 1-2 students join with the project to assist to / learn from the local communities. At the same time, the EU project supports at least 9 (3/year) M. Sc. students of IAAS to work in the real field for their survey research or

developmental work as a part of their degree program. We plan to send at least one IAAS student for this project (please see 3.5 Travel Table) from IAAS and possibly another from Europe. Travel and all other costs of these students, as well as the Team Leader, will be covered by EU project.

3.3 Detailed Methods/Strategy:

The project will be launched by AIT jointly with IAAS and RDC-Nepal (local NGO) as shown in Fig. 1. The Team Leader, along with the Technical Expert and Student Intern from IAAS, will attend the project kick-off meeting in the local village and will be in contact via direct telephone line with the Local Coordinator/Secretary. The Technical Expert and the Student Assistant from IAAS, Nepal, will be visiting the village more frequently and will also be in direct contact with the Team Leader at AIT. More importantly, an M. Sc. student / intern of IAAS will spend his time in the village to assist the community from the time when the farmers start digging ponds by the time he finishes his one-year course work and starts working on this as his thesis project.

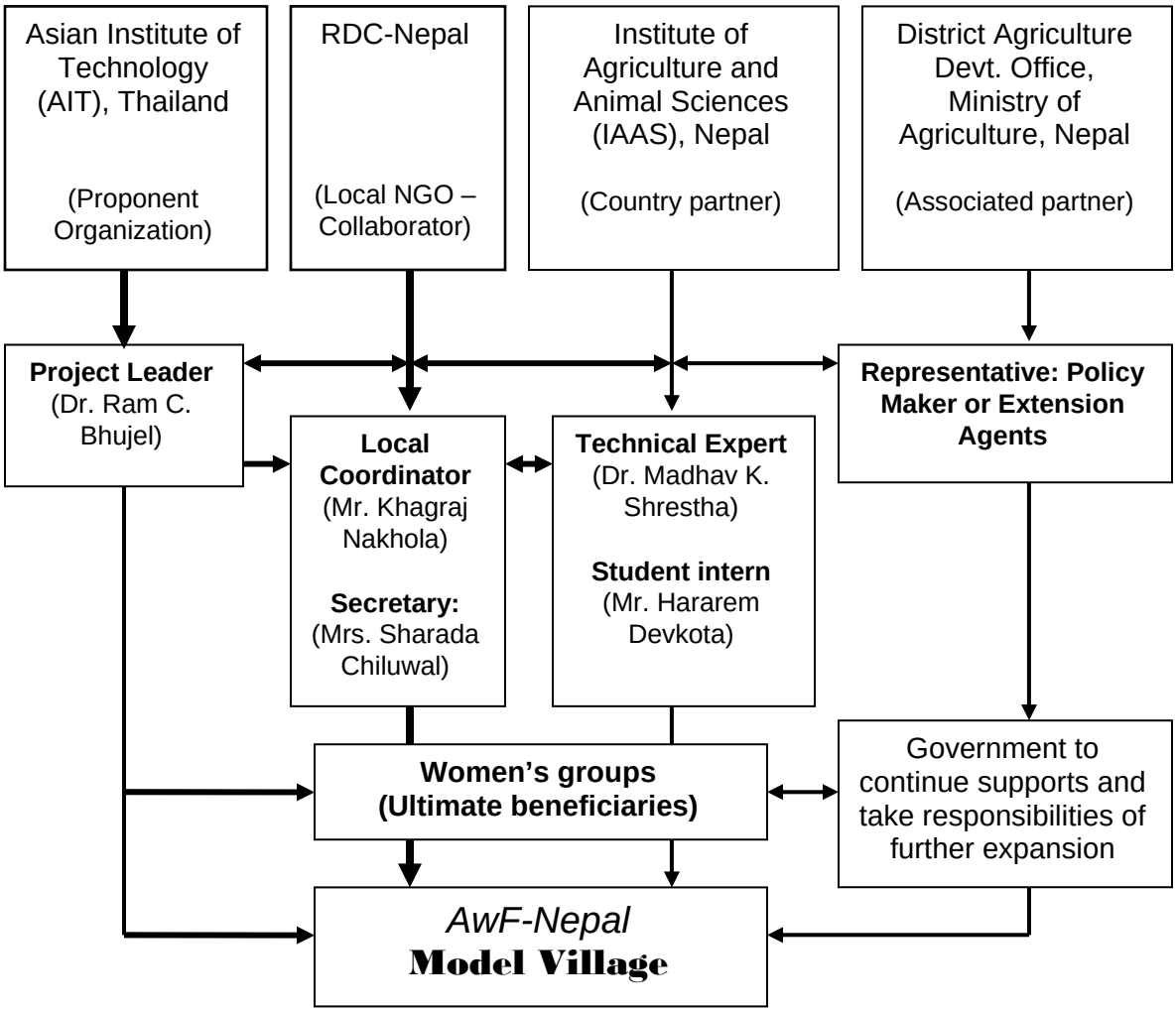

Figure 1. Organizational structure and linkages with organizations to be involved.

The Project Team will use the same method, which was used in Chitwan and Nawalparasi (Nepal) for the proposed project and test the idea in a village located in lower mid-hills. The steps planned for the implementation of the project are as follows:

a) Month 1-3: A village has already been identified to develop as a "Model Village". Project will be started by signing an MoU between AIT and the IAAS-Nepal. An Aquaculture expert, post-graduate Student Assistant, a Local Coordinator and an Assistant will be hired. A kick-off meeting/workshop will be organized in the village involving project steering committee members and others to be involved in the project team in order to further discuss and prepare specific schedule for the planned activities.

b) Month 4-6: Fish farming manuals (at least 50) will be produced to distribute to the women families selected for the project. A follow-up visit will be paid and selection of women farmers will be initiated.

c) Month 7-9:

i) Two women's groups comprising of 25 members in each group will be formed.
ii) The Project Team will provide training on farming fish together with vegetable gardening on the dyke. Each farmer will receive a copy of the manual and training covering the followings:
    - methods of construction of pond and vegetable garden
    - stocking and taking care of fish e.g. feeding
    - knowledge on how the fish ponds and vegetable garden can be managed together by recycling the nutrients within the system
    - keeping the records of inputs, outputs and health related indicators

