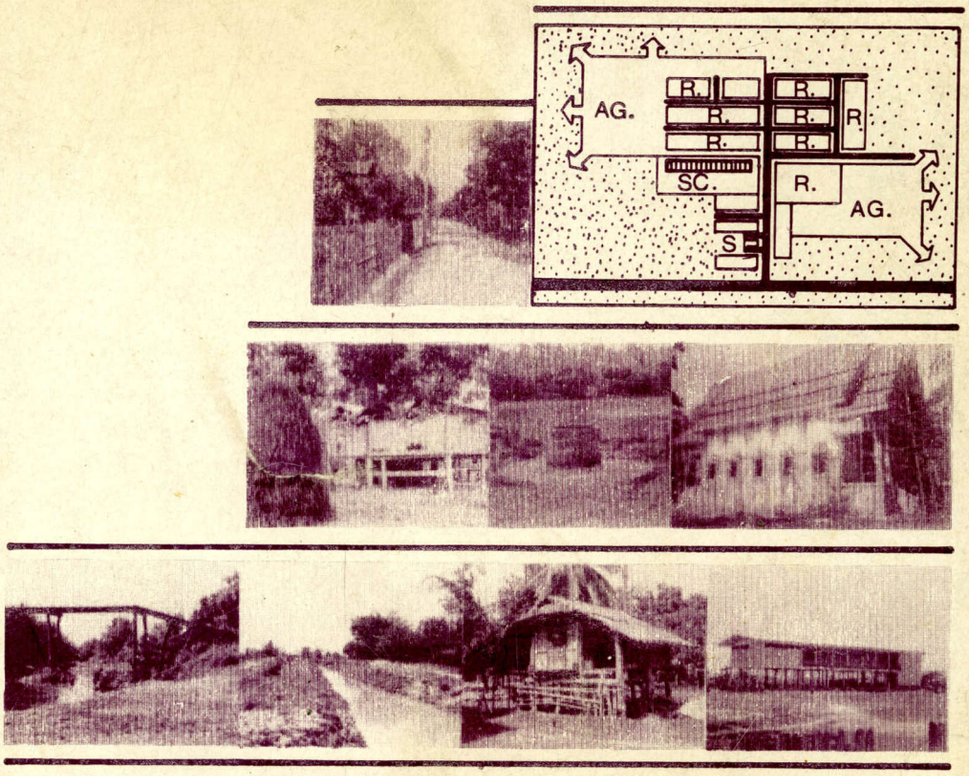

FINAL REPORT ON

PHYSICAL DEVELOPMENT OF RURAL SETTLEMENTS IN THAILAND

— AN OPPORTUNITY FRAMEWORK

SUBMITTED TO : NATIONAL HOUSING AUTHORITY

BUILDING RESEARCH DIVISION

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บทสรุปสำหรับผู้บริหาร

ที่อยู่อาศัยเป็นปัจจัยพื้นฐานที่สำคัญอันหนึ่งในการดำรงชีพของมนุษย์ ถึงแม้ที่อยู่อาศัยจะไม่มีความสำคัญเป็นอันดับหนึ่งก็ตาม แต่ก็เป็นปัจจัยที่มนุษย์จะขาดไม่ได้

ปัจจุบันสภาพการอยู่อาศัยของชาวชนบททั้งประเทศมีความแตกต่างจากสภาพการอยู่อาศัยของชาวเมืองอย่างมาก สถานะการณ์เช่นนี้มักจะเกิดขึ้นกับประเทศที่ด้อยพัฒนาหรือประเทศที่กำลังพัฒนาเป็นส่วนใหญ่ สาเหตุที่เป็นเช่นนี้ก็เพราะแนวทางการพัฒนาประเทศส่วนใหญ่มักจะมุ่งพัฒนาเพื่อก่อให้เกิดการเจริญเติบโตทางเศรษฐกิจของส่วนรวมเป็นหลัก การพัฒนาทางกายภาพจึงทำไปเฉพาะส่วนที่เป็นโครงสร้างพื้นฐานเท่านั้น การพัฒนาทางด้านที่อยู่อาศัยจึงมักมิได้รับความสนใจจากรัฐบาลอย่างจริงจัง สำหรับประเทศไทยการพัฒนาด้านที่อยู่อาศัยในชนบทเริ่มจะมีอุปสรรคมากขึ้น ทั้งนี้เพราะไม้ซึ่งเคยเป็นวัสดุหลักในการก่อสร้างที่อยู่อาศัยเริ่มขาดแคลน และวัสดุก่อสร้างอื่น ๆ ก็มีราคาแพงขึ้นมาก ชาวชนบทไทยด้อยในด้านทุนทรัพย์อยู่แล้วจะประสบปัญหามากในด้านที่อยู่อาศัย จึงเป็นที่แน่นอนว่ามาตรฐานการอยู่อาศัยในชนบทของประเทศจะลดต่ำลงเรื่อย ๆ ทำให้ความแตกต่างระหว่างชนบทกับเมืองปรากฏให้เห็นเด่นชัดยิ่งขึ้นอันเป็นสาเหตุของการย้ายถิ่นฐานของประชากรจากชนบทเข้าสู่เมืองซึ่งไม่เป็นผลดีต่อเสถียรภาพทางความมั่นคงของประเทศ

การเคหะแห่งชาติ (กคช.) ได้เล็งเห็นถึงความสำคัญของปัญหาดังกล่าวจึงได้ร่วมมือกับสถาบันวิจัยวิทยาศาสตร์และเทคโนโลยีแห่งประเทศไทย (วท.) ทำการศึกษาเพื่อกำหนดแนวนโยบายและแนวทางในการพัฒนาที่อยู่อาศัยในชนบท โดยมุ่งหวังว่าจะก่อให้เกิดผลดี ๓ ประการคือ

(๑) แก้ปัญหาความแตกต่างในด้านความเป็นอยู่ระหว่างเมืองกับชนบท มิให้เพิ่มขึ้นมากจนถึงระดับที่จะก่อให้เกิดผลกระทบต่อความมั่นคงของประเทศ

(๒) การพัฒนาการอยู่อาศัยของชาวชนบท หากมีรูปแบบและทิศทางการดำเนินงานที่เหมาะสมจะเป็นเครื่องมือในการกระตุ้นความเจริญเติบโตทางเศรษฐกิจของชนบท ทั้งนี้เพราะการก่อสร้างจะใช้แรงงานมาก การว่าจ้างในท้องถิ่นจะช่วยลดปัญหาการเคลื่อนย้ายประชาชนจากชนบทเข้าสู่เมือง และจะเกิดกระแสเงินหมุนเวียนในท้องถิ่นชนบทได้มากขึ้น

(๓) การส่งเสริมให้ใช้วัสดุอื่นแทนไม้จะช่วยแก้ปัญหาการทำลายป่าและช่วยกระตุ้นให้เกิดการลงทุนในอุตสาหกรรมผลิตวัสดุก่อสร้างในชนบท รวมทั้งส่งผลให้การนำทรัพยากรอื่น ๆ มาใช้ให้เกิดประโยชน์ยิ่งขึ้น

(๑) <u>แนวทางการศึกษา</u>

การศึกษาได้ยึดแนวทางตามหลักการวางแผน ๓ ประการดังนี้.-

(๑.๑) ในการพัฒนาที่อยู่อาศัย ควรจะพัฒนาอะไรบ้าง?

เพื่อบรรลุถึงคำตอบในข้อนี้ คณะทำงานได้ทำการสำรวจและศึกษาข้อมูลทุติยภูมิในระดับกว้างทางเศรษฐ-สังคม จากหน่วยงานต่าง ๆ และจากการสำรวจข้อมูลภาคสนามในหมู่บ้านจำนวน ๕๑ หมู่บ้านที่เป็นตัวแทนของภาคเหนือ, ภาคอีสาน, และภาคใต้ นำมาวิเคราะห์เพื่อประเมินความต้องการและอุปสงค์ด้านที่อยู่อาศัยและความต้องการด้านชุมชนพร้อมทั้งคาดคะเนความต้องการในอนาคต ๕ ปี ข้างหน้าด้วย

(๑.๒) จากขีดความสามารถและทรัพยากรของประเทศที่มีอยู่จะสามารถพัฒนาอะไรได้บ้าง?

สำหรับคำตอบข้อที่ ๒ นี้ ได้ทำการศึกษาข้อจำกัดทางเศรษฐ-สังคม เทคนิค และองค์กรการดำเนินงานที่มีต่อการพัฒนาด้านกายภาพของชุมชนในชนบท ทั้งยังได้ทำการศึกษาวิเคราะห์วัสดุก่อสร้างรูปแบบใหม่สำหรับทดแทนไม้ จากข้อจำกัดต่าง ๆ ที่ได้ศึกษาและศักยภาพการใช้งานของวัสดุใหม่เหล่านี้ด้วย จึงได้กำหนดแนวทางการพัฒนาไว้หลายรูปแบบ

(๑.๓) ในส่วนที่สามารถทำการพัฒนาได้นั้น ควรจะทำอย่างไร?

คำตอบในข้อสุดท้ายนี้ ได้กำหนดกลยุทธในการพัฒนา ซึ่งได้กล่าวรวมถึงการจัดองค์กรและแนวทางการดำเนินงานในการพัฒนาระดับชุมชนและระดับประเทศ

(๒) <u>ผลของการศึกษาและวิเคราะห์</u>

(๒.๑) ผลการประเมินความต้องการและอุปสงค์

เพื่อให้ความเข้าใจของผู้อ่านและคณะทำงานตรงกัน จึงขออธิบายความหมายของคำว่า "ความต้องการ" และ "อุปสงค์" ดังนี้

"ความต้องการ" หมายถึงความต้องการที่เกิดขึ้น แต่ยังขาดปัจจัยทางการเงิน แต่เมื่อสามารถหาปัจจัยทางการเงินมาตอบสนองความต้องการ ประกอบกับการตัดสินใจที่จะดำเนินการ เพื่อให้บรรลุถึงจุดประสงค์ของความต้องการนั้น จึงเรียกว่าเป็น "อุปสงค์"

ผลจากการประเมินความต้องการและอุปสงค์สรุปได้ดังนี้.-

ความต้องการของการพัฒนาทางกายภาพในการตั้งถิ่นฐานมนุษย์ในรายงานนี้แบ่งออกเป็น ๒ กลุ่มใหญ่ ๆ คือ

(๒.๑.๑) ความต้องการและอุปสงค์ส่วนบุคคล

เป็นความต้องการเฉพาะที่อยู่อาศัยซึ่งรวมทั้งองค์ประกอบต่าง ๆ ภายในบริเวณบ้านและตัวบ้าน หรือเป็นความต้องการเฉพาะบ้านพักอาศัย

ผลการสำรวจและวิเคราะห์สภาพทางกายภาพของบ้าน ซึ่งรวมทั้งส่วนประกอบต่าง ๆ ภายในบริเวณบ้าน การใช้วัสดุในส่วนประกอบต่าง ๆ ของบ้าน ทัศนคติของชาวบ้านที่มีต่อที่อยู่อาศัยและปัญหา และความต้องการด้านที่อยู่อาศัยของเจ้าของบ้าน สรุปได้ดังนี้.-

- สภาพกายภาพของชาวชนบท

บ้านชนบทส่วนใหญ่มีอยู่ประมาณ ๖ รูปแบบ รูปแบบที่มีมากที่สุด คือแบบทรงจั่วธรรมดา สำหรับแปลนบ้านส่วนใหญ่เป็นรูปสี่เหลี่ยมจตุรัสหรือผืนผ้า มีและไม่มีชาน ตัวบ้านนิยมยกพื้นสูงจากพื้นดินประมาณ ๑.๕๐ - ๒.๕๐ เมตร มีเฉพาะภาคใต้ที่นิยมใช้พื้นติดดิน บ้านชนบทส่วนใหญ่แบ่งพื้นที่ใช้สอยเพียง ๔ ส่วน คือ พื้นที่สำหรับนอน พื้นที่เอนกประสงค์ พื้นที่ครัว พื้นที่ชาน และพื้นที่สำหรับห้องน้ำ จากผลสำรวจพบว่ามีจำนวนบ้านประมาณครึ่งหนึ่งที่ใช้พื้นที่ห้องนอนร่วมกับพื้นที่เอนกประสงค์ และมีบ้านจำนวนไม่น้อยที่ไม่มีห้องน้ำ

วัสดุที่ใช้ก่อสร้างบ้านในส่วนที่เป็นโครงสร้างส่วนใหญ่ใช้ไม้ จะมีใช้คอนกรีตบ้างเฉพาะส่วนที่เป็นฐานรากและเสาตอม่อ ไม้ไผ่มีใช้อยู่มากเช่นกันในส่วนที่เป็นฝา โครงหลังคาและพื้น โดยเฉพาะในภาคเหนือและภาคใต้ สำหรับหลังคานิยมใช้สังกะสีกันเป็นส่วนใหญ่รองลงมาคือจากหรือหญ้าคาและกระเบื้องลอนคู่ก็ได้รับความนิยมพอประมาณโดยเฉพาะในภาคใต้

ผลสำรวจสภาพบ้านในชนบทพบว่าประมาณครึ่งหนึ่งของบ้านในชนบทมีอายุไม่เกิน ๕ ปี และส่วนใหญ่มีอายุไม่เกิน ๑๕ ปี แสดงว่ามีอุปสงค์ของบ้านใหม่ในระยะ ๕ ปีนี้สูงมากอาจเป็นผลจากการพัฒนาประเทศที่ผ่านมา และผลจากการขายแรงงานในเมืองหรือในต่างประเทศของชาวชนบท บ้านในภาคเหนือและภาคอีสานมีอายุโดยเฉลี่ยน้อยกว่าบ้านในภาคใต้ ซึ่งสอดคล้องกับผลสำรวจสภาพบ้านที่ระบุว่าประมาณ ๖๐% ของบ้านในภาคเหนือและภาคอีสานอยู่ในสภาพปานกลาง ขณะที่มีเพียงประมาณ ๔๐% ของบ้านในภาคใต้อยู่ในสภาพปานกลาง สำหรับบ้านที่มีสภาพทรุดโทรมพบว่าภาคเหนือและภาคอีสานมีเพียง ๑๐% ส่วนภาคใต้มีถึง ๒๓%

ผลสำรวจสภาพบ้านถึงแม้จะระบุว่าบ้านส่วนใหญ่มีสภาพปานกลาง มิได้หมายความว่าปัญหาและความต้องการด้านที่อยู่อาศัย จะไม่มี ทั้งนี้เพราะจากการสำรวจพบว่าปัญหาและความต้องการด้านนี้ของชาวชนบทมีอยู่เป็นจำนวนมาก ดังจะได้กล่าวในหัวข้อต่อไปนี้

- ปัญหาและความต้องการ

ผลสำรวจทัศนคติของเจ้าของบ้านที่มีต่อบ้านที่อยู่อาศัย พบว่ามีเจ้าของบ้านจำนวนมาก (ประมาณ ๔๑ - ๖๐%) ที่แสดงออกถึงความไม่พอใจในสภาพที่อยู่อาศัย อันมีสาเหตุที่สำคัญคือ เนื้อที่ใช้สอยไม่เพียงพอและสภาพทรุดโทรม

สำหรับความต้องการในการปรับปรุงที่อยู่อาศัยนั้นพบว่า ความต้องการที่จะสร้างบ้านใหม่มีมากเท่า ๆ กับความต้องการที่จะต่อเติมบ้านคือประมาณ ๒๐% ส่วนที่เหลือก็เป็นความต้องการในการเปลี่ยนวัสดุของส่วนประกอบ เช่น ฝ้า ฝาและหลังคา นอกจากนี้ก็เป็นความต้องการซ่อมแซมและปรับปรุงบ้าน

ผลสำรวจและวิเคราะห์ระบุว่า ปัญหาและความต้องการที่กล่าวมาแล้วข้างต้นไม่แตกต่างกันมากนักในระหว่างชาวชนบทที่มีรายได้แตกต่างกัน

- ราคาค่าก่อสร้าง

ผลจากการสำรวจไม่สามารถนำมาประเมินราคาค่าก่อสร้างที่แท้จริงได้ ทั้งนี้เพราะการก่อสร้างบ้านในชนบทในสมัยก่อนใช้วัสดุก่อสร้างที่หามาได้เองเป็นส่วนใหญ่ ด้านแรงงานก็อาศัยการร่วมกันระหว่างชาวบ้านในการก่อสร้าง

จากผลการสำรวจและวิเคราะห์นำมาประเมินความต้องการและอุปสงค์ได้ดังนี้.-

(ก) ความต้องการบ้านใหม่ ความต้องการรูปแบบนี้เกิดขึ้นเนื่องจากมีการแยกครอบครัวไปตั้งครอบครัวใหม่ ความต้องการส่วนนี้ประเมินจากค่าเฉลี่ยของสถิติอัตราเพิ่มของจำนวนบ้านในช่วง ๑๓ ปีที่ผ่านมา ได้ค่าเฉลี่ยอัตราเพิ่มของจำนวนบ้านต่อปีเป็น ๒.๗๖%, ๒.๔๔% และ ๒.๔๑% สำหรับภาคเหนือ ภาคอีสาน และภาคใต้ตามลำดับ ได้ใช้ตัวเลขดังกล่าวประเมินหาความต้องการในอนาคตไว้ในตารางที่ (๑) เนื่องจากความต้องการส่วนนี้เป็นความต้องการที่มีสถิติว่าได้รับการตอบสนองให้เกิดเป็นอุปสงค์ได้ ดำความต้องการในตารางที่ ๑ นั้นก็คืออุปสงค์นั่นเอง

(ข) ความต้องการบ้านใหม่แทนบ้านเก่า ความต้องการรูปแบบนี้ส่วนใหญ่เกิดขึ้นเนื่องจากบ้านเก่ามีสภาพทรุดโทรม ซึ่งประเมินได้จากเปอร์เซนต์ของเจ้าของบ้านที่จะทำการสร้างบ้านใหม่แทนบ้านเก่าตามที่ได้กล่าวมาแล้ว แต่เนื่องจากจำนวนบ้านใหม่ที่คิดจากเปอร์เซนต์ดังกล่าว ไม่ใช่จำนวนที่เป็นอุปสงค์ภายใน ๑ ปี ข้างหน้า เพราะความต้องการส่วนนี้จะค่อย ๆ เปลี่ยนเป็นอุปสงค์ตามอำนาจการซื้อที่เจ้าของบ้านสามารถสร้างขึ้นมาได้และตามสภาพบ้านที่ทรุดโทรมลงเรื่อย ๆ จนถึงขีดที่ต้องการเปลี่ยนแปลง อุปสงค์ส่วนนี้จึงประเมินจากเปอร์เซนต์ความต้องการบ้านใหม่ดังกล่าว ภายในช่วงเวลาระหว่างค่าเฉลี่ยของอายุบ้าน อายุใช้งานของบ้าน (ในที่นี้คิดประมาณ ๒๐ ปี) ผลการประเมินได้อุปสงค์ส่วนนี้ประมาณ ๒๐๐,๐๐๐ หลังต่อปี ภายในช่วง ๕ ปีข้างหน้า

