Chapter 6

Conclusions and Recommendations

6.1   Brief summary of the real-world problem and scientific problem, as well as the purpose of the goals of the research

Especially after 1993, the situation of natural resources and economy of grassroots population declined precipitously. The distribution of knowledge and information in the general public also deteriorated. This research therefore sought to describe and explain the situation of non-timber forest resources, land and human resources in Myanmar today, especially in the fragile ecosystems where people are struggling for survival. For the purposes of this research, human resources here were judged to include awareness, attitude, knowledge and the social well-being of people in the society, since these can be marshalled to contribute to the reconstruction of the social and environmental well-being and local economy.

Most of the population in Myanmar today relies directly upon environment. There is a heightened tendency for the environment to be seen as common pool resources, creating a difficult situation for policy makers to control resource extraction. This situation has actually led to the tragedy of the commons. The property and ownership of land and resources is ambiguous. Therefore, people are trying to occupy more land to control and do not have incentive to take care of and manage land with no long term guarantee. The role of property rights and ownership has been examined in this study. Since the two target eco-marketing zones are remote

and development and transportation is out of reach, market analysis and utility could not be measured nominally.

The study is intended to identify the pressure points of environmental degradation where most people in Myanmar have to rely on natural resources from the environment directly. If there is a project for environmental conservation to enhance poverty alleviation, which factors are the most important to be corrected immediately? There should be policy recommendation that would help local government and civil societies to reconsider about the definition of development and sustainability, economic well-being and conservation and soft infrastructure parameters such as community empowerment, social reconstruction for the institutions, etc. and hard infrastructure (roads, telecommunication lines and market, etc.) construction which are the hardware of the development.

6.2　Brief reminder of the regions and villages selected for study and the methods of data collection and analysis

Table (6.1) summarises the variables and the direction of the impact across all nine hypotheses. This table helps to enrich our understanding of the many interactions and feedbacks among the variables shown in figure (5.1) in chapter 5. Each hypotheses occupies one column in the table and each variables occupies its own role what is immediately apparent is that the most universally significant determinant of improvements in the sustainable management of fragile Myanmar eco-marketing system is average attitude toward conservation, this variable is significant and positive in eight of the eleven equations shown. The negative and positive signs in the table shows the direction of the relation of the variable in each hypothesis. Small g means

the equation with samples from both area and small c and r means equations from Bagan and Kyaintali separately. What is exciting about this result is that attitude towards conservation are policies-operable; in other words, policy at the national level can enhance the attitude of the general population toward conserving the environment.

Only slightly less important are three other variables which also may be enhancing through appropriate development policies. These are other income or not, buy land and distance to the road. Other income or not improves attitude towards awareness of destruction and environmental behaviour but worst against environmental knowledge, attitude towards conservation, low behavioural foot-print and physical well-being. This does not mean that Myanmar economic development should eliminate other sources of income necessary for the structural transformation of the economy in the long run. Rather, is suggesting that people take non-farming jobs out of desperation because they are underpaid. Policy should therefore improve the productivity of labour and wages in rural non-farm jobs. Buying land generally has favourable impact on sustainability except in the case of environmental behaviour and environmental footprint. Government policies should therefore provide greater access to land but under strict guidelines as to its conservation. Distance to the road is significant in six equations and the closely related to the time to the road and is significant in the five other equations. What is remarkable is that distance to the road and time to the road often react in an opposite direction suggesting that huge differences in the quality of the road surface and or the type of vehicle used cut the correlation between miles and minutes. For example, increasing distance from the road decreases the average awareness of benefit of reforestation and the average attitude toward conservation. But time to the road increases the awareness of

environmental destruction. Two examples will be help to illustrate why this is so. There is the village called Taungpatlel in Rakhine State, which is surrounded by the mountain ranges and indeed a most remote area in the sample but it is found out that the villagers in Taungpatlel take shortes time to get to the road and awareness is highest. In central Myanmar, Taungphattan is further away from road comparing to Latpantal but have more access to road and communication since they have more vehicles and being close to the river and railway station. In deed, at least one type of communication variables was significant in all of nine hypotheses. Therefore, communication has a great impact on the entire soft system of human-nature interactions.

Also with five significance occurrences each, we find: average financial viability, which is generally negative correlated with sustainability; average attachment to the land, which is positively correlated with sustainability and the age of the household head, which is negatively associated with sustainability. The policy implication mean that landing agencies should put environmental conditionality on their loans, that greater land tenure security should be given to all the tillers of the soil and that a young farmer promotion campaign should be introduced. Economic well-being is also universally influential through out the system.

