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ข้อความแห่งการริเริ่ม

1. วิทยานิพนธ์นี้ได้รับเริ่มการศึกษามาจากกลุ่มน้ำฝางเป็นพื้นที่ที่เหมาะสมสำหรับการปลูกส้ม และให้ผลผลิตคุณภาพดี รสชาติหวานจึงเป็นที่ต้องการของตลาด ส่งผลให้เกษตรกรขยายพื้นที่เพราะปลูกเพิ่มขึ้นอย่างต่อเนื่องระหว่างปี ค .ศ.2002 – 2011 พื้นที่เพาะปลูกที่เพิ่มขึ้นทำให้มีการใช้สารเคมีเพิ่มสูงตามไปด้วย การใช้สารเคมีเกินปริมาณ มากและเกินความจำเป็นส่งผลกระทบต่อสุขภาพประชาชนและสิ่งแวดล้อมในกลุ่มน้ำฝาง คณะรัฐมนตรีจึงได้ประกาศให้กลุ่มน้ำฝางเป็นพื้นที่ปกป้องสิ่งแวดล้อมเป็นระยะเวลา 5 ปี ช่วงปี ค .ศ.2003 – 2008 นอกจากนี้พื้นที่ปลูกส้มส่วนใหญ่ปลูกใน พื้นที่ลาดชันและเป็นแหล่งต้นน้ำ ทำให้เกิดการชะล้างพังทลายของดินและดินขาดความอุดมสมบูรณ์ ขณะเดียวกันการใช้สารเคมีและปุ๋ยเกินความจำเป็นทำให้เกิดการตกค้างในดินและปะปนสู่แหล่งน้ำ สถานการณ์ดังกล่าวนี้ทำให้ดินเป็นกรดและความไม่สมดุลของการแลกเปลี่ยนธาตุอาหารในดิน ในอีกด้านหนึ่งการใช้สารเคมีที่เพิ่มขึ้นเพื่อหยุดยั้ง โรคและแมลง ส่งผลถึงผลผลิตและคุณภาพของส้มลดลง ราคาผลผลิต ก็ตกต่ำ ขณะที่ต้นทุนการผลิตที่สูงขึ้น เกษตรกรจึงได้รับผลตอบแทนลดลง นี่จึงเป็นสาเหตุของการลดลงของพื้นที่ปลูกส้มในกลุ่มน้ำฝาง ตั้งแต่ปี ค .ศ.2012 จนถึงปัจจุบัน
2. การศึกษานี้ใช้วิธีการศึกษาเชิงระบบที่จะชี้ให้เห็นถึงผลกระทบของการใช้ทรัพยากรในระบบที่จะมีผลกระทบซึ่งกันและกัน ผลกระทบที่เกิดขึ้นในระดับฟาร์มย่อมส่งผลกระทบต่อระดับลุ่มน้ำ เป็นต้น ดังนั้นการศึกษานี้แบ่งการศึกษาเป็นระดับฟาร์มและระดับลุ่มน้ำ ในระดับฟาร์มแบ่งออกเป็น 4 ประเภท คือ ฟาร์มขนาดเล็กใช้สารเคมี ฟาร์มขนาดเล็กใช้สารเคมีร่วมกับชีวภาพ ฟาร์มขนาดใหญ่ใช้สารเคมี ฟาร์มขนาดใหญ่ใช้สารเคมีร่วมกับชีวภาพ วิเคราะห์ข้อมูลแบบหลายวัตถุประสงค์ ใช้การศึกษาแบบมีส่วนร่วมของผู้มีส่วนได้ส่วนเสียทั้งในระดับฟาร์มและลุ่มน้ำเป็นผู้ให้คะแนนความสำคัญของวัตถุประสงค์ที่ใช้ในการวิเคราะห์ ใน การวิเคราะห์แผนการใช้ที่ดินที่เหมาะสมระดับลุ่มน้ำและแผนการระดับฟาร์มเมื่อคำนวณให้เต็มพื้นที่ลุ่มน้ำ ถ้าผลการศึกษามีความแตกต่างของแผนการใช้ที่ดินเหมาะสมผู้มีส่วนได้เสียในระดับฟาร์มและลุ่มน้ำที่ควรจะได้มาพูดคุยกัน เพื่อหาทางออกร่วมกันในการวางแผนการใช้ที่ดินที่ยั่งยืนในลุ่มน้ำฝาง