(๒.๑.๒) ความต้องการของชุมชน

ความต้องการของชุมชนนี้มีข้อแตกต่างจากความต้องการส่วนบุคคลที่สำคัญอยู่ประการหนึ่งคือ ตามปกติความต้องการส่วนนี้ในภาคเมือง รัฐเป็นผู้จัดหามาเพื่อตอบสนองความต้องการ โดยได้รับผลตอบสนองจากประชาชนในรูปภาษี จึงจะถือว่าการตอบสนองส่วนนี้ในภาคชนบทก็จะเป็นหน้าที่ของรัฐเช่นกัน ปัญหาที่สำคัญจึงมีอยู่ที่ว่าจะจัดลำดับความต้องการเพื่อตอบสนองอย่างไร? จึงจะมีประสิทธิผลสูงสุด เป็นที่ยอมรับของชาวชนบทและจะมีวิธีการใดที่จะทำให้ประชาชนในหมู่บ้านช่วยกันรักษาสิ่งอำนวยความสะดวกต่าง ๆ เหล่านั้นให้อยู่ในสภาพที่ใช้งานได้ดีต่อไป

ตารางที่ (๑) ประมาณการความต้องการบ้านใหม่ของกลุ่ม

ปี	ภาคเหนือ		ภาคอีสาน		ภาคใต้	
	จำนวนครัวเรือน	อุปสงค์	จำนวนครัวเรือน	อุปสงค์	จำนวนครัวเรือน	อุปสงค์
๒๕๒๒	๑,๕๔๖,๓๕๓	-	๒,๑๙๙,๑๘๑	-	๗๔๙,๗๘๓	-
๒๕๒๓	๑,๕๘๙,๑๓๒	๔๒,๖๗๙	๒,๒๕๓,๒๘๑	๕๔,๑๐๑	๗๖๗,๘๖๓	๑๘,๑๗๑
๒๕๒๔	๑,๖๓๒,๘๘๙	๔๓,๘๕๗	๒,๓๑๘,๗๑๒	๕๕,๔๓๑	๗๘๖,๓๖๙	๑๘,๕๑๖
๒๕๒๕	๑,๖๗๗,๙๕๗	๔๕,๑๖๘	๒,๓๖๕,๕๑๖	๕๖,๗๙๔	๘๐๕,๓๒๑	๑๘,๙๕๒
๒๕๒๖	๑,๗๒๔,๒๖๙	๔๖,๓๑๒	๒,๔๒๓,๖๙๗	๕๘,๑๙๑	๘๒๑,๗๒๙	๑๙,๕๑๘
๒๕๒๗	๑,๗๗๑,๘๕๙	๔๗,๕๔๑	๒,๔๘๓,๗๒๑	๕๙,๖๒๓	๘๔๔,๖๑๕	๑๙,๘๗๖
๒๕๒๘	๑,๘๒๑,๗๖๒	๔๘,๙๑๓	๒,๕๔๕,๔๑๑	๖๑,๑๙๑	๘๖๕,๙๖๑	๒๑,๓๕๕
๒๕๒๙	๑,๘๗๑,๐๑๕	๕๑,๒๕๓	๒,๖๐๗,๐๑๓	๖๒,๕๙๓	๘๘๕,๘๑๖	๒๑,๘๕๖
๒๕๓๐	๑,๙๒๒,๖๕๕	๕๑,๖๕๑	๒,๖๗๑,๑๓๕	๖๕,๑๓๒	๙๐๗,๑๕๔	๒๑,๓๔๘
๒๕๓๑	๑,๙๗๕,๗๒๐	๕๓,๐๖๕	๒,๗๓๖,๘๔๕	๖๕,๗๑๑	๙๒๙,๐๑๖	๒๒,๐๐๐
๒๕๓๒	๒,๐๓๑,๒๕๑	๕๔,๕๓๑	๒,๘๐๔,๑๗๑	๖๗,๓๒๖	๙๕๑,๙๐๕	๒๒,๓๘๙
๒๕๓๓	๒,๐๘๖,๒๘๕	๕๖,๐๓๕	๒,๘๗๓,๑๕๔	๖๘,๙๘๓	๙๗๔,๓๓๔	๒๒,๙๒๙

แนวความคิดดังกล่าวเป็นผลจากการสำรวจและวิเคราะห์ซึ่งพอจะสรุปได้ดังนี้.-

- สภาพพื้นฐานทั่วไปของชุมชน

ผลสำรวจชุมชนจำนวน ๕๑ หมู่บ้านใน ๓ ภาคพบว่า ชุมชนในชนบทส่วนใหญ่ตั้งบ้านเรือนรวมกันในรูปของหมู่บ้านกลุ่ม (Cluster Settlement) รองลงมาคือหมู่บ้านกระจาย (Disperse Settlement) หมู่บ้านกระจายนี้มีมากในพื้นที่ที่มีการประกอบอาชีพทำสวน เช่น ภาคใต้ ส่วนที่เหลือเป็นหมู่บ้านประเภทตั้งเป็นแนวยาวถนน

สภาพทางเศรษฐ-สังคมของประชาชนในหมู่บ้านที่ทำการสำรวจสรุปได้ดังนี้.-

หมู่บ้านที่ทำการสำรวจทั้ง ๓ ภาค มีจำนวนประชากรต่อหมู่บ้านเฉลี่ย ๕๖๐ คน/หมู่บ้าน จำนวนครอบครัวประมาณ ๑๐๔ ครอบครัว/หมู่บ้าน และจำนวนสมาชิกในครอบครัวเฉลี่ยประมาณ ๖ คน ประชาชนในภาคเหนือ และภาคอีสานส่วนใหญ่ประกอบอาชีพทำนาและทำไร่ ส่วนภาคใต้ประกอบอาชีพทำสวน และประมง เป็นส่วนมาก รายได้เฉลี่ยสูงสุดคือภาคใต้ประมาณ ๒๓,๔๔๔ บาท/ครอบครัว/ปี รองลงมาคือ ภาคเหนือ ๒๒,๔๗๕ บาท/ครอบครัว/ปี ภาคอีสานมีรายได้เฉลี่ยต่ำสุด ๑๔,๒๑๗ บาท/ครอบครัว/ปี ผลวิเคราะห์อัตราการพึ่งพาพบว่าชาวชนบทมีอัตราการพึ่งพาต่ำ ต่ำที่สุดคือ ภาคเหนือ ๑.๖๐๗ ภาคใต้สูงสุดคือ ๑.๔๗๗ใกล้เคียงกับภาคอีสาน ๑.๘๐๗

จากผลสำรวจและวิเคราะห์ดังกล่าวจะเห็นได้ว่าสภาพทางเศรษฐกิจของชาวชนบททั้ง ๓ ภาค อยู่ในระดับที่ไม่สู้ดี รายได้ส่วนใหญ่จะเพียงพอเฉพาะค่าใช้จ่ายในครัวเรือนเท่านั้น จะมีส่วนที่เหลือสำหรับรายจ่ายทางการซ่อมแซม และสร้างที่อยู่อาศัยไม่มากนัก จะมีก็เฉพาะของกลุ่มผู้มีรายได้สูงเท่านั้น จึงพอประเมินได้ว่ากำลังซื้อด้านที่อยู่อาศัย ของชาวชนบทในกลุ่มรายได้ปานกลาง และรายได้ต่ำมีอยู่น้อยมากโดยเฉพาะกลุ่มที่มีรายได้ต่ำ เป็นข้อจำกัดทางการพัฒนาด้านนี้อย่างมาก

- ความพอเพียงของโครงสร้างพื้นฐานและสาธารณะบริการ

ความพอเพียงของโครงสร้างพื้นฐานและสาธารณะบริการยังไม่มีมาตรการที่เหมาะสมเพื่อวัดความพอเพียงนี้สำหรับชุมชนชนบทไทย ในบทความนี้จึงจะกล่าวถึงเฉพาะว่า มีหรือไม่มีโครงสร้างพื้นฐานและสาธารณะบริการในชุมชนชนบทนั้น

ผลการสำรวจได้รวมไว้ในตารางที่ (๒) พบว่าภาคเหนือมีโครงสร้างพื้นฐานและสาธารณะบริการอยู่น้อยที่สุด สิ่งที่ขาดมากคือ สถานีอนามัย สถานีตำรวจและที่ทำการไปรษณีย์ ภาคอีสานขาดที่ทำการไปรษณีย์ และภาคใต้ขาดสถานีตำรวจ

จากผลการสำรวจด้านโครงสร้างพื้นฐาน และสาธารณะบริการนี้ บ่งชี้ให้เห็นถึงปัญหาที่รัฐบาลต้องเผชิญ ซึ่งแยกออกได้เป็น ๒ ประเด็นคือ

ก) ปัญหาในการปรับปรุงโครงสร้างพื้นฐานและสาธารณะบริการที่มีอยู่ให้พอเพียงและปัญหาการจัดหาโครงสร้างพื้นฐานและสาธารณะบริการให้กับส่วนที่ยังขาดอยู่

ข) ปัญหาการจัดลำดับความสำคัญของความต้องการโครงสร้างพื้นฐานและสาธารณะบริการต่าง ๆ และลำดับความสำคัญของหมู่บ้านต่าง ๆ

- ปัญหาและความต้องการ

ทั้งที่มีชุมชนจำนวนไม่น้อยที่ยังขาดโครงสร้างพื้นฐานและสาธารณะบริการที่สำคัญแต่จากผลการสอบถามทัศนคติที่มีต่อชุมชนจากประชาชนในชุมชนพบว่า ส่วนใหญ่ (ประมาณ ๔๐%) มีความพอใจในชุมชนที่อยู่อาศัย เหตุที่เป็นเช่นนี้อาจเป็นเพราะว่าชาวชนบทส่วนใหญ่ยังไม่รู้จะให้ความสนใจต่อสิ่งที่เป็นสาธารณะประโยชน์มากนัก ทั้งนี้ก็เพราะยังมีปัญหาทางเศรษฐกิจของส่วนตัวที่จะต้องแก้ไขอีกมาก

ด้านความต้องการจากผลสอบถามพบว่า ถึงแม้ชาวชนบทจะมีความพอใจในหมู่บ้านของตนเองเป็นส่วนใหญ่ แต่ก็ยังมีความต้องการในโครงสร้างพื้นฐานและสาธารณะบริการดังแสดงไว้ในตารางที่ (๓) เป็นที่น่าสนใจว่า บ้านซึ่งเป็นสิ่งของส่วนบุคคลได้รับความสนใจน้อยกว่าแหล่งน้ำ ถนน และไฟฟ้า ความต้องการบ้านถึงแม้จะได้รับความสนใจน้อยกว่า แต่ก็มีปริมาณความต้องการอยู่ไม่น้อย จึงแสดงให้เห็นว่า บ้านอาจจะไม่เป็นสิ่งที่มีความต้องการอันดับแรก แต่ก็เป็นที่ขาดไม่ได้

(๓) <u>ขอบข่ายและกลยุทธในการพัฒนาที่อยู่อาศัยในชนบท</u>

การพัฒนาที่อยู่อาศัยเป็นงานที่ต้องดำเนินงานผสมผสานกันของหลาย ๆ ฝ่าย

ตารางที่ (๒) ผลการสำรวจองค์ประกอบของหมู่บ้าน

องค์ประกอบ	เปอร์เซนต์การสำรวจหมู่บ้านที่มีโครงสร้างพื้นฐานและการบริการ		
	ภาคเหนือ	ภาคอีสาน	ภาคใต้
โครงสร้างพื้นฐานทางเศรษฐกิจและสังคม			
- โรงเรียน	๘๑	๖๘	๗๑
- สถานีอนามัย	๐	๑๐	๗
- สถานีตำรวจ	๐	๔๒	๐
- ที่ทำการไปรษณีย์	๐	๐	๗
- ศาลาประชาคม	๒๕	๓๖	๗
- สถานที่พักผ่อนหย่อนใจ	๒๕	๔๒	๔๒
- ศูนย์ธุรกิจและการค้า	๑๒	๑๕	๗
- ตลาด	๑๒	๑๖	๑๔
- วัด	๔๓	๑๐	๔๒
พื้นฐานทางด้านสาธารณูปโภคและสาธารณูปการ			
- ไฟฟ้า	๓๗	๓๓	๓๐
- แหล่งน้ำอุปโภค บริโภค	๘๑	๙๔	๘๖
- การกำจัดขยะ	๐	๐	๐
- ระบบระบายน้ำและกำจัดน้ำทิ้ง	๐	๐	๐
โครงสร้างพื้นฐานทางกายภาพเพื่อการพัฒนา			
- ถนน ผิวดินเดิม	๒๒	๓๕	๑๕
ผิวดินลูกรัง	๖๗	๕๘	๗๐
ลาดยาง	๑๑	๗	๑๕
- สหกรณ์	๒๕	๒๖	๗
- ธนาคารผลผลิตหรือฉางรวม	๐	๕	๐

เพื่อให้สามารถแก้ปัญหาที่อยู่อาศัยและก่อให้เกิดผลดีทางเศรษฐกิจและสังคม นอกจากนี้เมื่อเทียบการพัฒนาที่อยู่อาศัยในชนบทกับการพัฒนาที่อยู่อาศัยราคาถูกในเมือง จะเห็นได้ว่าการพัฒนาที่อยู่อาศัยในชนบทจะมีความยุ่งยากมากกว่า ทั้งนี้เพราะอุปสงค์ทางด้านที่อยู่อาศัยในชนบทมีอยู่กระจัดกระจายมาก ชาวชนบทมีกำลังซื้อต่ำ และการที่จะทำให้บรรลุถึงเป้าหมายที่จะก่อให้เกิดการกระตุ้นการเจริญเติบโตทางภาคเศรษฐกิจนั้น จำเป็นต้องใช้ความพยายามอย่างมาก ด้วยตระหนักถึงปัญหาความยุ่งยากในการพัฒนาที่อยู่อาศัยในชนบทดังกล่าว จึงมีความจำเป็นที่จะต้องกำหนดขอบข่ายและกลยุทธในการพัฒนาอย่างรัดกุม ตามหัวข้อคำถามต่อไปนี้.-

(ก) กคช. ควรมีบทบาทอะไร? ในการพัฒนาที่อยู่อาศัยในชนบท

(ข) รูปแบบของการพัฒนาควรเป็นอย่างไร?

(ค) รัฐควรให้การสนับสนุนด้านการเงินอย่างไร?

(ง) จะใช้วัสดุอะไร? เป็นวัสดุก่อสร้างหลักในการพัฒนา

ตารางที่ (๓) ลำดับความต้องการขององค์ประกอบชุมชน

ความต้องการ	ภาคเหนือ (%)	ภาคอีสาน (%)	ภาคใต้ (%)
แหล่งน้ำ	๔๒.๑	๒๔.๑	๒๙.๘
ถนน	๒๔.๓	๒๘.๑	๒๕.๐
ไฟฟ้า	๑๘.๔	๒๖.๕	๒๓.๕
ที่อยู่อาศัย	๑๑.๖	๑๒.๓	๑๗.๔
น้ำประปา	๒.๖	๑.๕	๑.๔
อื่น ๆ	๒.๐	๒.๐	๔.๔

(๓.๑) บทบาทหน้าที่ของ กคช.

ตามที่ได้กล่าวข้างต้นแล้วว่า งานพัฒนาชุมชนชนบทในปัจจุบันมีหน่วยงานรับผิดชอบและดำเนินการอยู่เป็นจำนวนมาก มีการดำเนินงานซ้ำซ้อนกันอยู่หลายส่วน การที่ กคช. จะเข้าไปร่วมพัฒนาตามรูปแบบการดำเนินงานร่วมกันที่มีอยู่เดิมนี้ ก็อาจจะก่อให้เกิดปัญหาการซ้ำซ้อนของงานมากยิ่งขึ้น

หากจะพิจารณาให้ถ่องแท้แล้วจะเห็นว่า ปัญหาการซ้ำซ้อนงานนี้เกิดขึ้นเนื่องจากขาดการประสานแผนงานระหว่างหน่วยงาน และขาดแผนหลักในการดำเนินงาน ทั้งนี้เพราะยังไม่มีหน่วยงานที่ดำเนินการในด้านนี้โดยตรง (๑) จึงขอแนะนำว่า กคช. ควรจะให้ความสนใจในงานส่วนนี้ แต่การที่จะให้ กคช. สามารถดำเนินการได้อย่างมีประสิทธิภาพจำเป็นอย่างยิ่งที่จะต้องจัดให้มีองค์กรระดับชาติที่จะช่วยให้ กคช. สามารถแสดงบทบาทได้เต็มที่

(๓.๒) รูปแบบของการพัฒนา

จากประสบการณ์การพัฒนาที่อยู่อาศัยราคาถูกในเมืองที่ผ่านมา ประกอบกับประสบการณ์การพัฒนาเคหะชนบทที่ดำเนินงานโดย กคช. วท. และหน่วยงานอื่น จึงขอเสนอรูปแบบการพัฒนาที่อยู่อาศัยในชนบทที่ควรเป็นดังนี้.-

<u>รัฐควรจัดหาทองทุนเงินกู้เพื่อให้ชาวชนบทกู้ยืมในรูปของวัสดุก่อสร้างและให้ความช่วยเหลือด้านวิชาการโดยผ่านทาง กคช. และหน่วยงานอื่นที่เกี่ยวข้อง ส่วนด้านการจัดการและแรงงานในการก่อสร้างให้เป็นหน้าที่ของเจ้าของบ้านหรือชุมชนเป็นผู้ดำเนินการเอง ทั้งนี้เพราะชนบทมีพื้นที่กระจัดกระจายมาก การที่รัฐจะยื่นมือเข้าไปจัดการก่อสร้างจะเป็นการลงทุนที่ไม่คุ้มค่า</u>

(๓.๓) เงินอุดหนุนจากรัฐบาล

เพื่อให้เกิดความเสมอภาคระหว่างเมืองและชนบท รัฐจำเป็นที่จะต้องจัดหาเงินอุดหนุนในการพัฒนาที่อยู่อาศัยในชนบท แต่เนื่องจากชนบทมีปริมาณและขนาดกว้างใหญ่ไพศาลมาก

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(๑) ปัจจุบันมีคณะกรรมการกำกับนโยบายเศรษฐกิจแห่งชาติ ซึ่งทำหน้าที่เพียงรวบรวมงานควบคุมและติดตามผลการดำเนินงานเท่านั้น

