

## Chapter 2

### LITERATURE REVIEWS

The soil fertility is the most important factor which is strong influence on the yield plants and the economic situation of farmer households. Changes in land cover in turn can have various consequences on economic growth, the level and distribution of income, and on natural resources such as biodiversity, ecosystems, water, and soils (Müller and Zeller, 2002). The natural soil properties are encompass of physical, chemical, biological properties and are determined by many factors, such as climate, topography, rocks, hydraulics, organisms and time (Jenny, 1941). Degradation of natural resources which is a global problem we are facing difficult challenge to find a suitable way to deal with. In Vietnam, the mountainous upland area is the ecological zone where resource degradation is most serious. The uplands consist of hills, highlands and plateaus, occupying 24.4 million hectares (74%) of the country's total area (Leisz et al., 2005). The land cultivation is more and more using on steep slope land as the increase of population in northern mountainous regions in Vietnam. Yen Chau district, agricultural land use per capita reduced from 0.5 ha per capita in 1980 to 0.2 ha per capita in 1998 (Wezel, 2002). Farmers' changes of farm practices and cropping types results in change of land cover and vegetation type. A non-permanent vegetation cover will lead to land degradation through increased soil erosion. Reduced fallow period and permanent hybrid crop in the upland fields of Yen Chau district are leading soil erosion, leaching, and depletion (Clemens, et al., 2010). Dramatic levels of erosion have a negative effect on household incomes and also

compromise the ability of future generations to earn an income from agriculture (Quang et al., 2010).

Land suitability evaluation, the FAO/ITC-Ghent evaluation method is a semi-quantitative approach for bio-physical land evaluation (Sys et al., 1991). It involves the comparison of crop requirements with the natural conditions of land. The crop requirements are given by Sys et al. (1993) and are composed of four ecological requirement groups for climate: The suitability of a given piece of land is its natural ability to support a specific purpose. According to the FAO (1976), these qualities derive from the "land characteristics", such as slope angle and length, rainfall and soil texture which are measurable or estimable, it is advantageous to use these later values to study the suitability. Thus, the land characteristics parameters were used to workout land suitability for crops. The land suitability classification consists of assessing and grouping the land types in orders and classes according to their aptitude.

The order defines the suitability and is expressed by:

- S (suitable), that characterizes a land were sustainable use giving good benefits is expected;
- N (not suitable) indicating a land which qualities do not allow the considered type of use, or are not enough for sustainable outcomes.