During this phase, construction of few ponds with vegetable garden will also be initiated so that women's group can visit the site and see. Then all others will be asked to start construction of ponds and the vegetable garden immediately after the training using the skills gained from the training.

d) Month 10-18: Once the ponds are ready, Project staff will assist in procuring fish fry and stocking into the pond. Farmers can start partial harvest for home consumption or sell after about 3-4 months of stocking whenever they want/need to do so but they will be asked to keep the records in their log-book.

e) Month 19-24: Farmers start final fish harvest in groups rotationally. The Local staff and community leaders will assist and monitor the activity and keep the records. All the data from their log-book will be collected and compiled. Stakeholders' meeting/workshop will be organized and pre-reports will be presented. Final report will be prepared and submit to AwF, AIT, IAAS and other concerned authorities.

3.4 Methods and Outputs Table

Objectives	Methods/Activity	Outputs	Timeline
1. Form women's fish farming groups	Kick-off meeting, RRA/PRA at the village to initiate and select families based on the area or cultural background	2	within 9th month
2. Produce fish farming training manual (in local language)	Revising and reprinting of the manual used for training for the existing project farmers and distribute during training	50	within 6th month
3. Provide training to women in fish culture and vegetable gardening	Group training and demonstration on pond construction/preparation, manuring, fry stocking, feeding, harvesting and recording all inputs and outputs	50	within 12 months
4. Construct fish ponds with vegetable gardens	50% cost to support by the project and women to work in groups or mobilize family labour to construct their ponds	50	within 9th month
5. Produce and supply fish for family consumption	Stocking and growing fish for about 8 months, partial harvesting as per the need but they will keep all input and output records in a log-book provided	20 kg per family	between 16 – 24th month
6. Produce and supply vegetables for family consumption	Grow vegetables on the pond dyke using pond water and harvest as per the need but they will keep all input and output records in a log-book provided	100 kg per family	between 16 – 24th month
7. Generate income	Sell vegetables and fish in local market whenever cash is needed for the family	US$ 100 per family	within 24th month
8. Improve women's participation	Arranging monthly meetings, encouraging women to participate fish fairs and other social activities	Increased social activities	within 12th month
9. Establish a model village	Expanding the project activities in other sectors and creating a value / feeling of team work for the development of the village	1	within 24th month
10. Disseminate project outputs	Newspapers, magazines, internet, TV and FM Radio, etc.	-	within 24th month