เมื่อเทียบกับเมือง การช่วยเหลือด้านการเงินจะมีทางเป็นไปได้ก็ต่อเมื่อให้ความช่วยเหลือเฉพาะกลุ่ม เนื่องจากรัฐมีนโยบายที่จะสร้างคุณค่าทางสังคมของประเทศให้สูงขึ้นโดยมุ่งให้ความช่วยเหลือแก่คนที่ยากจนที่สุดก่อน การช่วยเหลือด้านการเงินของรัฐสำหรับด้านที่อยู่อาศัยก็ควรจะมุ่งไปที่ผู้มีรายได้น้อยเป็นหลักโดยอาจจะให้เปล่าบางส่วนหรือให้กู้ยืมในอัตราดอกเบี้ยต่ำ ส่วนผู้มีรายได้ปานกลางและรายได้มากอาจจะให้ความช่วยเหลือบ้าง โดยให้กู้ยืมในรูปของอัตราดอกเบี้ยสูง (ตามอัตราดอกเบี้ยเงินกู้ธนาคาร)

(๓.๔) วัสดุก่อสร้างและเทคโนโลยีการก่อสร้าง

การที่จะทำให้การพัฒนาที่อยู่อาศัยในชนบทสามารถก่อให้เกิดการพัฒนาทางเศรษฐ-สังคมในชนบทได้ขึ้นอยู่กับการเลือกวัสดุก่อสร้างที่เหมาะสมเป็นปัจจัยในการพัฒนา โดยทางทฤษฎีแล้ว เกณฑ์ในการเลือกวัสดุที่เหมาะสมมีดังนี้.-

(ก) ราคาถูก

(ข) ใช้แรงงานเป็นส่วนใหญ่ในการผลิต

(ค) ใช้วัตถุดิบในท้องถิ่น

(ง) สามารถใช้แทนไม้ได้

จากการศึกษาและวิเคราะห์ของ วท. ที่ผ่านมาพบว่าในสภาวะปัจจุบัน "อิฐ-ดินซีเมนต์" หรือ "อิฐพัฒนา" เป็นวัสดุก่อสร้างที่มีศักยภาพสูงสุดที่จะเข้ากับเกณฑ์กำหนดที่กล่าวมาแล้วได้ แต่ควรพัฒนาการนำอิฐ-ดินซีเมนต์ไปใช้ให้ดีกว่าที่เป็นอยู่ปัจจุบัน นอกจากนี้ยังมีวัสดุอื่นอยู่ในเกณฑ์กำหนด เช่น ไม้ไผ่ และวัสดุเหลือทิ้งทางการเกษตรบางอย่าง ซึ่งจะต้องพัฒนาเพื่อนำมาใช้ต่อไป

(๓.๕) การจัดการทางการเงิน

ปัจจุบันยังไม่มีแหล่งเงินใดจัดกองทุนเงินกู้สำหรับการพัฒนาที่อยู่อาศัยโดยตรง ยกเว้นในกรณีมีการตั้งชุมชนใหม่ แต่จากการวิเคราะห์ก้าวล่วงข้อจากผลสำรวจเงินออมของชาวชนบท

ที่แสดงไว้ในตารางที่ (๔) เปรียบเทียบกับราคาบ้านชนบทในปัจจุบัน พบว่าหากสามารถจัดเงินกู้ให้แก่ชาวชนบทในอัตราดอกเบี้ยต่ำ (ไม่เกิน ๘%) ก็จะสามารถช่วยให้ชาวชนบทส่วนใหญ่มีที่อยู่อาศัยในสภาพที่เหมาะสมได้ จึงเป็นที่น่าสนใจว่าหากได้มีการยื่นมือเข้าไปช่วยเหลือในด้านนี้อย่างจริงจัง โดยจัดให้มีระบบจัดการทางการเงินอย่างเหมาะสม ก็จะช่วยให้เกิดการพัฒนาในด้านนี้ได้

สำหรับระบบจัดการทางการเงินนี้ ขอเสนอให้จัดอยู่ในรูปสหกรณ์เคหะ ซึ่งอาศัยแหล่งเงินกู้ช่วยเหลือในระยะแรกรัฐ (โดย กคช.) ในจำนวนประมาณ ๑๐๐ ล้านบาทต่อปี สหกรณ์จัดให้มีการกู้ยืมแก่สมาชิกในรูปของวัสดุก่อสร้าง ในวงเงินไม่เกิน ๑๐,๐๐๐ บาทต่อครอบครัว โดยมีการค้ำประกันจากกลุ่มสมาชิก ซึ่งเป็นวิธีที่คล้ายคลึงกับกลุ่มสหกรณ์การเกษตร

(๓.๖) กลยุทธในการพัฒนา

การดำเนินงานเพื่อพัฒนาที่อยู่อาศัยในชนบทควรมีกลยุทธดังต่อไปนี้.-

(ก) สร้างอุปสงค์และทำให้เป็นกลุ่มก้อนมากขึ้น ทั้งนี้เพราะอุปสงค์ในปัจจุบันมีอยู่น้อยและกระจายตัวกันมาก จำเป็นต้องสร้างอุปสงค์ให้มีเป็นกลุ่มก้อนมากขึ้น เพื่อช่วยให้การดำเนินงานคุ้มต่อการลงทุน

(ข) ชักนำให้เปลี่ยนรูปแบบของอุปสงค์ ทั้งนี้เพราะอุปสงค์ของชาวชนบทในปัจจุบันยังอยู่ในรูปแบบของบ้านไม้หรือบ้านที่ใช้วัสดุราคาแพงในเมืองเป็นส่วนใหญ่ จำเป็นที่จะต้องมีการชักนำให้หันมานิยมบ้านที่ทำด้วยวัสดุที่เหมาะสม เช่น บ้านอิฐดินซีเมนต์ วิธีการที่อาจจะชักนำได้ผลคือ

- ตั้งเป็นเงื่อนไขในการกู้ยืม
- มีการสร้างบ้านอิฐดินซีเมนต์สาธิตให้ทั่วถึง
- สร้างคุณค่าทางสังคมโดยเปลี่ยนชื่อ อิฐดินซีเมนต์ เป็นชื่ออื่นที่ไม่มีคำว่าดินอยู่ เช่น ชื่อ "อิฐพัฒนา" เป็นต้น

(ค) พัฒนาฐานการผลิตอิฐดินซีเมนต์ ทั้งนี้เพราะในการดำเนินงานที่ผ่านมาแต่เดิมมักพยายามให้ผลิตอิฐในระดับครัวเรือน แต่เมื่อวิเคราะห์ความเป็นไปได้ทางเศรษฐกิจแล้วเห็นว่าการผลิตควรอยู่ในระดับอุตสาหกรรมขนาดย่อมมากกว่าระดับครัวเรือน

(ง) ส่งเสริมการใช้อิฐดินซีเมนต์ โดยการส่งเสริมให้ใช้ในงานก่อสร้างประเภทอื่น ๆ ให้มากขึ้นด้วย เช่น ในการก่อสร้างโรงเรียน วัด สถานีอนามัย ที่ทำงานของรัฐ ศาลาประชาคม ฉางรวม หรือแม้แต่บ้านพักข้าราชการ เป็นต้น

ตารางที่ (๔) กำลังเงินชำระคืนของครอบครัวโดยเฉลี่ย

(ระยะเวลาจ่ายคืน ๑๕ ปี)

อัตราดอกเบี้ย	กำลังเงินชำระคืนโดยเฉลี่ย		
	ภาคเหนือ	ภาคอีสาน	ภาคใต้
๓%	๓๖,๑๔๕	๒๔,๑๒๘	๓๐,๑๕๔
๕%	๓๑,๖๑๑	๒๑,๐๗๔	๒๖,๓๔๒
๘%	๒๖,๓๔๒	๑๗,๔๓๘	๒๑,๗๔๗

(๔) องค์กรดำเนินงานและการบริหาร

จากการศึกษาและวิเคราะห์ในรายละเอียดขององค์กรและการดำเนินงานของหน่วยต่าง ๆ ที่เกี่ยวข้อง รวมทั้งของ กคช. เห็นว่าการจัดองค์กรดำเนินงานและโครงสร้างของการบริหารงานควรจะเป็นดังต่อไปนี้.-

ควรจัดให้มีองค์กรและการบริหารใน ๒ ระดับ คือ ระดับชาติ และระดับสถาบัน ดังต่อไปนี้.-

(๔.๑) องค์กรระดับชาติ

ควรอยู่ในรูปของคณะกรรมการ ซึ่งเป็นคณะอนุกรรมการชุดหนึ่งภายใต้การควบคุมของคณะกรรมการพัฒนาชนบทแห่งชาติ ดังแสดงในรูปที่ (๑) คณะอนุกรรมการนี้ควรประกอบด้วยกรรมการที่มาจากหน่วยงานที่เกี่ยวข้องกับการพัฒนาทางกายภาพของชุมชนชนบท โดยมีรายละเอียดในรูปที่(๑) คณะอนุกรรมการชุดนี้อาจใช้ชื่อ "คณะอนุกรรมการพัฒนาทางกายภาพชุมชนชนบท" มีหน้าที่ในการกำหนดแนวนโยบายการพัฒนาทางกายภาพของชุมชนชนบท

โดยเน้นการพัฒนาที่อยู่อาศัยชนบทและมีหน้าที่ประสานแผนและประสานแผนการดำเนินงานการพัฒนาทางกายภาพชุมชนของหน่วยงานต่าง ๆ

(๔.๒) องค์กรระดับสถาบัน

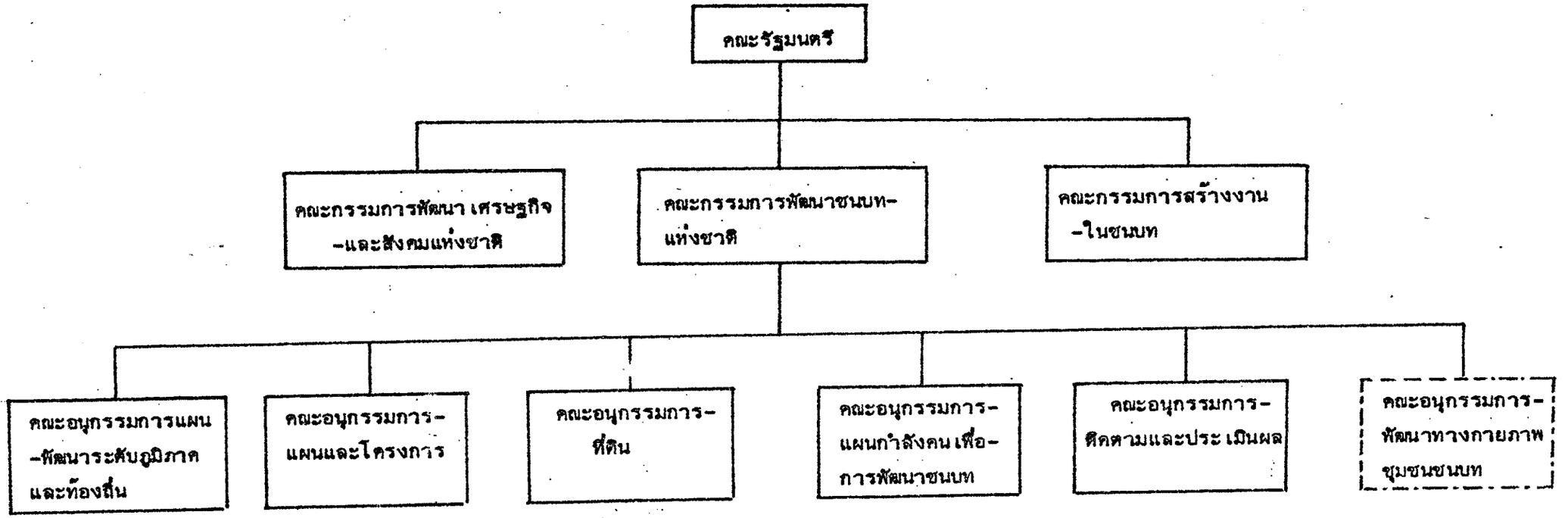
องค์กรระดับสถาบันที่จะมีหน้าที่รับผิดชอบการดำเนินงานด้านการพัฒนาที่อยู่อาศัยชนบทโดยตรง ควรอยู่ในความรับผิดชอบของ กคช. โดยอาจจัดตั้งหน่วยงานใหม่ภายใน กคช. มีหน้าที่รับผิดชอบโดยตรง อาจใช้ชื่อหน่วยงานว่า "สำนักงานพัฒนาเคหะชนบท" หน่วยงานนี้ควรประกอบด้วยบุคคลที่มีความสามารถทางการวางแผนและจัดการสาขาวิชาการต่าง ๆ ที่เกี่ยวข้องคือ นักสังคมศาสตร์ เศรษฐกร วิศวกร และสถาปนิก หน่วยงานนี้จะมีหน้าที่ในการจัดทำรายละเอียดต่าง ๆ ให้แก่คณะกรรมการระดับชาติที่กล่าวมาแล้ว

โครงสร้างของหน่วยงานนี้ควรประกอบด้วยงานด้านต่าง ๆ ๔ งาน ดังแสดงไว้ในรูปที่ (๒) คือ

(ก) งานนโยบายและแผน มีหน้าที่ในการจัดทำและให้คำปรึกษาด้านนโยบายและแผนแก่คณะอนุกรรมการพัฒนาชนบท

(ข) งานออกแบบ มีหน้าที่ในการกำหนดรูปแบบของการพัฒนาทั้งทางด้านเศรษฐกิจ สังคม และกายภาพ และมีหน้าที่ในการอบรมและถ่ายทอดเทคโนโลยี

รูปที่ (๑) คณะกรรมการบริหารการพัฒนาชนบท



หมาย เหตุ ๑) ▭ หน่วยงานที่มีอยู่แล้ว

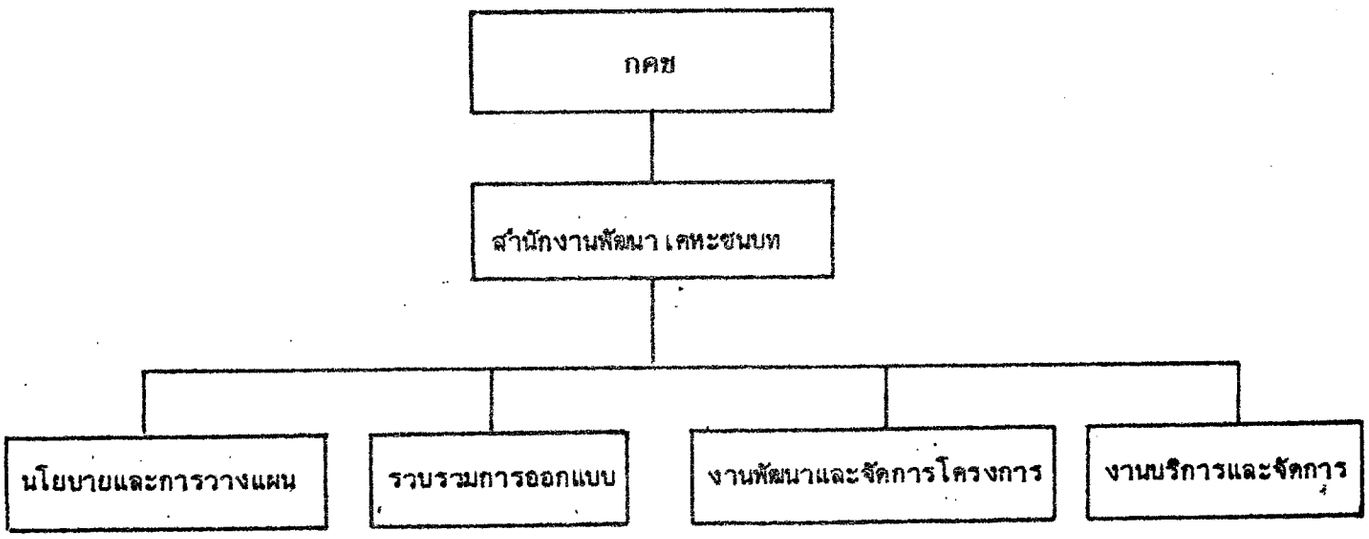
๒) ┄┄┄ หน่วยงานที่จัดตั้งใหม่

๓) ดูรายละเอียดคณะอนุกรรมการในหน้า (หน้าต่อไป)

ประธานคณะอนุกรรมการ	-	ผู้ว่าการเคหะแห่งชาติ
รองประธานคณะอนุกรรมการ	-	รองอธิบดีกรมพัฒนาชุมชน
กรรมการ	-	รองเลขาธิการสำนักงานการปฏิรูปที่ดินเพื่อเกษตรกรรม
" "	-	รองเลขาธิการสำนักงานเร่งรัดพัฒนาชนบท
" "	-	* รองผู้ว่าการการประปาส่วนภูมิภาค
" "	-	* รองผู้ว่าการการไฟฟ้าส่วนภูมิภาค
" "	-	* รองอธิบดีกรมอนามัย
" "	-	* รองอธิบดีกรมโยธาธิการ
" "	-	* รองกรรมการผู้จัดการธนาคารเพื่อการเกษตรและสหกรณ์การเกษตร
" "	-	ผู้แทนกระทรวงศึกษาธิการ
" "	-	ผู้แทนกระทรวงคมนาคม
" "	-	ผู้แทนกองอำนวยการรักษาความมั่นคงภายในประเทศ
" "	-	ผู้แทนสภาพัฒนาเศรษฐกิจและสังคมแห่งชาติ
" "	-	ผู้แทนสำนักงบประมาณ
" "	-	ผู้แทนสำนักงาน ก.พ.
" "	-	ผู้แทนกรมทรัพยากรธรณี
" "	-	ผู้อำนวยการกองนโยบายและแผนกระทรวงมหาดไทย
" "	-	ผู้อำนวยการกองทางหลวงชนบท กรมโยธาธิการ
กรรมการและเลขานุการ	-	ผู้อำนวยการสำนักงานพัฒนาเคหะชนบท การเคหะแห่งชาติ

หมายเหตุ * - หรือ ผู้แทน

รูปที่ (๒) โครงสร้างของหน่วยงาน



(ค) งานพัฒนาและจัดการโครงการ มีหน้าที่วิเคราะห์และจัดทำโครงการตามแนวนโยบายที่ได้รับมา โดยให้เป็นโครงการเหมาะสมและคุ้มแก่การลงทุน และมีหน้าที่ในการจัดการโครงการในระหว่างดำเนินการด้วย

(ง) งานบริการและจัดการ มีหน้าที่ในการบริหารและจัดการ เพื่อตอบสนองความต้องการของงาน (ก) (ข) และ (ค)

ข้อเสนอแนะเพิ่มเติม

ที่กล่าวมาแล้วทั้งหมดเป็นแนวทางในการพัฒนาทางกายภาพของชุมชน โดยเน้นการพัฒนาที่อยู่อาศัย เพื่อให้บรรลุถึงเป้าหมายดังกล่าว ในทางปฏิบัติ กคช. ควรดำเนินการตามขั้นตอนดังต่อไปนี้.-