Table 6.1 Summary of hypotheses, regression analyses and descriptive statistics

CONCEPTS and indicators (number of occurrences)	*1a. Avg_aware_benefits_refor*	*1. Avg Aware destruction*	*2. Avg knowledge environment*	*3a. Avg attitude toward conservation*	*3b. Attitude toward ecotourism*	*4. Avg environm behaviour*	*5. Low Avg_behav_footprint*	*6. Nutritional status*	*7. Gross income per capita*	*8. Avg access inputs*	*9. Avg_community_manage*
ENVIRONMENTAL AWARENESS											
Average_aware_destruction			n.s.	n.s.	n.s.				g+ r+	g+ r+	c-r n.s.
Average_aware_benefits_refor			n.s.	g+ c+ r+					g-		
ENVIRONMENTAL KNOWLEDGE											
Average_know_env		g+ n.s n.s.		g+ r+						n.s.	g+ r+

Table 6.1 (Continued)

ENVIRONMENTAL ATTITUDES											
Average_attitude_conservation (8)	g+ r+	g+ c+	g+			g+c+	g+ c+ r+	n.s.	g+ r+	c- r n.s.	g+ c+ r+
Average_attitude_ecotour										n.s.	g+ c+ r+
ENVIRONMENTAL BEHAVIOUR Average_evn_behave (4)			n.s.					c+	c-	c+	c-
ENVIRONM. WELL-BEING Low average_behav_footprint		r+						g- r-	g n.s. c+ r-		c-

Table 6.1 (Continued)

PHYSICAL WELL-BEING										
Nu_cost_d		g+						r+		
Rice_cons_d									r+	
Nutritional_Status									g-	
Crop_diversity_next_year		r+						g+ c+ r		
Crop_diversity_last_year								n.s.	c-	
ECONOMIC WELL-BEING										
Gross_income	g-							g+ r+	r+	n.s.
Other_income		g- c-								
Other_income_or_not (6)		g+ c+	c-	g- c-	n.s.	c+ r+	r-	g-		
Gross_income_per_capita										
Net_income_over_labou_and_capital								g+		c+
Average_financial_viabil (5)	c- r-	g- c-			n.s.	g- c+	n.s.	g+ r-		g+ r+

Table 6.1 (Continued)

ECONOMIC EFFICIENCY										
Average_access_inputs	g+ c+	c n.s. r+						g+		
Benefit_costs_of_investment	g+							g+		
Percent_specialisation									r-	n.s.
SOCIAL WELL-BEING										
Attitude_community_management									n.s.	
Average_community_manage	n.s.	g- c- r+	g+ r+				n.s.	n.s.		
ACCESS TO RESOURCES										
Land_quality								r+		
soiltype			g- r-							
Self_cleared_land			g+							
Rent_land								g-	r-	r+

Table 6.1 (Continued)

Buy_land (6)	g+			g+	g- c+	c+	g- cn. s. r- g- cn. s.	c+		
Inherit_land				g+	n.s .	g-				
Enough_land					g- c-			c+		r-
Average_attch_land (5)	r+	g+ c+					r+	g+ r+		c+ r-
EMPLOYMENT										
Occupation head		r-								
Farmer			g+							
Random_job			g+							
Other_jobs			g+		c-					
COMMUNICATION										
Distance_road (6)	g-			g-	g+ c- r-	g+ c+	r-	g+ c+		n.s .
Time_road (5)		g+ c+ r n.s .	c-	n.s.	g n.s . c+		g-		g- r+	g+

Table 6.1 (Continued)

Distance_town		g- r-							c-	g+
Time_town										c+
Trips_month	g+ r+			g-					c+	
Tripcost										c+
Phonecalls								g+		
Phone bill						g+	c-		c+	
SOCIODEMOGRAPHICS										
Household size								g+ r+	c+	
Age head (5)	g-					g-	g-		g- g- g-	c+
Educastion_head					g+ r+			g+	r-	
Gender-head						g-			c+	
Yaesankwin	g+			g-				g-	g-	
Sisonekone	g+			g-	g-	g- r-		g-	g-	
Supotekone	g+			g-	g-			g-	g-	
Doetan	g+			g-	g-			g-	g-	
Latpantal	g+			g-		g+			g-	
Taungphattan	g+				n.s.				g-	
Central Burma							g-			

6.3   Results of econometric hypothesis testing

Environmental awareness hasa   positive impact on attitudes towards the environment, gross income per capita, average access to inputs and average community management in central Myanmar. It has a negative impact on gross income per capita of people in central Myanmar and average community management in Rakhine State.