3.5 Travel table

Person(s) or position travelling	Approximate dates of travel	From / to	Purpose	Duration
Dr. Ram C. Bhujel	Apr 11, 2008 Oct 20, 2008	AIT-Nepal	Implementation for EU internship project and technical support for AwF project	1 week/visit
Dr. Madhav Shrestha	Apr 11, 2008 Oct 20, 2008 At least 2 more visits – dates depend on the local situation	IAAS – Raginastar	Training and technical support	1 week/visit
Mr. Hareram Devkota (M. Sc. student / intern)	Apr 11, 2008 Oct 20, 2008 Others - at least 6 visits depending upon the situation	IAAS – Raginastar	Work as student intern to assist in implementing and monitoring of the project	He will spend about a year in the field for his M. Sc. thesis work or internship

3.6 Project personnel

(i) List of participants involved in the project

Name	Sex M/F	Agency	Position	Time in project (%)	Funded by
Dr. Ram C. Bhujel	M	AIT	Team Leader	10%	EU / AIT
Dr. Madhav Shrestha	M	IAAS	Consultant	10%	IAAS / AwF
Mr. Hareram Devkota (M. Sc. Student)	M	IAAS-Nepal	Student assistant / intern	50%	50% by AwF 50% by EU/ AIT/IAAS
Mr. Khagaraj Nakhola	M	RDC-Nepal	Local Coordinator	50%	AwF
Mrs. Sharada Chiluwal	F	RDC-Nepal	Secretary	50%	AwF
*European student(s) / intern(s)	Not known yet	EU partner Universities	Student intern	2-3 months	EU Project

*Attempts will be made to find and send European student(s) as intern (s) but not yet sure at the moment.

(ii) Summary details of the research capacity, skills and role of each participant and agency

3.7 Communication and dissemination strategies

The M. Sc. student to be involved in the project will write his thesis based on the project work, implementation and the outputs. Annual project reports will also be prepared and submit to AwF, IAAS and AIT. Attempts will also be made to publish articles in news papers and magazines. Wider dissemination of outputs will be tried by developing internet website, and by broadcasting on national radio, TV or at least local FM radios.

3.8 Intellectual Property and other regulatory compliance

Arrangement will be made for an M. Sc. student to fully work for this project and use data for his thesis with due acknowledgement. AwF, AIT and IAAS will have access/rights of using data for project reports and other forms of publication. Any issue in using data for publication will be discussed among the partners so that there will be no issue of intellectual property and any other regulatory compliance.

SECTION 4:
Project outcomes and adoption

4.1 Social benefits

Participation of women in training, other project activities and group meetings would enhance the status of women in the society. Increased income through fish and vegetable sales would further add value to their time and activities thereby the team work. The notion that “women have no income” will be changed to “women also can earn income” while working at home. This will help suppress discrimination against women. The proposed project will also encourage women to get involved in other social activities which would bring about some social changes. The women group would create its image and the status in the society. Ultimately, the whole village would benefit from being a Model Village for neighboring areas.

4.2 Economic benefits

Fish ponds can be constructed using unused and family labour which could be wasted otherwise. Once ponds are constructed, little efforts are enough to manage it compared to raising animals which consume a lot of time. Women can save considerable time to take part in social activities. Families can catch few fish for family consumption or for sale at any time and any day in contrast to the need of a whole village to slaughter a goat/swine. Culturing fish in ponds by the side of family house increases the amount and frequency of animal

protein intake in their regular diets and saves the expenditures on buying goat or chicken meat. Fish has often been considered as “Living Cash” and pond as “Saving Bank” because women can catch their fish any time they want and sale whenever they need cash, especially to spend for child education (fees and uniforms) and during festivals e.g. food items, buying new clothes. Through culturing fish, the pilot project in Terai has showed that up to US$50 per family per crop (8 months) from surplus fish is possible. Therefore, culturing fish together with vegetable will possibly double the income.