(ก) กคช. ควรพิจารณาในรายละเอียดของรายงานนี้ พร้อมทั้งตั้งข้อสังเกตสำหรับคณะผู้จัดทำรายงานนำไปปรับปรุงแก้ไข เพื่อให้ได้รายงานที่สมบูรณ์ยิ่งขึ้น

(ข) เมื่อได้รายงานฉบับสมบูรณ์ กคช. ควรนำเสนอรัฐบาลเพื่อขออนุมัติในหลักการเพื่อให้ได้รับความช่วยเหลือทางการเงินบางส่วน และสะดวกต่อการประสานงานกับหน่วยงานอื่น

(ค) พร้อมกับการขออนุมัติในหลักการในข้อ ข. กคช. ควรเสนอขอให้จัดตั้ง "คณะอนุกรรมการพัฒนาทางกายภาพชุมชนชนบท"

(ง) เมื่อได้รับอนุมัติในหลักการแล้ว กคช. ควรจัดตั้งหน่วยงาน "สำนักงานพัฒนาเคหะชนบท" ขึ้น ภายใต้ความรับผิดชอบของ กคช. และหน่วยงานนี้ควรเร่งด่วนจัดทำโครงการเพื่อสาธิตและทดสอบแนวทางและกลยุทธในการพัฒนารูปแบบต่าง ๆ ประมาณ ๒-๓ โครงการ

(จ) เมื่อได้รับประสบการณ์จากโครงการสาธิตแล้ว กคช. จึงควรจัดทำแผนหลักเพื่อดำเนินการ

(ฉ) กคช. ควรสร้างความร่วมมือระหว่างหน่วยงานต่าง ๆ ที่เกี่ยวข้องในการกระตุ้นให้เกิดความต้องการและอุปสงค์ในการพัฒนาฯ และเพื่อถ่ายทอดเทคโนโลยี

(ช) การพัฒนาควรมุ่งไปสู่กลุ่มผู้มีรายได้น้อยเป็นหลัก โดยเน้นความช่วยเหลือด้านการเงินและให้ใช้แรงงานเป็นค่าชดเชย ส่วนกลุ่มผู้มีรายได้ปานกลางและรายได้สูงอาจจัดให้มีกองทุนเงินกู้ในระดับอัตราดอกเบี้ยที่ค่อนข้างสูง

(ซ) กคช. ควรตระหนักถึงความสำคัญของการศึกษาวิจัยและพัฒนาเทคโนโลยีของวัสดุก่อสร้างที่เหมาะสมต่อการพัฒนาที่อยู่อาศัยของแต่ละท้องถิ่นในชนบท และควรสนับสนุนให้มีการดำเนินงานในด้านนี้อย่างจริงจังต่อไปในอนาคต

RECOMMENDATIONS

The findings and our comments presented in chapters I to IV, inclusive would hopefully, provide the NHA with a clear envisaged scenario of PDRS especially RHD. The next stage is the systematic transformation of the envision into physical reality. In this regard, we would like to offer the following recommendations;

(1) The NHA critically reviews this report and presents comments to the study team. The study team will then, respond to the comments and revise the report.

(2) Upon approval of the report, the NHA should recommend the government to recognize RHD as one essential component in the national rural development programme. Without this recognition, rural housing development will have difficulty in obtaining financial support and cooperation from other development agencies:

(3) Concurrently, with the move described in item (2) the NHA should propose to the government the establishment of the SCRS. Whether the government approves this idea or not is not critical to the NHA's activity in rural housing as long as the government recognizes the NHA's role in rural housing development.

(4) The NHA should set up a functional unit to take charge of RHD. The first task of this functional unit is to conduct a project identification study. We strongly recommend that a pilot project should first, be carried out. The project should be designed to serve various objectives, i.e. testing various development concepts and strategies, establishing appropriate development models, and demonstration of the soundness of rural housing development.

(5) The NHA armed with experience gained from the pilot project, then prepares a large-scale implementation plan. The planning process will have to begin with a detailed feasibility study followed by the detailed planning.

(6) The NHA must seek full cooperation from other development agencies since they will play key roles in stimulating the housing need and demand, and in transferring technologies.

(7) In implementing RHD, the least privileged group i.e. the poor group should be the main target group. However, this group has lowest paying capability, and as such they are normally screened out by the price machanism. This group should therefore, receive preferential treatment. Ideally, they must work for what they get. In this regard, they should be employed in building houses and their labour may be accounted as repayment for their houses.

(8) The NHA should recognize the necessity for further research and development of appropriate building materials for RHD. The research and development activities should be an integral part of the RHD programme. In this regard, research projects will have to be designed to meet specific needs spelled out in the RHD programme.

CONTENTS

CONTENTS (Continued)

CONTENTS (Continued)

TABLES

TABLES (Continued)

TABLES (Continued)

FIGURES

FIGURES (Continued)

CHAPTER I
INTRODUCTION

1.1 The study Objective and Output

This report has been prepared by a multidisciplinary study team from the Building Research Division of the Thailand Institute of Scientific and Technological Research (TISTR) at the request of the National Housing Authority (NHA). This report is the result of a 6-months study carried out by the planning team with the assistance of a survey team from the NHA, during the period from April to July, 1981. The prime objective of the study as agreed upon by TISTR and NHA, is:

> " To delineate a policy and operational framework for the NHA to embark upon physical development of rural settlements".

The study outputs are therefore;

(1) A conceptual plan which characterizes and identifies the needs for physical development of rural settlements in the country;

(2) Devises pragmatic development strategies; and

(3) Provides guidelines for implementation.

The conceptual plan will serve as a basis for preparing a master plan and for project development at later stages.

Based upon the poor economic position of the other regions of the country, the available resources have, therefore, avoided attention towards the central region.

1.2 The study Concept

It is well documented that the dualistic socio-economic structure of a less-developed country (LDC) like Thailand has created great disparities between the rural and the urban sectors, which are measurable in terms of the condition of physical living conditions; sources

and levels of incomes; the accessibility to public social services; and the availability of physical social and economic infrastructures.

During the past two decades of centrally planned development, the rural sector has been (largely) by passed in the development process. The past two development decades have seen huge investments in road networks interconnecting rural centres linking with urban centres and in urban physical infrastructures Physical improvement of rural living condition at both household and community levels received inadequate attention from development agencies.

Thus, with the rural family income unable to rise fast ecough to cope with the inflation rate and the cost of living, therefore, living conditions in the rural areas continues to deteriorate. The deterrioration in living conditions is one of the important push factors responsible for rural-to-rural and rural-to-urban migrations which is the basis of political instability in some rural areas. The social and economic goals of rural development, obviously, must be arrested and alleviated in order to narrow the disparity gap which is disruptive and contributive to political instability.

This study has been initiated by the NHA with the proposition that the physical development of rural settlements, if carefully and properly planned and efficiently managed during implemented, can be one of the key strategies for rural development. The proposition is supported by the fact that rural construction is labour intensive, thus creating employment, It will also induce the development of various construction skills which can eventually pay off in future steps of national social and economic development. Moreover, it will lead to the development of alternate construction materials in response to the problem of wood scarcity. Hopefully, small-scale construction industries, utilizing local raw materials, will be developed to serve as seed for further technological innovation and development in and for the rural areas.

The above proposition gives only a "rosy" picture of physical development in rural settlements. In fact, rural housing and community improvement are beset with many problems originating fundamentally from the low purchasing power of most rural families and the socio-cultural constraints. We (the study team) believe that the physical development of

rural living conditions is a very complex issue, not from the hard aspects but from the soft aspects of development. The "How" towards the realization of the proposition is the crux of the complexity. The answers to the "How" will have to be derived from comprehensive analyses of the interralationships of the social, economic, technological, and institutional aspects of the issue.

1.3 The Study Approach

The study approach, is based on the following three fundamental planning questions, which carry wide practical implications:

(1) What needs to be done?

(2) What can be done?

(3) How it should be done?

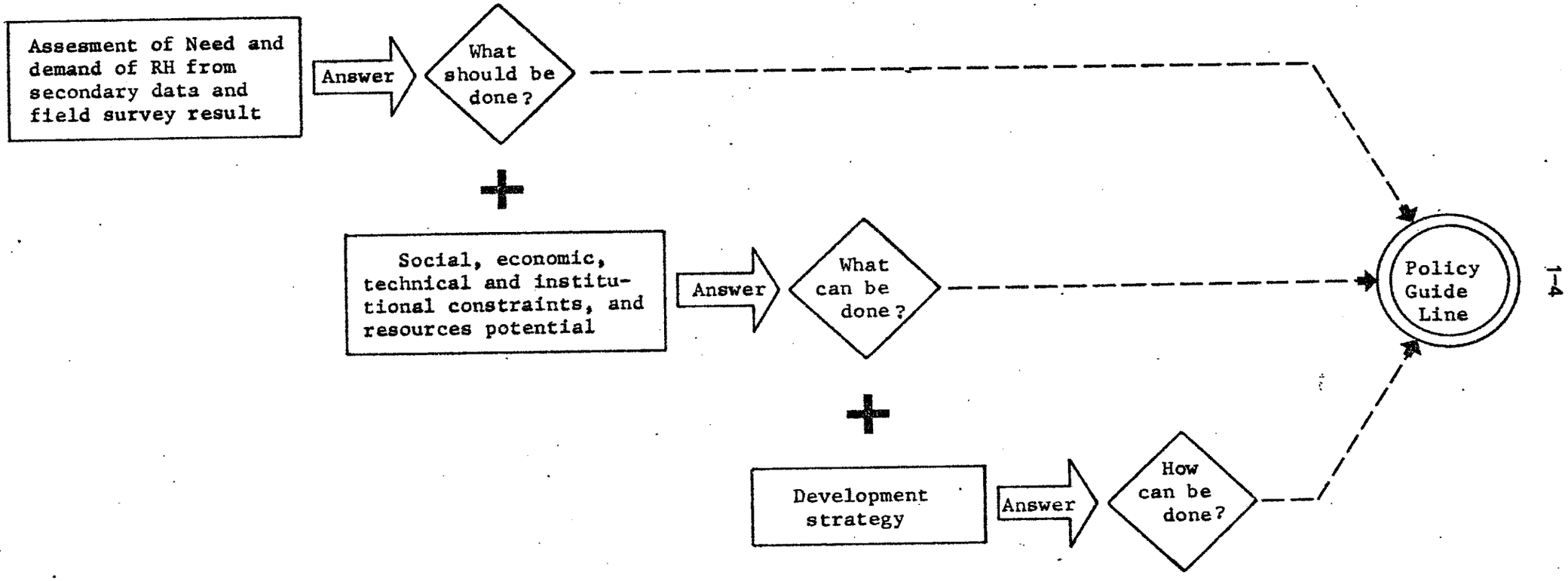
In order to answer the first question, a macro analysis of the rural socio-economic data collected from various secondary sources estimates the rural housing need and demand and identifys needed settlement components in the three geographical regions over the next 5 years. A series of field surveys in "51" representative villages provides the primary data to subsiantiate our estimates (see Appendix 1.1). The field surveys also gives an insight into the characteristics of the development needs at household and community levels.

In response to the second question, the constraints of the physical development of rural settlements due to social, economic, technical and institutional causes are established. The potential of various alternate construction materials is also established. Various alternative development models are designed from an understanding of these constraints and the potentials of alternate resources.

Finally, in response to the last question, various development strategies have been devised, with the inclusion of the institutional and administrative aspects.

Our above described study approach can be best summarized in a diagram in Figure 1.1

Figure 1.1


Assesment of Need and demand of RH from secondary data and field survey result
Answer
What should be done?
Social, economic, technical and institutional constraints, and resources potential
Answer
What can be done?
Development strategy
Answer
How can be done?
Policy Guide Line

CHAPTER II

NEED AND DEMAND ASSESSMENT

In this chapter we present our findings and conclusions concerning the need and demand for physical development of rural settlements (herein after referred to as PDRS), see Appendix 2.1; 2.2; 2.3 and 2.4.

2.1 The Conceptual Framework

In this study, PDRS needs are divided into two categories:

(1) Individual Needs[1] For individual needs we mean the needs pertaining to a house or a dwelling unit. The needs may be in the following forms;

(a) New houses.
(b) Major improvement of existing houses.

(2) Community Needs[1] These are needs pertaining to the whole settlements. The needs may be in the following forms;

(a) Social infrastructures and services.
(b) Public utilities and basic sanitation amenities.
(c) Physical infrastructures for socio-economic development of the settlement.

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(1) In this study it must be understood that the terms NEED and DEMAND are related, but do not convey the same meaning. A farmer may have a NEED for a new house, because his present house is in a poor condition or it does not suit his physical and/or social requirements. His NEED will become DEMAND, only, when he decides to build a new house and he is ready to pay for it at a price acceptable to him. Therefore, DEMAND is associated with the ability and willingness--to pay--without which, NEED will always lie dormant.

It must be explicitly stated here that NEED depends to a great extent on one's culture and value perception in addition to physical requirements. Unfortunately this fact is often overhead in many programmes for PDRS. This is evidenced in the number of cases where many innovative hardware items introduced into villages are not accepted.

Therefore, the development strategies proposed in this report will give full consideration to the culture and value perceptions in relation to the physical requirements of NEED and DEMAND for PDRS.

At present, nearly all of the rural development programmes carried out by many development agencies are designed to meet only the Community Needs component-which should be the responsibility of the government. However, it is doubtful that cost effectiveness can be achieved with just an integration of the various piece-meal development projects which emanated from agencies with unclear and unintegrated policies, objectives, and interests.

Therefore, the concept of integrated planning in response to community needs is strongly advocated. This is emphasized because, without comprehensive planning, development efforts will be scattered and result in confusion, thus the community needs are usually those perceived by the development agencies--without relevance and relationship to the actual community needs as perceived by the people who are members of the recepient communities.

The Individual Needs component receives the least attention from most of the development agencies, the exceptions being with some of the new integrated rural development projects where housing is provided or housing finance is available. The underprivileged rural inhabitants are left to fend for themselves, as far as their housing need is concerned. In contrast, within urban areas, public financed low-cost housing units with long-term loans for such housing are available--with many of these housing units falling into the control of overprivileged speculators and absentee owners. Therefore, the social equity of existing housing development practices is debatable.

Within this conceptual framework the two categories of PDRS needs are examined and the results are presented in the following sections.

2.2 Individual Needs.

In the assessment[2] of individual needs, specifically the

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(2) The assessment of individual needs is analogous to a market survey. The commodity, in this case, is housing support and the prospective customers are rural people. In developing market strategies it is necessary to understand the commodities the prospective customers are using and their preferences, potential needs, potential demands, and their ability to pay.

case of rural housing development, financial profit is definitely NOT the main objective. It is a strange assessment system because the feasibility[2] must be determined from macro socio-economic points of view, while the farmer always makes determinations from micro socio-economic points of view. It is this[2] conceptual difference which is the basic cause of the difficulty in rural housing development.

Secondary data is assessed, according to the above stated concept, and supplemented by primary data obtained from village surveys--with the following results:

2.2.1 Present Housing Situation

A general picture of the present rural housing situation in the three regions appears as;

2.2.1 (1) Typical Design and Layout

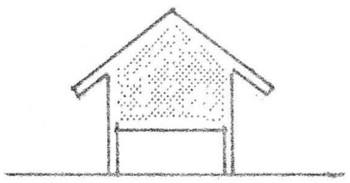
Rural houses have 6 typical designs (as shown in Table 2.1) while Figure 2.1 shows the regional distribution of the 6 designs. Design Type 1 is most common in all the regions. Its popularity is much higher than the second most common design i.e., Design Type 2. Clearly, Design Type 1 reflects to a great extent, indigeneous Thai architecture which indicates that the traditional Thai housing culture is still firmly rooted in rural society. Any attempt to introduce non-traditional designs should be fully aware of this fact.

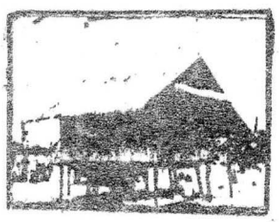
Table 2.1 Percentage Distribution of Rural Houses According to their Design Types.

Design Types	Northern Region	Northeastern Region	Southern Region
Type 1	68.4	52.4	61.7
Type 2	1.9	6.7	2.6
Type 3	0.7	1.3	3.6
Type 4	11.6	16.1	15.8
Type 5	5.8	4.7	9.2
Type 6	11.6	18.8	7.1

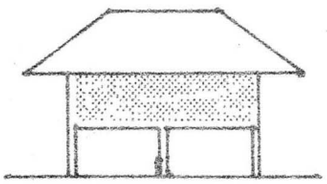
Figure 2.1 : Typical Designs of Rural Houses.

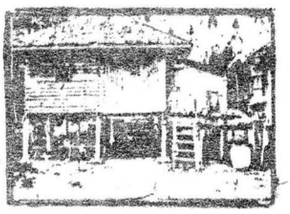
Type 1



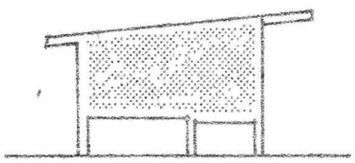


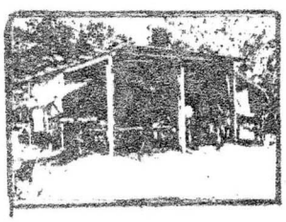
Type 2





Type 3





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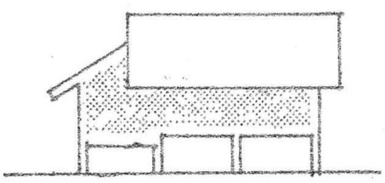

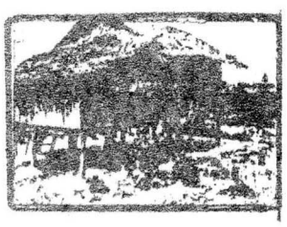

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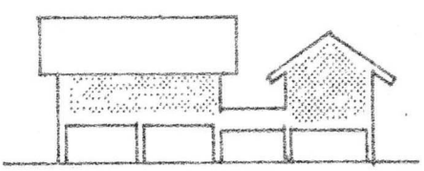

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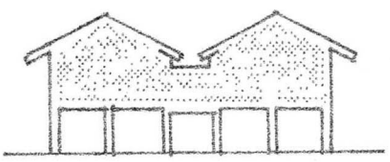
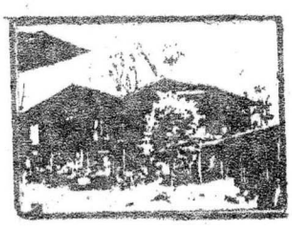




Figures 2.2 shows the typical layouts of rural houses, while Table 2.2 shows that Layout Type A is most common in the 3 regions especially in the northeastern and the southern regions. The Simple rectangular and square plans, with or without terrace, are also commonly found.

The simple designs and layouts of most rural houses, as discussed, reflects the simple style of daily living in the less complex agrarian society. It also indicates adequate space according to needs in combination with socially accepted economic considerations.