Awareness of the benefits of reforestation is high where there is high community management and awareness of degradation that is derived from the level of intensity that villagers are facing problems concerning to environmental degradation, is high in low level of community management. The average financial viability gives negative impact on awareness of the environment.

6.4   Policy recommendation from the system equations

Financial viability has a negative impact and economic efficiency a positive impact on environmental awareness. This implies that exposure to more efficient production and marketing does not disturb understanding about the environment in these two particular eco-market zones; only the information is asymmetric. Average community management, our proximate indicator for social well-being, makes people aware of the benefits of reforestation and decreases the impacts of environmental destruction. If we want to solve the problem of low environmental awareness, we should promote participation by the local community in environmental issues and economic decisions.

We need to strengthen people's faith in community management. The resulting social well-being, enhanced by communication and discussions among the

villages, will generate and spread more knowledge. Projects should also provide all segments of the population with true and pertinent information about their environment.

The problem here is that most people in central Myanmar think ecotourism and conservation are not their own job, but that of some vaguely defined higher social class. The populace does not have much contact with conservation projects and participation is largely token. In Rakhine State, conservation is willingly undertaken by local people but few have heard of our grasped the concept of ecotourism.

If we want to establish environmental conservation and community based ecotourism, we should locate an area there is highly impacted by degradation, far away from the road, but whence villagers have the ability to commute relatively more easily than from other villages. The distribution of information is very important. Further study is needed to determine how the system of attitudes toward conservation and attitude toward ecotourism will work in the local community.

Building up good attitudes toward the environment and the economic well-being of the people can be achieved by giving more off farm income in the short run. This would promote environmentally sustainable behavior in the medium to long runs.

Giving people the sense of ownership to land and off farm income sources reduces dependency on the environment. This in turn will lead to more sustainable development of the rural economy.

Since crop diversity is significant, increasing the purchasing power of all kinds of food products from livestock, fishery and industrial, will allow people to have more

diversity of nutrition. One strategy to do this would be to incite farmers to choose more diversity in crops, rather than focusing on only one cash crop.

We need to give more information about land use and sustainable agriculture so that hat people can improve the utility of their land and feel more security in their ownership of and or long term access to land.

There is a conflict between economic efficiency on the one hand, and attitudes towards conservation and behavioral foot print on the other. People in the study regions today seem to think that they should not conserve the environment to have more efficiency in economy. The environmental movement should highlight ways to access land and forest resources properly, i.e. by maintaining natural-resource, economic, and social sustainability. Conservation should not be given such weight that it prohibits the enjoyment of all other sorts of utility.

There is certainly a leakage of information. The fact that average financial viability and percent specialization have positive impacts on social well-being in Rakhine State points to the immediate need of the people to solve their economic problems through group action. In central Myanmar, net income over capital and labour has a positive impact that the people's faith in governance. Agricultural extension processes should therefore be implemented with great care to promote community cohesion and group action.

6.5   Limits of the research Conclusions

There were nine hypotheses tested, out of which four were accepted. Hypotheses about environmental awareness, environmental knowledge, nutritional status (Physical Well-being) and average community management (Social Well-

being) were been accepted. The other five hypotheses which tested about environmental attitude, environmental behaviour, environmental well-being (less environmental foot-print), economic well-being (gross income per capita) and economic efficiency (average access to inputs) were being rejected. All the hypotheses variables are interlink to each other and have impact on each other as an intrinsic web having all together fifty arrows going back and fourth among each other. Communication, which comprises telecommunication, distance to road, distance to town, time to town, time taken to road and trips per months, etc. has impact on all those nine hypotheses variables. This fact alone justifies the selection of two regions with different market access.

6.6   Suggestions for future research

There can be more variables that contribute welfare in the community. More attention should be given to those variables where there is no significant relationship among each other even though there is apparent inter-relation happen in the correlation matrix.

If there is a time series study for these data collected on awareness, attitude and behavioural changed in each different period of time in the project, it will be more scientific to tell how economic and social development can bring about by the environmental management or governance.

The study of economic development strategies should be tested to know more in depth into social behaviour, awareness and environmental dependency before making a cost-benefit analysis of the natural ecosystem services. A new study of multi disciplinary approach should be done in the study of ecology, economics and

environmental economics.   Not only for extraction, but also for a conservation process, there should be study of underlying causes for deforestation and economic rent of deforestation too.