4.3 Environmental benefits

The small-scale fish farming will be introduced into the existing farming system integrating especially with vegetable gardening as in a pilot project in two districts of Terai. The idea has been successful and proven to be promising alternative. In this system (Fig. 1), nutrients are re-cycled, otherwise could be wasted, within the farming system avoiding the need of external inputs. Fish are fed with kitchen wastes and farm by-products. Pond water is fertilized using goat/chicken/cow manure to grow planktons which serve as natural food for fish. Ponds serve as storage for fertile water which can be used to irrigate the vegetables grown on the dike or nearby the land, and the vegetable leaves/stumps/peels can be used as inputs for fish ponds. As mosquitoes lay eggs in stagnant water and fish can eat their eggs/larvae, fish culture in ponds have also been used as control measures for malaria.

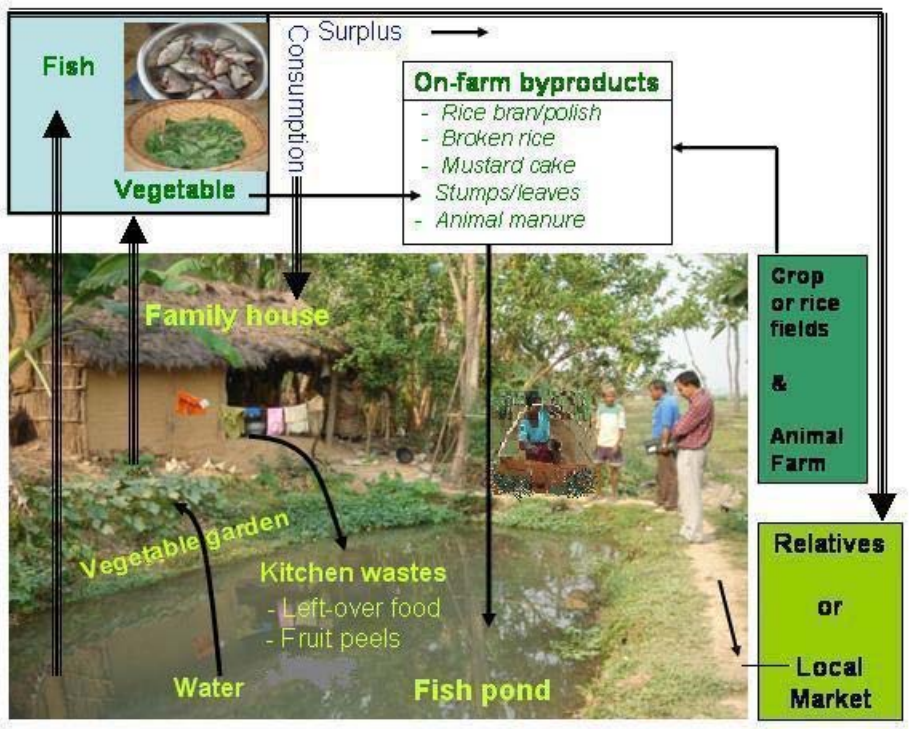

Fig. 1 Model tested in Chitwan, Nepal. The project team wants to test the same model and expand it in hilly areas which cover about two-third of Nepal.

4.4 Enhancement of capacity

The new idea will be implemented by establishing a "Model Village" and creating groups of poor women in rural villages, organizing training and arranging monthly meetings. All of these help increase women's participation and helped to enhance their capacity to help themselves. The project women's group would serve as model team work and the village itself can serve as a good example for other neighbouring areas. More importantly, testing a technology in clusters makes individuals to be cohesive and provide better chances of getting help from each other leaving less space for failure. The producers in clusters also get more strength/bargaining power for their products and more chance be connected to the value chain market. Once they become a part of the market they will be capable to sustain in the long-run.