Table 2.2 : Percentage Distribution of Rural Houses According to their Layout.

Layout Types	Northern Region	Northeastern Region	Southern Region
Type A	13.5	18.1	18.3
Type B	28.4	8.7	11.2
Type C	29.6	46.3	49.2
Type D	14.2	10.7	8.6
Type E	5.2	5.4	1.5
Type F	3.9	-	4.6
Type G	5.2	10.7	6.6

2.2.1 (2) Functional Components

Rural Houses in the northern and the northeastern regions are normally elevated from 1.50 to 2.50 metres above ground. For the southern region, elevated houses are less common than in the other two regions, as shown in Table 2.3. Space under the houses is normally used for keeping animals (most common in the northeastern region), resting, and making handicrafts.

Figure 2.2 : Typical Layouts of Rural Houses.

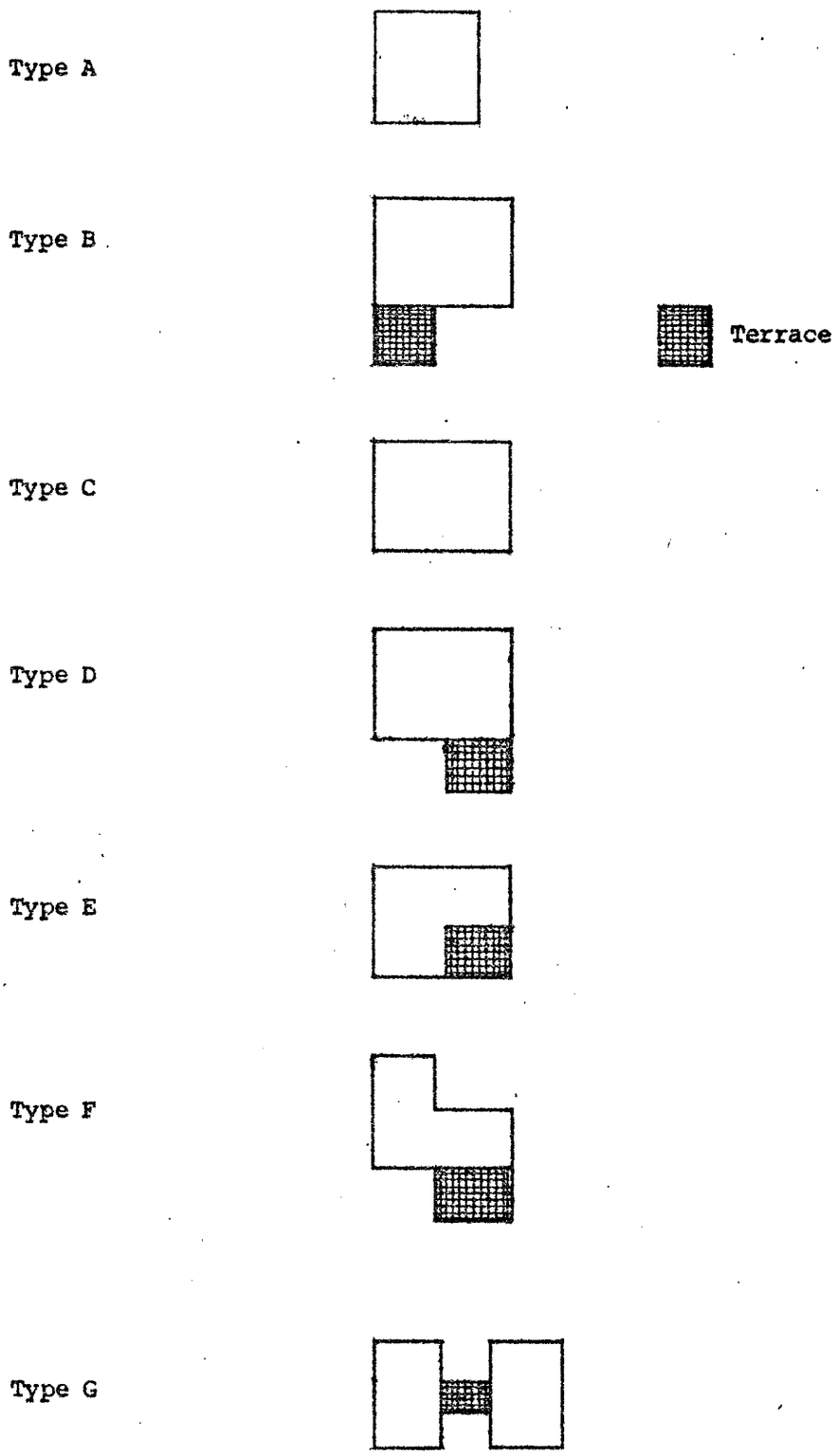


Table 2.3 : Percentage Distribution of Houses.

Type	Northern Region	Northeastern Region	Southern Region
One storey, rested on ground	1.25	6.5	28.67
One storey, elevated not higher than metre above ground	34.38	20.0	24.67
One storey, elevated higher than metres above ground	61.25	69.5	41.33
Two-storey	3.13	4	5.33

Most rural houses have only fundamental functional components i.e., sleeping area, multipurpose area, kitchen, terrace and toilet. The sleeping area, in approximately 50% of the houses, is in the multipurpose area which is also used for receiving guests, eating, resting and working. The toilet is normally located far from the houses. Some houses do not have toilets. A part of the house may be used as grain silo or the silo may be annexed to the house, which more common in the southern region. Table 2.4 summerizes the findings on the functional components of rural houses as briefly discussed above.

Table 2.5 presents the percentage distribution of the space of various components. In all the 3 regions, the multipurpose area takes the largest share of the total housing space. On the average, it can be inferred that the total housing space and the space of each component are acceptable when compared with the minimum rural housing space recommended by TISTR.

Figure 2.3 shows frequency distribution of per capita living space. Based upon the minimum recommended space of 5.07 m^2 per head, it can be concluded that 36.5%, 25.0% and 16.8% of the houses in the southern, northeastern and northern regions, respectively, have less than this minimum space level. These figures serve as criteria for assigning per capita living space into designs for appropriate rural housing in acceptable proportions...as a minimum for all regions and specific areas.

Table 2.4 : Functional Components of Rural Houses.

Functional Components	Northern Region			Northeastern Region			Southern Region		
	A	B	C	A	B	C	A	B	C
I. Living Space									
1.1 Privacy Living Space									
- Partitioned sleeping area	49.5	18.5	3.7	38.1	25.3	3.6	48.9	16.3	2.7
1.2 Partial Privacy Living-Space									
- Sleeping area in the multipurposed area	50.6	14.0	2.8	61.9	19.8	2.8	51.1	13.6	2.3
1.3 Non-Privacy Living Space									
- Multipurposed area	95.5	31.17	4.5	91.1	34.18	4.0	98.7	29.3	3.4
- Terrace	82.0	11.5	2.3	58.2	12.1	1.7	64.2	10.8	1.8
II. Service Space									
1.1 Living Service Space									
- Kitchen	98.1	10.3	2.1	97.6	11.1	1.6	98.0	11.2	1.9
- Indoor bathroom toilet	7.4	-	-	5.5	-	-	10.6	-	-
1.2 Agricultural Service Space									
- Silo in or annexed to the house	15.4	-	-	10.0	-	-	29.6	-	-
- Animal barn under the house	19.7	53.4	10.7	53.4	-	-	5.6	-	-
- Handicraft making area under and on the house	14.7	-	-	15.9	-	-	2.7	-	-

Note: Column (A) = Percentage of houses in each region having that functional component.

Column (B) = Average total space of that functional component.

Column (C) = Average per capita space.

Table 2.5 : Comparison of Living Space with Recommended Minimum Space.

Components	Northern Region		Northeastern Region		Southern Region		Recommended Space	
	Space sq.m.	Percentage of Total	Space sq.m.	Percentage of Total	Space sq.m.	Percentage of Total	Space sq.m.	Percentage of Total
Sleeping area								
- Partitioned bedroom	18.50	25.88	25.3	30.60	16.30	24.12	8.64	25.26
Multipurpose area	31.17	43.61	34.18	41.35	29.30	43.34	12.96	37.89
Kitchen	10.30	14.41	11.10	13.42	11.20	16.57	7.20	21.05
Terrace	11.50	16.09	12.10	14.63	10.80	15.97	5.40	15.79
Total	71.47	100.00	82.68	100.00	67.60	100.00	34.2	100.00

Note: Average family size 6 persons.

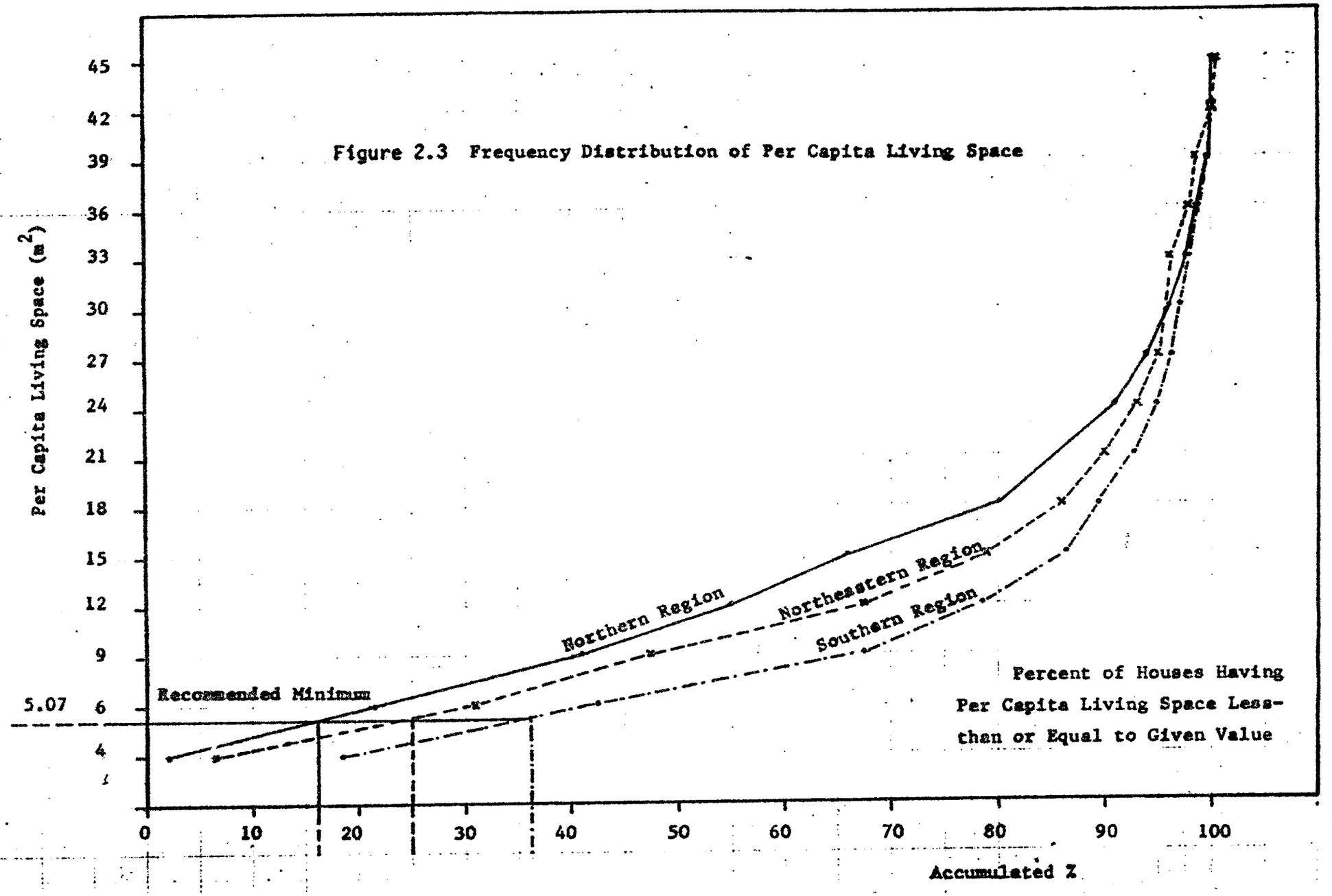


Figure 2.3 Frequency Distribution of Per Capita Living Space

2.2.1 (3) Building Materials and Technology

Survey results, summarized as Table 2.6, indicates that the building materials most commonly utilized for rural housing's various supper structural components are wood (N = 86.33%; NE = 94.62%; S = 97.98% and Average = 92.98%) and bamboo (N = 13.67%; NE = 5.38%; S = 2.02% and Average = 7.02%) which clearly indicates the highest wood usage in the Southern region while the highest bamboo usage is in the Northern region.

Under structure components, however, indicates the utilization of another building material reinforced concrete or brick/soil, as follows, wood (N = 92.41%; NE = 87.40%; S = 70.06% and Average = 83.29%); reinforced concrete (N = 6.30; NE = 11.82%; S = 28.50% and Average = 15.57%); and bamboo (N = 1.21%; NE = 0.78%; S = 1.44% and Average = 1.14%)which cleary indicates that reinforced concrete & the wood is still the most common material for this type of structure, but for the Southern region a greater reliance is being put upon reinforced concrete (28.50%)

Floors (upper and ground) still relies highly upon wood in all regions (especially for the upper floor : N = 87.01%; NE = 98.94%; S = 75.86% and Average = 87.27%) and ground floor: N = 33.33%; NE = 55.55%; S = 34.55% and Average = 41.14%). However, reinforced concrete or brick/soil is more common for the ground floor (Average = 49.67% and highest usage in the Northern region = 66.67%) while wood is the most common for the ground floor of the Northeastern houses (55.55%)

Walls remain dominated by wood (N = 68.06%; NE = 45.79%; S = 45.79% and Average = 58.71%)and bamboo (N = 23.35%; NE = 9.86%; S =13.68% and Average = 15.63%) with reinforced concrete or brick/soil increasingly common in the Southern region (14.21% when the tri-region average is only 5.76%).

Doors, Window, Ceilings and Stairways follows a similar pattern for all regions; and wood, bamboo, corrugated galvanized iron sheets and grass/bamboo mats.

Roofs are predominantly covered over by corrugated galvanized iron sheets (N = 30.28%; NE = 79.54%; S = 19.39% and Average = 43.07%) with

the Northern region displaying the highest reliance upon grass (50.00%) followed by the Southern region (47.88%). However, the Southern region displays the highest utilization of tiles (32.73%).

These findings (as summarized in Table 2.6) indicate that the traditional building materials of the rural people has been wood and bamboo. This is understandable since both, in the past, could be collected from nearly forests or as a part of the land clearing (for arable land) process. As for the wood used for building rural houses, a significant amount is still obtained through direct timber poaching or other illegal means, as indicated by Table 2.7, with 59.86% reported in the Southern region for under structure components.

The usage pattern also indicates, also, that wood's physical attributes, in terms of durability and load bearing, is not the only reasons behind their popularity. A directly related aspect has to do with the level of building technology and types of skills needed for building with wood, while an indirectly related aspect (related to the poaching of preserved timber resources) appears to be related to cultural value, especially that of socio-economic status or standing. This is understandable when the market price of sawn wood during this decade is compared with that of past decades...along with the demand for and abundance or availability of timber and sawn wood from thai forests.

Bamboo, on the other hand, is less durable as a building material because it is highly susceptible to insect and fungus attacks, thus, it is suitable for structures which are not permanent or transient in character. However, one physical attribute is outstanding...springyness..... which makes it most suitable for roofing and wall matting material, where full resistance to the strong tropical storms would require that the entire house is built stronger.

If given a choice between a house built from wood or bamboo, the preference among rural people will be for a wooden house. However, it is not clear if the choice is based upon practical considerations or biases brought about by normative aspirations, cultural value, and/or socio-economic status seeking...although the housing preferences, based upon building materials (see Table 2.8) indicates the highest percentage preference for a wooden house with corrugated galvanized iron roof (N=36.6%; NE=33.8%; and S = 20.1%).

Table 2.6 : Building Materials Used for Various Structural Components of Rural Houses.

Region	Components	Super Structure Components	Under Structure Components	Floor		Wall	Door	Window	Ceiling	Roofing Material	Stair
				Upper	Ground						
Northern Region	Reinforced Concrete or Brick/Soil	-	6.38	-	66.67	1.20	-	-	-	-	-
	Wood	86.33	92.41	87.01	33.33	68.86	71.55	93.06	66.67	-	97.93
	Bamboo	13.67	1.21	12.99	-	23.35	22.41	1.36	-	-	2.07
	Corrugated Galvanized Iron Sheet	-	-	-	-	1.19	5.71	4.16	-	30.28	-
	Tile/Paper	-	-	-	-	- / 1.80	-	-	33.33 / -	19.72 / -	-
	Grass/Bamboo mat	-	-	-	-	1.20 / 2.40	- / 0.86	1.39	-	50.00	-
Northeas-tern Region	Reinforced Concrete or Brick/Soil	-	11.82	-	27.78 / 16.67	1.88	-	-	-	-	-
	Wood	94.62	87.40	98.94	55.55	61.50	67.95	94.62	54.55	-	95.81
	Bamboo	5.38	0.78	1.06	-	9.86	20.44	3.23	-	-	4.19
	Corrugated Galvanized Iron Sheet	-	-	-	-	10.80	5.52	2.15	-	79.54	-
	Tile/Paper	-	-	-	-	0.47 / -	-	-	45.45 / -	8.37 / -	-
	Grass/Bamboo mat	-	-	-	-	1.41 / 14.08	- / 6.08	-	-	12.09 / -	-

(Continued)

Region	Components	Super Structure Components	Under Structure Components	Floor		Wall	Door	Window	Ceiling	Roofing Material	Stair
				Upper	Ground						
Southern Region	Reinforced Concrete or Brick/Soil	-	28.50	-	54.55 / 10.90	14.21	-	-	-	-	-
	Wood	97.98	70.06	75.86	34.55	45.79	78.41	92.63	87.50	-	95.58
	Bamboo	2.02	1.44	24.14	-	13.68	11.51	-	-	-	4.42
	Corrugated Galvanized Iron Sheet	-	-	-	-	11.58	3.60	1.05	-	19.39	-
	Tile/Paper	-	-	-	-	1.05 / 1.05	-	-	12.50 / -	32.73 / -	-
	Grass/Bamboo mat	-	-	-	-	0.53 / 12.11	- / 6.47	6.32	-	47.88 / -	-
Average for 3 Regions	Reinforced Concrete or Brick/Soil	-	15.57	-	49.67 / 9.19	5.76	-	-	-	-	
	Wood	92.98	83.29	87.27	41.14	58.71	72.64	93.43	69.57	-	96.44
	Bamboo	7.02	1.14	12.73	-	15.63	18.12	1.54	-	-	3.56
	Corrugated Galvanized Iron Sheet	-	-	-	-	7.85	4.76	2.45	-	43.07	-
	Tile/Paper	-	-	-	-	0.51 / 0.95	-	-	30.43 / -	20.27 / -	-
	Grass/Bamboo mat	-	-	-	-	1.05 / 9.53	- / 4.47	2.57	-	36.66 / -	-

Table 2.7 : Percentage Distribution of Wood Used for Various Structure Components of Rural House and the Means for Obtaining the Wood.