3. การวิเคราะห์ความอ่อนไหวในสถานการณ์ต่างๆ ของระดับฟาร์มและลุ่มน้ำ เพื่อผู้มีส่วนได้ส่วนเสียในแต่ละระดับทราบถึงแนวโน้มของการเปลี่ยนแปลงในสถานการณ์ต่างๆ ที่จะเป็ทางเลือกในการใช้ทรัพยากรที่มีอยู่อย่างจำกัดให้เกิดประโยชน์สูงสุดอีกด้วย
4. ด้วยการใช้ที่ดินมักจะมีขีดแย้งกันในวัตถุประสงค์ในด้านต่างๆ ดังนั้นในการศึกษานี้จึงวิเคราะห์การทดแทนกัน (Trade-off) ในระดับฟาร์มและลุ่มน้ำ การวิเคราะห์การทดแทนกันเป็นการหาความสัมพันธ์ระหว่างวัตถุประสงค์ ซึ่งการวิเคราะห์ดังกล่าว จะช่วยทำให้เข้าใจถึงควรจะมีการปรับค่าเป้าหมายแต่ละวัตถุประสงค์ ผลที่ได้จากการวิเคราะห์สามารถใช้เป็นแนวทางในการจัดทำแผนการพัฒนาการใช้ที่ดินอย่างยั่งยืนในลุ่มน้ำฝางต่อไป

STATEMENT OF ORIGINALITY

1. This thesis with the investigation of the Fang watershed where it is suitable for citrus growing with good yield quality needed by markets. This resulted in continual expansion of citrus growing area during 2002 – 2011. However, there was an increase in the chemical use which had a negative effect on health, citrus growers and the environment in the Fang watershed. Therefore, the cabinet claimed the Fang watershed as a protection area for 5 years (2003 – 2008). In general, citrus orchards in the Fang watershed are located on sloping areas which are prone to soil erosion and soil degradation. Meanwhile, the residues from high chemical and fertilizer usage left in the soil were leached and contaminated the stream water. Consequently, this affects soil acidity and soil nutrient imbalance. In addition, there was also an increase in outbreaks of diseases and pests in this area. These have resulted in a decrease in the citrus yield as well as product quality, together with high input costs, low yields, low prices and low net returns. These have caused a decrease in the citrus plantation area in the Fang watershed since 2012 up to the present.
2. This study employed a systems study indicating effects of resource utilization on the citrus farms in the Fang watershed. The effects on the farm and watershed levels could be classified into 4 farm types: 1) the small farm using chemicals 2) the small farm using chemicals and bioextract 3) the large farm using chemical and 4) the large farm using chemical and bioextract. Obtained data were analyzed with the multiple goals. This was in terms of stakeholder participation at the farm and watershed levels. Stakeholders were given the weight goals according to their importance. If the analysis showed an optimal land use management based on the farm-level results different from the optimal land use at the watershed levels, it could be used as a basis for discussion between farmers and watershed officials so that some changes to land use can be achieved to attain sustainability in the Fang watershed.

3. There were sensitivity analyses of various situations at the farm and watershed levels in order to point out the trends of changes for different stakeholder. This could lead to alternative for the best ways to utilize limited resources.
4. Since land use usually had opposing objective, therefore, this study needed to analyze trade-off at the farm and watershed levels. A trade-off analysis is used to find the relationships between objectives. Trade-off relationships will help to understand how to adjust the target value of each objective in order to find the optimal outcome. The results of such analysis can be used for sustainable land use plan in the Fang watershed.