SECTION 5: Budget

5.1 Requested from AwF.

Budget items:	Unit rate (US$)	Units	Total	Year I	Year II
1. Personnel					
1.1 Local Coordinator (part-time)	60	24	1,440	720	720
1.2 Secretary (part-time)	40	24	960	480	480
1.3 Technical consultant (per diem)	81	16	1,300	650	650
1.4 Student assistant (per diem)	15	40	600	300	300
2. Travel					
1.1 Technical consultant	70	4	280	140	140
1.2 Student assistant	15	5	75	38	38
3. Women's training			-		
1.1 Subsistence allowance	3.5	200	700	350	350
1.2 Training materials, hand book	2.5	50	125	125	-
4. Pond construction supports	32	50	1,600	900	700
5. Fish seed purchase	15	50	750	375	375
6. Fish seed transport	95	2	190	95	95
7. Stationeries	8	24	189	94	94
8. Communication	19	24	454	300	154
9. Miscellaneous	10	24	240	240	-
Sub-Total			8,903	4,807.0	4,095.5
10. Overhead (4% for AIT)			356	192.3	163.8
Grand total			9,259	4,999.3	4,259.4
Requested (rounded figures)				**5,000**	**4,259**

5.2 Contribution to project (AIT/EU contribution to combine with Asia Link project activities):

	Unit rate (US$)	Units	Total	Year I	Year II
1. International travel	647	2	1,294	647	647
2. Per diem	30	10	300	150	150
3. Local travel	39	2	79	39	39
4. Laptop and accessories	1,618	1	1,618	1,618	-
5. Communication	15	24	360	180	180
Total			**3,651**	**2,634**	**1,016**

SECTION 6: Additional Documentation

Short curricula vitae (resumes, biodata):

Team Leader - Dr. Ram C. Bhujel

Address: AARM, Asian Institute of Technology (AIT), PO Box 4, Khlong Luang, Pathumthani 12120, Thailand, Contact: bhujel@ait.ac.th

Academic qualification: M. Sc. and D. Tech. Sc. (Aquaculture) from AIT, Thailand, B. Sc. (Animal Science) from Institute of Agriculture and Animal Science (IAAS), Rampur, Chitwan, Nepal.

Teaching and student supervision: teaching post-graduate level since 2003, served/serving as thesis committee member of more than 10 post-grad students.

Research / Projects: has over 12 years experience in research and project implementation at Aquaculture and Aquatic Resources Management (AARM), AIT which include:

- Project Coordinator - Aqua-Internship project in Cambodia, Nepal and Vietnam, funded by EU (EURO 959,157), Sept 1, 2007 – Aug 31, 2010.
- Project Manager - Curriculum Development project in Cambodia, Nepal and Vietnam funded by EU (EUR 386,957, Sept 2005-Aug 2008).
- Team Leader - Women in Aquaculture in Nepal funded by German NGO (4 yrs, ~US$53,000)
- Manager - AARM tilapia Hatchery - carry out research and technology transfer to private and public sectors, e.g. a private farm (size 200 ha) in India.
- Other projects –AARM Joint Venture project (5 years, approx. ~US$100,000), Exotic Aquaculture Species: Problem and Prospect in SE Asia funded by SIDA (US$30,000) etc.

Publication:

- writing a book entitled “Statistics for Aquaculture” to be published by Blackwell Science
- co-authored a monograph entitled “Rainbow trout culture in the Himalayan Kingdom of Nepal: a success story” published by APAARI, FAO
- authored two edited conference proceedings or book chapters
- co-edited “International Mechanisms for the control and responsible use of alien species in aquaculture ecosystem” published by FAO
- published 9 referred journal articles, 30 popular articles in magazines newsletters, >20 papers presented in international conferences/workshops and >10 manuscripts under preparation,
- serve as a Guest Reviewer for Aquaculture Journal published by Elsevier Science

Professional memberships: World Aquaculture Society (WAS) including Asian Pacific Chapter, US Aquaculture Society (US-AS), Asian Fisheries Society (AFS) and Nepalese Fisheries Society (NEFIS)

Others: Manages AARM FoS homepage (www.aqua.ait.ac.th), promotes AARM/SERD/AIT as a whole, organizing various social activities and develops proposals to generate funds