Components	Northern Region		Northeastern Region		Southern Region	
	Purchase	Illigal Cutting	Purchase	Illigal Cutting	Purchase	Illigal Cutting
Super Structure-Components	47.48	52.52	58.67	41.33	52.93	47.07
Under Structure-Components	43.72	56.28	46.49	53.51	40.14	59.86
Floor	46.67	53.33	50.26	49.74	49.56	50.46
Walls	45.22	54.78	58.78	41.22	64.37	35.63
Doors	100	-	100	-	100	-
Windows	100	-	100	-	100	-
Stair	84.51	15.49	82.51	17.49	53.70	46.30

Table 2.8 : Percentages of Housing Preferences Based on Building Materials.

Type of Houses	Northern Region	Northeastern Region	Southern Region
Bamboo house with thatch roof	6.4	1.5	9.5
Bamboo house with corrugated galvanized iron sheet roof	4.7	3.7	5.5
Wooden house with corrugated galvanized iron roof	36.6	33.8	20.1
Masonary-house with corrugated galvanized iron roof	14.2	15.4	5.0
Masonry house with tile roof	19.0	18.4	47.2

An analysis of the preferences displayed in Table 2.8 does indicate that Southern area rural populations display the highest preference for a masonary house with a tile roof. Such a preference may be based upon the following practical considerations:

a) the availability and competitive cost of building materials suitable for the construction of a masonary house with a tile roof;

b) the relatively uncomplicated construction requirements which is not disrupted by the high humidity and long rainy season;

c) the durability or life expectancy of a masonary house and its tile roof in the environment of high humidity and long rainy season;

d) the greater personal and property security considered to be provided by masonary and tiled houses; and

e) the availability of builders who have skills in building with masonary and tiles.

Points d. and e. have socio-historical reasons and causes which is connected to the migration of Chinese labourers to work in the Southern areas' tin mines and para-rubber plantations during the early Ratanakosin Era.

The above discussed findings have two practical implications. Firstly, attempts to replace wood with new building materials will have to overcome social and cultural barriers. Optimistically, the anticipated rapid price increase and dwindling forest areas will significantly reduce preference for wood. This phenomenon has already happened in urban housing. At present, new wooden houses are rarely seen in urban areas. Brick and cement block houses are the standard norm although floors and super structures are still mainly wooden.

Secondly, the acceptability of masonry houses is next to wooden houses. This might be due to the influence of urban housing culture. However, for elevated houses with underneath open space, using bricks or cement blocks would reguire reinforced concrete supportive structures. This

may pose a difficult problem in rural areas where available building skills are mostly in carpentry.

Considering the structural and architectural designs along with the use of building materials, it can be concluded that building technology in rural housing has really been conservative. Local building materials, apart from wood and bamboo, are rarely used and a large portion of the building materials are from urban-based industries, As wood becomes more and more expensive and locally scarce, rural housing will depend more and more on urban-based building material industry. This condition will push more and more people out of the reach of decent houses. Moreover, it will not be conducive to rural development because more cash will flow out of rural areas for buying materials. This condition must therefore, be rectified and the development of acceptable alternate building materials seems to be the only way out.

2.2.1 (4) Physical Conditions

The survey indicated in Table 2.9 that the majority of Northern region houses have been built within the past five years (53.21%) while a very large proportion (48.45%) of Northeastern region houses have been built within the same period. This phenomenon is important, because it is approximately double the proportion of the houses which have been built in an earlier five years span, 6-10 years old (N = 21.15%; and NE = 20.10%) and four-times the proportion of an earlier 10 years span, 11-15 years old (N = 12.18% and NE = 11.34%).

Taking in demographic, socio-economic and "opportunity" considerations the housing age/growth pattern in the North and Northeast regions implies that external influences have combined with the existant population growth and emigration pattern, such as;

(a) The emigration of younger generation males and females from their rural/farming communities into expanding urbanized and industrializing urban areas...along with those areas which offer recreational services. Within these areas these emigrant youths can obtain incomes which are much higher than the maximum averages obtainable through traditional farming activities within the

communities of their parents. This allowed extensive opportunity to send a proportion of their incomes (not savings) home to their parents, elders, and siblings.

(b) The acquision of basic operators' and construction workers' skills (as truck, tractor and crane drivers; carpenters; masonary workers; etc.) during the period of concentrated U.S. military presence in Northeast, North and East Thailand and within adjacent geo-political areas. However, following the changed form of U.S. military presence in these areas the acquired skills were absorbed partially by the temporary rise in Tourism and the construction of tourism-based service facilities (hotels, restaurants, hospitals/clinics, recreational facilities). At the same time a very high demand for expatriate semi-and skilled workers and engineers within the Middle-East oil producing nations and the manpower-short island nation (Singapore) offered employment opportunities with aspiration satisfying possiblities through good incomes, challenging work, better than at home working conditions, and the added bonus of paid foreign travel. This allowed intensive opportunity to accumulate a "nest egg" along with monthly allocations delivered to parents, elders, siblings, wives (or husbands) and children.

(c) The "exhibitionistic" tendency towards public display of the success of the emigrated or expatriated son, daughter, husband or wife by the "family" who remain on the farm is coupled by the practical consideration of responding to a basic need for shelter, security and privacy which is achieved partially through the possession of a permanent house on self-owned land and the feeling to prove the acceptability of the method of acquiring income by the absentee income provider.

Table 2.9 : Age Distribution of Rural House Sample percent.

Age Range, Years	Northern Region	Northeastern Region	Southern Region
1 - 5	53.21	48.45	26.49
6 - 10	21.15	20.10	24.50
11 - 15	12.18	11.34	11.92
16 - 20	4.49	6.70	11.92
21 - 25	5.13	2.58	9.93
26 - 30	1.28	5.16	4.64
31 - 50	1.28	5.64	7.28
Over 50	0.64	-	0.66
No definite answers	-	1.03	2.65

Taking into account points discussed under a, b, and c. it should be noted that the opportunities connected to the U.S. military presence, the U.S. military withdrawal, the pattern of labour export to the Middle-East oil producing nations and to Singapore, and the development of Pattaya and other holiday and recreation destinations in Thailand have all been within the past two decades, with the concentration being within the mid-seventies. This accounts, in part, for the higher percentages of house ages within the 1-5 and 6-10 years ranges and, because it is well documented that most of the emigrants and expatriates are originally from the northern and northeastern regions it is, therefore, in these two regions that the number of new houses has increased the most.

Points a,b, and c and the data appearing in Table 2.9 partially explains the steady rate of increase of new homes in the Southern region. However, another contributing factor comes from the limited types of economic activities which will generate incomes (rubber and mining) coupled with the existance of masonary and tile housing which has the ability to endure many generations of inhabitants. At the same time, although the per capita incomes of the Southern region appears to be higher than that of the Northern and Northeastern regions it is normal to expect that Southern

families will utilize most of their incomes towards the education of their children, which could be confirmed, partially, by the highest percentage 23%, of Southern houses falling into the poor category while the highest percentage in the poor category (10%) is found in the Northern region, see Table 2.10.

Table 2.10 : Percentage Distribution of Rural Houses According to their Physical Condition.

Physical Condition	Northern Region	Northeastern Region	Southern Region
Very good	3	3	5
Good	25	16	28
Fair	62	67	44
Poor	10	14	23

Table 2.10 also indicates that the total physical condition of rural houses in the Northern (90%) and Northeastern (86%) regions are fair or better with the fair category alone accounting for 62% and 67% of all houses, respectively. It can, therefore, be inferred that better building materials must be developed and introduced to house builders and those who demand new homes. At the same time it can be inferred that knowledge and skills for designing and utilizing better building materials, at competitive prices, will have to be imparted to builders and future home owners.

It should also be quite clear that, in the cases where new houses are poorly built and are built with poor quality materials, the builders have insufficient experience and skills..possibly caused by the high foreign labour market demands for skilled construction workers. Thus, one practical implication must include the training of a large number of new skilled construction workers to replace the indigenous and, now, expatriate skilled workers. However, economic constraints should not be neglected in the consideration of practical solutions to house construction quality

(physical condition) problems, because of the inflationary and recessionary trend of the national economy and the depreciation of the Baht's purchasing power.

2.2.1 (5) Problems and Needs as Perceived by House Owners.

From the results of interview with the house owners, it is indicated that a large percentage of them are not satisfied with their houses as can be seen from the data in Table 2.11, with the level of dissatisfaction highest (62.94%) in the Northeastern region. Dissatisfaction with the inadequate amount of living space is the highest (N = 45.07%; NE = 38.71%; and S = 33.90%) as earlier noted in Section 2.2.1 (1).

A very curious indication, from Table 2.11, is that 25 percent of the expressed dissatisfaction displayed by Northeastern families for their houses is towards the "unfinished" condition. This may have close relationship with the low per capita incomes, the inablity to acquire building materials with their low incomes, and the survival instinct which creates the practical input of the major proportion of incomes and energies into food acquisition along with early and prolific reproduction. Thus, the practical implication for the Northeastern region's housing problems will call for a combination between increasing purchasing power through increased agricultural activities and the introduction of value adding cottage and small industries...along with family planning incentives.

Table 2.11 : Percentage Distribution of Families According to Their Attitudes Towards Their Houses.

Attitudes	Northern	Northeastern	Southern
House Satisfaction	45.80	37.06	59.86
House Dissatisfaction	54.20	62.94	40.14
- house conditions	12.68	8.87	27.12
- living space	45.07	38.71	33.90
- materials	11.27	10.48	16.95
- comfort	11.27	2.42	3.37
- unfinished	9.86	25.00	10.17
- no answers	9.86	14.52	8.47

The house owners indicated the highest house improvement need (see Table 2.12) in the form of extension and expansion of existing household space, curiously, this need is strongly expressed for Southern region houses (38.73%) where their expressed dissatisfaction is the lowest of all three provinces, according to Table 2.11.

On the other hand, Northern region house owners also expressed a high need to improve houses through extension and expansion (21.90% in Table 2.12) however, their attitude towards rebuilding (22.63%) and changing floors and roofs (10.22%) which, also curiously, is inconsistent with their expressed dissatisfaction with their living space and housing conditions (45.07% and 12.68%, respectively, in Table 2.11).

Table 2.12 : Percentage Distribution of House Improvement Needs.

Needs for Improvement	Northern	Northeastern	Southern
Rebuild	22.63	20.22	19.72
Change Floors and roofs	10.22	8.74	9.86
Change Floors and walls	8.76	6.01	4.93
Extension and expansion	21.90	25.69	38.73
Repair	7.30	11.48	11.27
Modification	1.46	2.73	-
No answers	27.74	25.14	15.49

Table 2.13 : Percentage Distribution of Problems Concerning the Functioning of the Houses

Problem	Northern	Northeastern	Southern
Too hot	6.92	8.16	1.36
Rain splashing	19.23	35.20	12.93
Leak	20.00	4.08	10.20
Too old	3.08	2.04	1.36
Deteriorating	9.23	8.67	20.41
Too Crowded	12.31	9.18	9.52
Poor ventilation	2.31	1.53	2.72
No answers	26.91	31.12	41.50

The explanation of the expressed need to extend and expand the existing household space of Southern region houses may stem from the observation that the houses are old and deteriorating (20.41% in Table 2.13) in combination with the too crowded and poor ventilation (9.52% and 2.72% in Table 2.13) and leakage and rain splashing (10.20% and 12.93% in Table 2.13) conditions. It is important to note that a significant percentage (41.3%) of the interviewed Southern region house owners did not respond nor perceive problems related to the function of their houses. Thus, these findings indicate that any practical assistance in rural housing will have to be based upon the improvement of existing houses, before considering rebuilding assistance, because an improvement programme is within the feasible range of family income of the majority of families.

As can be seen from the relationship between functional house problems and family incomes, shown in Table 2.14, and the relationship between improvement needs and family incomes, shown in Table 2.15, it can be concluded that the structure of the problem and the needs are not significantly different for each income level. However, the context of the problems and the needs are different for each income level, especially within the context of current recessionary and inflationary trends of sectorial, national and global magnitudes.

Table 2.14 : Relationship between Functional House Problems and Family Incomes.

Problems	Income Level, Baht/year		
Northern Region	Under 13,000	13,000-28,000	Over 28,000
No problems	60.8	43.9	39.5
Have problems	39.2	56.1	60.6
- Poor physical condition	(3.9)	(7.3)	(13.2)
- Limited space	(21.6)	(24.4)	(39.5)
- Inappropriate materials	(5.9)	(22.0)	(2.6)
- Uncomfortable	(7.8)	(2.4)	(5.3)
Northeastern Region	Under 13,000	13,000-28,000	Over 28,000
No problems	40.8	41.0	70.6
Have problems	59.2	59.0	29.5
- Poor physical condition	(8.2)	(8.2)	(11.8)
- Limited space	(38.8)	(36.1)	(11.8)
- Inappropriate materials	(12.2)	(9.8)	(5.9)
Southern Region	Under 23,000	23,000-33,000	Over 33,000
No problems	55.3	70.6	67.2
Have problems	44.8	29.5	32.8
- Poor physical condition	(12.8)	(11.8)	(10.9)
- Limited space	(32.3)	(11.8)	(12.5)
- Inappropriate materials	(6.4)	(5.9)	(9.4)
- Uncomfortable	(4.3)	(-)	(-)

Table 2.15 : Relationship between Improvement Needs and Family Incomes.

Improvement Needs	Income Level, Baht/year		
Northern Region	Under 13,000	13,000-28,000	Over 28,000
Rebuilding	36.7	35.9	32.6
Material replacement	33.3	23.1	32.6
House extension	20.0	28.2	26.1
Repair	10.0	12.8	8.7
Northeastern Region	Under 13,000	13,000-28,000	Over 28,000
Rebuilding	27.5	29.0	6.7
Material replacement	15.7	23.2	26.7
House extension	35.3	30.4	26.7
Repair	21.6	17.4	40.0
Southern Region	Under 23,000	23,000-33,000	Over 33,000
Rebuilding	25.0	6.3	25.5
Material replacement	11.4	18.8	29.1
House extension	45.5	68.8	32.7
Repair	18.2	6.3	12.7

2.2.1 (6) Cost of Houses

In this study the cost of rural houses in each region is indicated through the data available from Table 2.16 and 2.17 which, respectively, indicates that the expenditures for the purchased portion of building materials per rural house...in the majority...will not exceed 10,000 bahts (Table 2.16) and the labour expenditures...in the majority... will not exceed 5,000 bahts (Table 2.17) and dependent upon the current self labour contributions of the three regions (N = 52.4%; NE = 38.5%; S = 50.3% in Table 2.17). Therefore, the explicit cost of rural houses will not exceed 15,000 bahts...in the majority...and dependent upon the current self labour inputs proportion.

The implicit costs are still unquantified, because a significant proportion of the building materials are indigenous and not obtained through the market system. However, in 2.2.1 (3) Building Materials and Technology and Table 2.6, it is apparent that the implicit costs can be determined, roughly, because the explicit expenditures for building materials will be for corrugated galvanized iron sheet, cement, nails, reinforcement iron rods, roofing tiles, bricks and aggregates or wood, and bamboo.

Thus, the actual total cost of the majority of rural houses must be more than 15,000 bahts, however, it should not be greater than 30,000 bahts.

Table 2.16 : Cost of Purchased Portion of Building Material Per Rural House.

Cost Group (Bahts)	Region(%)		
	Northern	Northeastern	Southern
Under 10,000	65.9	67.5	58.2
10,001 - 20,000	17.0	16.2	19.1
20,001 - 30,000	5.9	4.0	8.0
30,001 - 40,000	1.4	1.5	3.3
Above 40,001	3.9	10.7	7.9
No Response	5.9	-	3.4

Table 2.17: Labour Costs in Building a Rural House.

Cost (Baht)	Region(%)		
	Northern	Northeastern	Southern
Self Labour	52.4	38.5	50.3
Under 5,000	23.5	33.4	25.9
5,001 -10,000	2.7	4.2	4.1
Above 10,001	0.7	0.5	1.4
No Response	20.7	23.4	18.3

2.2.2 Need and Demand for New Houses

The need for new houses can be divided into 2 groups, the first group consisting of married couples who moved from their parents' houses or immigrated from the other areas. The second group is the need of house owners who want to demolish their existing houses and build new ones.

For the first group of need, an estimation from past records of the existant number of rural houses is made, as shown in Table 2.18, with population size also indicated on yearly basis.

It is clear that there is no correlation between the rate of population increase and the rate of house increase. Also, the annual variation of the rate of house increase for each region widely fluctuates and does not exhibit a clear trend. Therefore, the long-term average rate of house increase, respectively, N = 2.76%; NE = 2.46%; and S = 2.41% (see Table 2.18) is used as the basis for the estimation. Table 2.19 presents the results of estimation, which is the demand forecast since it should indicate the actual number of new houses which will be built. The total annual demand in 1986 is estimated at 133,692 houses, of which nearly half (62,593 houses) should be in the northeastern region (see Table 2.19).

The second group of need (Table 2.20) is estimated from the percentage of house owners who expressed their desire to demolish their existing houses and build new ones and the number of existing houses, an

estimation indicates that there will be a total need for 951,415 new houses.

It should be noted that this total need will not become demand, within one year, but it will gradually become demand at a rate which is influenced by the purchasing power and physical condition of the existing houses.

The estimated total demand for all three regions over a 5-year period (1982-86) should be 1,079,049 houses, while the average annual demand over the same 5-year period should be 215,810 houses, see Table 2.21, which would mean a demand rate of, approximately, 200,000 housing units per year total for all regions.

This demand rate, clearly, can change with the fluctuation in the key conditions which influences the variables controlling the feasibility of changing housing need into housing demand. Therefore, these demand figures (in Table 2.21) serves as a rough indication of the magnitude of the demand. More accurate and sensitive demand analyses and prognosis will be necessary in order to give greater assurance to the practicality and feasibility of the detailed planning stage....the exception implied will be the balance and trade-offs necessary for providing one or a combination of the three key administrative sources of security and satisfaction, namely, the social, economic and political objectives, needs and demands.

2.3 Community Needs.

Unlike individual needs, community needs are taken for granted as being the government's responsibility. This means that the government must invest in various infrastructures and services needed by the community. Therefore, it is normally, the government's decision as to where, what and when the community needs should be responded to. The matter clearly left in the hands of the government and its development agencies, although the people are able to voice their needs through some channels, such as the village, tambon, amphur and provincial councils members of parliament.

The crucial issues in meeting the community needs are therefore, how to determine priority needs, how to meet the needs in the

Table 2.18 : Rural Population and Existant Number of Rural Houses.

Year	Northern Region				Northeastern Region				Southern Region			
	(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)
1967	6,583,220	1,117,948	-	-	10,428,768	1,662,217	-	-	3,548,161	572,195	-	-
1968	6,774,200	1,150,908	2.95	2.90	10,786,466	1,785,690	7.43	3.43	3,656,166	589,293	2.99	3.04
1969	6,939,434	1,239,375	7.69	2.44	11,142,129	1,771,824	0.78	3.30	3,772,749	594,499	0.88	3.19
1970	7,081,529	1,253,915	1.17	2.05	11,478,171	1,792,171	1.17	3.02	3,884,041	605,119	1.79	2.95
1971	7,329,227	1,283,173	2.33	3.50	11,866,276	1,815,210	1.27	3.38	4,027,447	615,014	1.64	3.69
1972	7,573,137	1,331,886	3.63	3.33	12,446,731	1,868,473	2.93	4.89	4,241,851	638,136	3.76	5.32
1973	7,905,207	1,326,519	-0.40	4.38	13,098,809	2,001,761	7.13	5.24	4,377,267	669,375	4.90	3.19
1974	8,185,113	1,400,289	5.56	3.54	13,531,123	2,062,714	3.04	3.30	4,515,965	612,812	-8.45	3.17
1975	8,323,465	1,402,583	0.16	1.69	13,912,001	2,081,577	0.91	2.81	4,629,667	710,703	15.97	2.52
1976	8,469,162	1,388,180	-1.03	1.75	14,589,998	2,008,559	-3.51	1.78	4,726,761	695,755	-2.10	2.10
1977	8,573,330	1,472,163	6.04	1.23	14,500,746	2,063,172	2.72	2.41	4,830,783	718,228	3.23	2.20
1978	8,716,962	1,509,302	2.52	1.68	14,834,062	2,144,263	3.93	2.30	4,915,594	728,758	1.47	1.76
1979	8,827,079	1,546,353	2.45	1.26	15,118,121	2,199,181	2.56	1.91	5,026,546	749,793	2.89	2.56
Average			2.76				2.46				2.41	

Note: (A) Population

(B) Number of houses

(C) Annual rate of house increase

(D) Annual rate of population increase

Table 2.19 : Estimation of the First Group of Needs for New Houses.

Year	Northern Region		Northeastern Region		Southern Region	
	Number of Houses	Demand	Number of Houses	Demand	Number of Houses	Demand
1979	1,546,353	-	2,199,181	-	749,793	-
1980	1,589,032	42,679	2,253,281	54,100	767,863	18,070
1981	1,632,889	43,857	2,308,712	55,431	786,369	18,506
1982	1,677,957	45,068	2,365,506	56,794	805,321	18,952
1983	1,724,269	46,312	2,423,697	58,191	824,729	19,408
1984	1,771,859	47,590	2,483,320	59,623	844,605	19,876
1985	1,820,762	48,903	2,544,410	61,090	864,960	20,355
1986	1,871,015	50,253	2,607,003	62,593	885,806	20,846
1987	1,922,655	51,640	2,671,135	64,132	907,154	21,348
1988	1,975,720	53,065	2,736,845	65,710	929,016	22,000
1989	2,030,250	54,530	2,804,171	67,326	951,405	22,389
1990	2,086,285	56,035	2,873,154	68,983	974,334	22,929

Table 2.20 : Estimation of the Second Group of Needs for New Houses.

Categories	Region			Total
	Northern	Northeastern	Southern	
Estimated number of houses in 1981	1,632,889	2,308,712	786,369	4,727,970
Percentage of need for new houses	22.63	20.22	19.72	20.85
Total need for new houses	369,522	466,821	115,072	[illegible]
Demand per annum	30,289	42,323	16,027	88,639
Rate of House Replacement	1.85%	1.83%	2.03%	1.93%

Table 2.21 : Estimated Total Demand for New Houses.

Year	Region			Total
	Northern (1)	Northeastern (2)	Southern (3)	(1 + 2 + 3)
1982	75,357	99,113	34,979	209,453
1983	76,601	100,514	35,435	212,550
1984	77,879	101,946	35,903	215,728
1985	79,192	105,413	36,382	218,987
1986	80,542	104,916	36,873	222,331
Total Demand, over 5-year period				1,079,049
Average Annual Demand, over 5-year period				215,810

most cost effective and most acceptable ways, and how to induce the people in the communities to help maintain the provided facilities and services in good functional condition....voluntarily.

The above discussed concept is the basis upon which community need is determined and the assessment is based upon direct village surveys and intuition from experience.

2.3.1 Existing Condition

2.3.1 (1) Basic Background of the Study Settlements.

The field survey covers 51 villages in the 3 regions and their regional distribution and settlement pattern appears in Table 2.22. The names and locations of the survey villages are listed under Appendix 1.1 Table A-4. In the northern and the northeastern regions most of the survey villages are cluster settlements (N = 12/16 and NE = 17/20) while in the southern region scattered (6/15) and cluster types (8/15) of settlements are nearly equally dominant. Line settlements are few (one each) in all the 3 regions while scattered settlements are more common (N = 3; NE = 2 and S = 8).

The cluster type villages are simpler and less expensive for providing the essential infrastructures and services, because of the economy of scale and high intensity of demand per unit area. However, this type of settlement, if haphazardly expanded, will easily create adverse community environment which in turn can seriously affect the quality of life of individuals in the community. The social and economic profiles of the survey villages are summarized in Table 2.23.

2.3.2 Adequacy of Infrastructures and Public Services

Table 2.24 summarizes the existence of infrastructures and public services in the survey villages. Apparently, the list is a long one and commercial services are certainly not the government's responsibility. It is added into the list (only) to serve as an indicator of the level of economic development of the villages. It should also be noted that the existence, of an infrastructure or a public service, does not always mean adequacy. Admittedly, the question of adequacy of public infrastructures

Table 2.22 : Distribution of the Survey Villages According to Region and Settlement Pattern.

Particulars	Northern Region	Northeastern Region	Southern Region
Number of villages	16	20	15
Cluster Settlement	12	17	6
- Line settlement	1	1	1
- Scattered settlement	3	2	8

Table 2.23 : Social and Economic Profiles of the Survey Villages.

Patticulars	Northern Region	Northeastern Region	Southern Region
Total population	11,248	11,893	7,447
Average population/village	703.0	594.7	496.5
Total number of families	2,159.0	1,950.0	1,370.0
Average number of families	134.9	97.5	91.3
Average family size	5.2	6.1	5.4
Major economic base	Rice farming	Rice farming and corn growing	Rubber plantation and frshery
Family income, baht/year	Under 13,000-over 28,000	Under 13,000 -over 28,000	Under 2,300 - over 33,000
Average family income, baht/year	16,730.-	12,558.-	26,268.-
Average rate of dependency	1.607	1.807	1.937

and services in the rural context is very controversial since there is no standard to compare with. However, in this study there is an attempt to work out rough indexes of adequacy for selected essential services, as presented in Table 2.24, with the understanding that they are to be utilized only for the comparison between the three regions.

Before dwelling upon the issue of adequacy, it is necessary todeal with the issue of existence or non-existence of an infrastructure or a public service. In this regard, the northern region appears to be the most unfortunate, because none of the survey villages displayed the existence of six infrastructures/public services, namely, health centres, police outposts, post office, and communal grain silos. In the northeastern region, only the post offices are non-existant, while in the southern region only the police outposts and the communal silos are non-existant.

In all the villages refuse collection and disposal services, and drainage and sewerage amenities are non-existant. Thus, if these villages expand and the population density increases, the environmental health condition can be expected to deteriorate in relative proportion.

Within each region, the percentage of existence of each infrastructure and service indicates the extent of provision of the infrastructure and the service. For example, 32% of the survey villages in the northeastern region still have no schools and 90% do not have health care centres. The government therefore, faces 2 basic problems namely, one: how to allocate the resources for improving the adequacy of the existing services and infrastructures while providing the services and infrastructures to villages in which hitherto, such services and infrastructures has been non-existent; and, two: how to match and prioritize the needs and the villages. These two problems appear insurmountable within the existing system of discrete planning and overlapping responsibilities among the various development agencies and implementation agencies.

2.3.3 Problems and Needs as Perceived by Villages.

Despite the non-existence and inadequacy of various community services and infrastructures, nearly all respondents are content with their villages, as shown by Table 2.25. The majority of them are content with

Table 2.24 : Existence of Infrastructures and Public Services in the Survey Villages.

Type	Percentage of Survey Villages Having the Services or Infrastructures (%)		
	Northern Region	Northeastern Region	Southern Region
Social infrastructures and services			
- Schools	81	68	71
- Health centres	-	10	7
- Police outposts	-	42	-
- Post office	-	-	7
- Community halls	25	36	7
- Recreation areas	25	42	42
- Commercial services	12	15	7
- Market places	12	16	14
- Monasteries	43	10	42
Public utilities and basic sanitation amenities			
- Electricity	37	33	30
- Water sources for domestic consumption	81	94	86
- Refuse disposal	-	-	-
- Drainage and sewerage	-	-	-
Physical infrastructures for development			
- Roads, earth roads	22	35	15
laterite roads	67	58	70
paved roads	11	7	15
- Cooperatives	25	26	7
- Communal grain silo	-	5	-

Table 2.25 : Attitudes Towards the Communities.

Attitudes	Northern Region(%)	Northeastern Region(%)	Southern Region(%)
Total of Satisfied Respondents	90.8	92	89.3
Reason:			
- No reason given	5.9	9.9	7.4
- Home town	5.3	19.2	16.8
- Easy to earn a living	23.7	20.2	4.7
- Good environment	55.9	42.7	60.4
Total of Unsatisfied Respondents	9.1	8.3	10.8
Reason			
- No reason given	1.3	1.0	2.0
- Difficult to earn a living	3.9	3.6	4.7
- Inconvenience in communicating with outside	1.3	1.6	3.4
- Poor public utilities	2.6	2.1	0.7

Table 2.26 : Priority Community Needs as Perceived by the Villagers (Arranged According to Percentage of Respondents).

Needs	Northern Region(%)	Northeastern Region(%)	Southern Region(%)
Water sources	42.1	29.1	27.8
Road	24.3	28.1	25.0
Electricity	18.4	26.5	23.5
Housing	10.6	12.3	17.4
Piped Water Supply	2.6	1.5	1.4
Others	2.0	2.0	4.9

the community environment (N = 90.8%; NE = 92.0%; S = 89.3%). However, this is only a broad general attitude towards one's settlement. It does not reflect his or her satisfaction with the provided public services and facilities. It is also natural that a poor farmer would have less interest in communal services and facilities, as long as, he still has to struggle to make ends meet.

When asked about their community needs, the respondents specified their various needs as summarized in Table 2.26. It is interesting to note that the needs of the 3 regions have 2 similar pattern/order of priority. The top priority need identified is water sources, especially in the northern region (42.1%). It should be noted that piped water supply receives lowest priority (N = 2.6%; NE = 1.5%; S = 1.4%). Another point is that of housing, and in this case, it is considered a community component and its priority is lower than water sources, roads, and electricity (housing: N = 10.6%; NE = 12.3%; and S = 17.4%).

The finding that in the northeastern region, water source is not a distinct need, compared with roads and electricity, is rather surprising since the northeastern region is well known for its water scarcity. One plausible explanation may be that the northeastern villages have received more assistance in village-scale water resources development than the northern villages. Also, since piped watersupply is the lowest in the need list, it may be inferred that, the need of most villagers is just for decent water sources where they can go and fetch water by themselves, while piped water supply may be regarded as sociologically and financially unacceptable to the conservative villagers.

The finding that housing receives less attention than water, roads, and electricity, should not be surprising since most of the rural houses are still in fair condition. In addition, a large percentate of rural people still regard housing as their responsibility. This indicates that, at present, most rural people would want accept improvements in community infrastructures and utilities, before housing improvement.

Thus, one general policy implication is that, the provision of community infrastructures and utilities should receive more resources than housing. However, it does not mean that housing improvement should be

completely ignored. Instead, the housing need is confirmed and responses to this basic need must be initiated now, even on a modest scale.

CHAPTER III

PROPOSED FRAMEWORK AND STRATEGIES FOR RURAL HOUSING DEVELOPMENT

Housing development is essentially an appropriate mix of activities designed to solve housing problems, and strive for the desired social and economic benefits. In this chapter, we endeavour to define a framework and strategies for the rural housing development (RHD) activities.

3.1 Conceptual Framework

Compared with urban low-cost housing development, RHD is more difficult because of the dispersed demand, low-purchasing power, and the desirability for RHD to create rural employment and industry. Consequently, the RHD framework and strategies would be entirely different from those of urban low-cost housing development.

In developing the framework and strategies for RHD, this study employs a reverse thinking approach. It begins with the question.. ..."Where will the money come from? ". This question is then followed by a series of questions as follows:

(1) What should be the role(s) of NHA in RHD?
(2) What should be the development pattern?
(3) What should be the subsidy programme?
(4) What building materials RHD should be based on?

Answers for these questions form the basis from which the RHD framework and strategies are defined.

3.2 Roles of NHA

As pointed out earlier, community need is the area which receives the most attention. There are many agencies actively involved in providing rural communities with various public infrastractures and services. Table 3.1 presents information on the roles of the 11 key development agencies. It is clear that there is a certain degree of overlapping in responsibilities,thus causing unbalanced and over-intensified of equipment, man-power, budgets and authority which results in confusion in many key areas. For example, Water for Consumptive Use is provided by the Department of Health and the Provincial Water Works Authority while Water Sources

Table 3.1 : Government Agencies Concerned with PDRS.

Agency	Road	Water Sources	Piped Water-Supply	Electi-city	Health	Housing
1) The Community Development Department	Yes	Yes	-	-	-	-
2) Department of Health	-	-	Yes	-	Yes	-
3) Department of Public Welfare	-	-	-	-	-	Yes
4) Office of Agricultural Land Reform	Yes	Yes	-	-	-	Yes
5) The Office of Accelarated Rural Development	Yes	Yes	-	-	-	-
6) Rural Roads Division	Yes	-	-	-	-	-
7) Provincial Water Works-Authority	-	-	Yes	-	-	-
8) Provincial Electricity-Authority	-	-	-	Yes	-	-
9) National Security Command-Headquarters	Yes	Yes	-	-	-	-
10) Rural Job Creation-Committee	Yes	Yes	-	-	-	-
11) The Bank for Agriculture and Agricultural Cooperatives	-	-	-	-	-	Yes

are Developed by the Community Development Department, the Office of Agricultural Land Reform, the Office of Accelerated Rural Development, the National Security Command Headquarters, and the Rural Job Creation Committee.

Specifically the Housing aspects, there already exists three action agencies, namely: the Department of Public Welfare, the Office of Agricultural Land Reform, and the Bank for Agriculture and Agricultural Cooperatives, therefore, it is prudent and practical for the NHA to seek ways and means, whereby, NHA avoids adding to the already heavily confused and overlapped situation, while contributing responsively to RHD needs and demands.

It should be noted that, even in the case of new settlement projects, such as land reform projects, self-help settlement projects, population relocation in various physical development projects, etc., the agencies responsible for the projects always carry out their own programmes of PDRS. In such cases the NHA may find it difficult to participate in PDRS if there are no jurisdictional and conditional clauses which indicates or stipulates that other agencies involved in PDRS projects, especially RHD components, must bring in the NHA and give the responsibilities for such RHD components, solely, to the NHA.

Also, the efforts in PDRS, at the community level, should be centrally and comprehensively planned and coordinated so that the community needs are appropriately dealt with in the most cost-effective and efficient ways. The comprehensive planning and management role is, at present, overlooked by the development agencies presently involved in PDRS. It is this role that is suggest as most appropriate and necessary for the NHA to contribute. However, in order to accomplish such a role an appropriate organizational structure at the national level must be set up to provide the opportunity for the NHA to implement this role. The major question is what should be the nature and scope of this central planning and management role of the NHA, with this further discussed in Chapter IV.

The development of rural houses is the most neglected area .....especially, in the context of dwindling traditional building materials, land use pressures, rising costs, and increasing populations. Therefore, the NHA could fully play its role in this area in integration

with its community development planning role. The same organizational structure for the central planning and management should be employed as a channel through which the NHA's actions in this area will be recognized.

The success of rural housing development will depend to a great extent on the following key factors; the stimulation of housing demand on a nation-wide scale, the availability of financial resource, and the successful transfer of technology. As earlier estimated, the future demand of, approximately, 200,000 houses per annum will probably be beyond the present coping capability of the NHA. Therefore, the NHA should fully cooperate with existant rural development agencies in order to pool the available resources and operate upon the concept of "devision of labour" in order to reduce the overhead and operational costs in rural housing development.

3.3 Development Pattern

In urban low-cost housing development, there are two common development patterns. In the first pattern, the NHA or private housing developers buy a piece of land, build houses and provide physical infrastructures. The houses are sold with the plot of land on a hire-purchase basis. The period of payment is normally 10-15 years with approximately 25% down payment. This development pattern results in new housing estates in the outskirts of Bangkok, Chiangmai and other major provincial urban centres.

In the second pattern, public and private financial institutions will give a loan to private individuals who will spend the money for building new houses or renovating existing houses.

In addition, to the above mentioned two development pattern, there is a new pattern referred to as "building together" which is the experimental design of the Asian Institute of Technology at one site in Bangkok. In this experiment, prospective house owners are selected from a number of applicants. They are required to pay only a nominal amount as down payment, but have to contribute their labour to help build their own new house. Their labour and efforts are accounted for and considered as a part of the required own-payment. The results of this experiment has not yet been evaluated, thus the conceptual applicability and acceptance cannot be clarified. However, from Chapter II, it is clear that the majority of the rural houses in all three regions have been built through

the contribution of labour by the house owners. Therefore, the opportunity cost of the labour and efforts of the prospective house owners will have to be fully evaluated too.

Housing development, whether in urban or rural areas, need similar kinds of tangible inputs; i.e., unskilled and skilled labour, equipment, tools, and materials. These inputs will have to be paid for, either, directly by cash or indirectly by opportunity cost and social expenses associated with free labour from self and neighbours as customarily practised in some rural areas.

Therefore, housing development actually needs good management for efficient utilization of money and inputs. Apparently, the three development patterns are different only in the management concept. In the first pattern, all works are managed by the developers. All that the prospective house owners have to do is to select or to bargain to get the best buy. In the second pattern, the prospective house owners have to manage all the works by themselves or through subcontracting. The "building together" pattern appears as a hybrid between the first and second patterns, with strong emphasis on creating a sense of participation and belonging and on skill development among the prospective house buyers.

However, if the acquired skills of the prospective house buyers can be capitalized upon.....by the local construction and related industries.....it is clear that the "building together" pattern offers more than just one house per participating family. What, exactly, is offered will become clearer only after evaluation results are clarified.

The basic question then arises as to what pattern should be adopted in RHD. Since rural families live on agriculture, thus the primary precondition is that they have to live near their farm-land, thus development, in the form of new villages, will be possible only in the case of resettlement projects.

Dispersed demand is another factor which will act against the mass development pattern. The second development pattern, in which a loan is made available, is the easiest pattern for implementation and is the most favoured by the interviewed family leaders, as shown in Table 3.2.

However, it will be difficult to orient and steer RHS towards the desirable environmental and socio-economic goals.

Table 3.2 : Attitudes Towards Housing Assistance from the Government.

Attitudes	Northern Region	Northeastern Region	Southern Region
No need for government assistance	48.5	34.4	47.3
Need for government assistance	51.5	65.6	52.7
Finished houses for sale	7.0	7.3	8.8
- cash purchase	(18.75)	(8.3)	(8.3)
- hire purchase	(81.25)	(91.7)	(9.7)
Financial loan	43.9	47.3	48
Equipment loan	22.8	14.0	7.8
Material loan	16.7	17.3	15.8
Technical training	8.8	11.3	9.8
Subsidized labour	0.9	2.7	9.8

Considering the practicability of the two development patterns coupled with experiences in RHD, it is suggested that a normal RHD pattern is adopted, where loans will be provided for housing purposes, but the loans will be in the form of materials rather than eash. In addition, the NHA, in cooperation with other development agencies will provide technical assistance. The construction management will be left to the house owners, because, due to the geopraphical dispersion of demand, it will not be economical for the agencies to undertake such management work.

3.4 Subsidy

The issue of subsidy in rural housing is of course, a controversial and debatable subject. To our knowledge, all rural development

projects are subsidized to a great extent, especially projects designed to serve community needs. For projects concerning individual needs, subsidy is also provided to create demand incentives. A typical example is biogas promotion, in which a gas container is provided at no cost to farmers who would invest in building the digester. This subsidy is as high as one third of the total cost.

It is clear that the question of subsidy or no-subsidy in rural housing can become strongly politically oriented. This stems from the realization that the subsidized low-cost housing, within the major urbanized areas, resulted from the imports substitution policy of the government. Such a policy opened up employment opportunities within the construction industry and the industries built to produce imports substituting products.....which resulted in an over-migration of employment seekers into the urban communities where opportunities were clearly felt.

However, because the migrations were not controlled nor managed it resulted in the creation of squatter and other over-crowded settlements which soon deteriorated into slums and "face losing" thorns requiring mitigation, through what resulted in subsidized low-cost housing projects leading to the creation of the NHA.

Thus, the crux of the subsidy, in rural housing, will begin with a major government policy and objective which is designed to attract, retain and reward rural populations who choose to remain within their birthplaces, to continue to remain agriculturally productive (increasing that productivity through government assistance) and to develop industries which will increase rural incomes and the value of rural produce, etc.

However, another key-point following after government policy and objective will be the optimum level of subsidy. If the subsidy is too high it will create unnecessary demand and reduce the number of beneficiaries because the budget is limited, therefore, resources will not be efficiently utilized. On the other hand, if the subsidy is too low the demand will not be stimulated and the question of social equity can then be raised when compared with subsidy for urban housing. In addition, only the better-off families will be able to benefit from the project, since they have more risk-absorbing capacity.

Admittedly, it will be extremely difficult in practice, to determine the optimum level of subsidy for rural housing. In theory, determination of the optimum subsidy level will require benefit-cost analysis of various subsidy levels. The difficulty would lie in the determination of social and economic benefits and costs and the dynamic nature of the optimum subsidy level, thus, the optimum subsidy level may exist only in theory.

It is suggested that a subsidy programme should be designed in which the lower income group will benefit more than the higher income group. This preferential treatment may appear in the form of different interest rates and different prices of materials for various income groups. Ofcourse, a more comprehensive procedure and associated measures will have to be worked out in the detailed planning stage.

3.5 Building Materials and Technology.

The success in employing RHD as an instrument for rural socio-economic development, will depend to a great extent on the proper selection of building materials. Ideally, the building materials selected for rural housing development should meet the following criteria:

(a) Low cost;
(b) Labour intensive in production;
(c) Locally available, and
(d) Able to significantly replace wood.

From the results of analysis in Chapter II, it is believed that the key to success is the creation of rural building material industries. This means rural housing development will create demand for building materials which will be supplied by small rural industries. Table 3.3 presents the various alternative materials for different house components. Brick is not considered because its production is energy intensive.

At present, soil-cement block (SCB) is the most qualified candidate, since it has been developed to a workable stage and its production can be industrialized (see technical details of SCB in Appendis 3.1.) However, there is no intention to exclude other new building materials which may be developed in the future, nor the intention to employ only SCB.

Infact, it is envisaged that a rural house built from a mix of local materials, for instance SCB walls, bamboo windows and doors and grass roof will be practical, acceptable and economical. Thus, at this stage, it is proposed that SCB would be a good point for initiation.

However, SCB still has a number of weaknesses in competing with wood. Normally, in a wooden house the floor will use most of the wood, roughly from 20% to 30% of the total wood volume. Therefore, if SCB cannot replace a wooden floor the amount of wood saving will not be substantial. This points out that SCB houses have to be one storey and resting on ground. It will be technically difficult to apply SCB in one-storey, elevated houses. For two storey houses, SCB is in a more favourable position to compete with wood.

Table 3.3 : Alternative Materials for Building Rural Houses.

House Components	Coneret	Wood	SCB	Bamboo	Gal. Steel	Thatch
Super-Structure	A	A	-	A	-	-
Supporting-Structure	A	A	A	-	-	-
Floor -Upper	A	A	-	A	-	-
Floor -Ground	A	A	A	-	-	-
Wall	A	A	A	A	-	-
Roof	-	-	-	-	A	A
Door	-	A	-	A	A	-
Window	-	A	-	-	A	A

It is unfortunate that one storey, rested-on-ground houses are not so popular in the northern and northeastern regions, but are more acceptable in the south as shown in Table 3.4. Two storey houses are, however, the favourite in all 3 regions, especially in the northeastern region. This data indicates that the major market for SCB at present, is two storey houses which are mostly affordable by better-off rural families.

Another drawback with SCB is that there must be appropriate lateritic soil within reasonable distance from the production site. In this study, soil samples from various study villages were collected for laboratory evaluation of their suitability for making SCB. The results summarized in Table 3.5 are not encouraging. However, this survey was very rudimentary and it is hoped that more suitable lateritic soil sources can be found if new detailed soil surveys are conducted.

The last comment on the drawback with SCB is that at, present, only few designs of SCB are available. More designs of SCB will have to be developed to diversify the application of SCB, thus enhancing its competitive position against wood.

Table 3.4 : Housing Preference Based on Design.

Type of House	Region		
	Northern	Northeastern	Southern
One storey house, rested on ground	5.0	2.0	31.6
One storey house, lowly elevated	10.6	3.0	7.9
One storey house, highly elevated	48.4	34.6	27.6
Two storey house	35.9	60.4	32.9

In spite of its weaknesses, SCB can compete with normal cement block. To justify this assertion, a comparative analysis of SCB cement block and wood for two typical designs of houses was conducted as presented in Appendix 3.3 and the results are summarized in Table 3.6. Clearly, for the two designs of houses, SCB is more economically attractive. However, the most interesting point is that the utilization of SCB will result in more

Table 3.5 : Test Results of Soil Samples Collected from the Three Regions Showing Confirmed Suitability for SCB Production.

Region and Source Location	Soil Type
NORTHERN	
Chiang Mai; A.San Kamphaeng; T.Huaytrai	Laterite
Phayao; A.Chun; T.Lau	Sand
NORTHEASTERN	
Nakhon Ratchasima; A.Sung Noen;	Sand
A.Sikhiu; T.Lat-Bua Kaa	Laterite
A.Muang; T.Khok Kuad	Laterite
Roi Et; A.Phon Thong, T.Non Thai Si (Km.20)	Laterite
A.Selaphum, T.Tha Sa Baeng (Km.29)	Laterite
A.Kaset Wisai, T.Sing Khok	Silty Sand
Nong Khai; A.Si Chiang Mai; T.Nong Pa-Pat	Laterite
Surin; Tha Tum-Rattanaburi Road, Km.18-19	Laterite
Tha Tum-Surin Road	
Ubon Ratchathani;	Laterite
SOUTHERN	
Pattani; A.Khog Pho; T.Pahbon	Sand

Note : See Appendix 3.2 for detailed data.

Table 3.6 : Comparison of Building Materials.

Type of Houses	SCB	(CONCRETE) Block	Wood
One storey, tested on ground			
Floor space, m^2	15.84	15.84	15.84
Floor material	SOIL CEMENT/ BAMBOO REINF.	CONCRETE SLAB ON GROUND	WOOD
Walls material	SCB	CONCRETE BLOCK	WOOD
Cement consumption (Bag)	26	22	3
- baht	1,872.-	1,584.-	216.-
Steel consumption (kg)	50.49	50.49	25
- baht	455.-	455.-	225.-
Wood consumption (Cuf)	30.32	30.32	83.5
- baht	5,458.-	5,458.-	15,030.-
Labours, man-days			
- house building	45	43	43
- production of materials	36	-	-
Total cost, baht	11,847.-	13,055.-	19,927.-
Two storey house			
First floor, space, m^2	41.17	-	41.17
- material	SOIL CEMENT/ BAMBOO REINF	-	CONCRETE SLAB ON GROUND
- wall material	SCB	-	WOOD
Second floor, space, m^2	24.75	-	24.75
- material	WOOD	-	WOOD
- wall material	SCB	-	WOOD
Cement consumption (Bag)	56	-	40
- baht	4,010.-	-	2,880.-
Steel consumption (kg)	172	-	333
- baht	1,548.-	-	2,997.-
Wood consumption (Cuf)	130	-	244
- baht	23,400.-	-	43,920.-
Labours, man-days			
- house building	92	-	71
- production of material	75	--	-
Total cost, baht	36,582.-	-	49,122.-

Note : (1) Labour cost for SCB production is based on 40.-baht/day

(2) The average production rate of SCB is 45 pieces/man-day.

employment and more maney directly paid to the rural people. The diagram in Figure 3.1 shows that the application of SCB will reduce the money outflow from the rural to urban area by 10,128 baht per house for the one-storey rested on ground type house, and by 16,249 baht per house for the two storey type house.

For employment, opportunity SCB production will create 36 man-days per one-storey house and 75 man-days per the two storey house. Consequently, the social and economic benefits of SCB can be clearly seen. If SCB is used in all the estimated total demand of 200,000 houses, at least 10,000 people can be employed, based on 300 working days per year. The amount of cash flow in the rural area can be as high as 3,000 million baht per annum. This amount of cash flow will certainly stimulate growth of other industries.

3.6 Financial Aspect

Undoubtedly, need can be converted into demand only through increasing the ability and the willingness to pay. The ability to pay can only be increased through providing low-interest loan for housing purposes. Figure 3.3 shows frequency distribution of families according to their amount of annual saving. It can be inferred that 50% of the families in the northern, the northeastern, and the southern regions have annual saving less than 3,000 baht, 2,600 baht, and 2,500 baht, respectively.

From these figures of annual saving the ability to pay can be estimated as shown in Table 3.7 assuming a repayment period of 15 years. It is clear that our estimation is based on very low interest rates which will not be possible through normal financial loan from commercial banks. We stroughly insist that the interest rate should not be higher than 8%. This means the financial loan must be sought from some international financial institutions which normally charge a low interest rate. If this source of finance is not possible, the difference between the actual interest rate and the charged interest rate must be treated as a government subsidy.

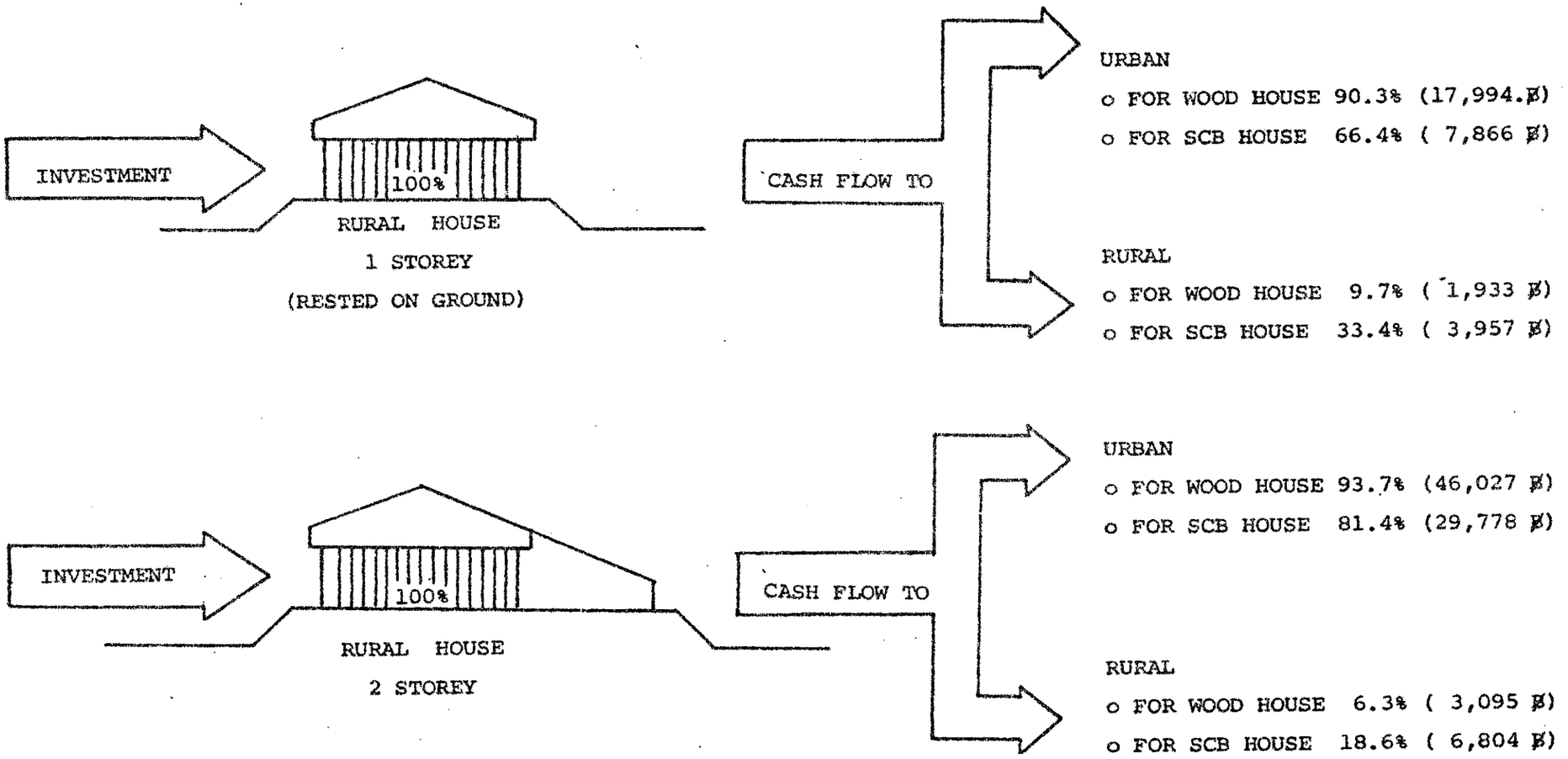


Figure 3.1 : Cash Flow Comparisons Between Two House Types Built from SCB and Other Materials.

Table 3.7 : Payment Ability for Housing of Average Families

Annual Interest Rate,%	Regional Average Payment Ability		
	Northern	Northeastern	Southern
3%	36,195	24,128	30,159
5%	31,611	21,074	26,342
8%	26,342	17,438	21,797

The figures in Table 3.7 indicate that if low interest rate loan with long repayment period can be provided the majority of families can afford building a modest house line the ones described in section 3.5. The figures can also be used in fixing an appropriate, amount of loan for each region.

At present there is no bank loan specifically for rural housing purposes, except in some few cases of resettlement projects. The Agriculture and Cooperative Bank gives loan for construction of agricultural buildings and physical facilities. In 1575, this category of loan was 471 million baht with an annual interest rate of 12% and a repayment period of 3-5 years. Some of the loan, would have been spent in house improvement. It is then clear that the NHA will have to pursuade government and commercial banks to provide credits for rural housing. The most difficult problem is the guarantee of the loan. This financial source may therefore, not be possible.

We would like to suggest that the concept of housing cooperative should be fully exploved. However, the local financial input will not be sufficient for starting RHD. Therefore, the NHA will have to provide soft loan to the cooperatives. The loan provided in terms of materials, should be guaranteed by a group of cooperative members as normally practiced in providing the loan for agricultural production purposes.

The manitude of financing programme can be roughly worked out assuming that a loan of materials equivalent to 10,000 baht will be provided.

If only 5% of the estimated total demand of 200,000 houses are the target, the annual finance required will amount to 100 million baht. These figures show clearly that the NHA will have to look for external sources of finance. We really doubt if RHD will be able to compete with other rural development needs for the government budget, at least during its initial stage of inception.

3.7 Development Strategies

In implementing a RHD programme, we propose the following strategies;

3.7.1 Demand Creation and Concentration

The estimated total demand of 200,000 houses per year may seem very large. However, the demand on the average is only 5 houses per village. This demand concentration is too low to support rural building materials industry, and will result in excessively high overhead cost of the RHD agencies. Therefore, more demand will have to be created to increase the demand concentration. In practice, this means careful selection of target villages and efforts are made to increase the demand in the target villages.

3.7.2 Demand Orientation

The success of RHD in inducing rural development will depend to a great extent on how the demand can be oriented towards the desirable pattern i.e. houses built mainly from appropriate non-wood materials. This orientation is clearly governed by the willingness to pay. The analysis in Section 3.5 clearly indicates that the demand will have to be oriented towards SCB. The willingness to accept SCB is governed to a great extent by old housing tradition in which wood is the most preferable material. In addition, the use of soil as building material always carries the sense of cheapness, thus giving low social prestige. Therefore, the demand orientation will have to employ the following strategies in combination;

(a) Enforce use of SCB as a condition of housing loan;

(b) Demonstrate SCB houses;

(c) Create a better image for SCB for example, giving SCB a new name with no word "soil"

3.7.3 Develop Production Base for SCB

SCB is always viewed as innovative technology for rural development. In the past, a typical approach was to promote SCB production in families for their own use. We strongly disagree with this approach. It is not practical and economic for each family to produce a small number of SCB for its own need. We propose that a small-scale commercial production of SCB must be promoted to ensure the steady and economic supply of SCB. Without this production base, promotion of SCB houses will doom to fail.

3.7.4 Promote SCB

To gain acceptance in rural housing and to develop production base for SCB, SCB must be introduced into rural areas through its application in building rural facilities such as schools, health centres, offices, etc. Therefore, NHA will have to receive cooperation from other development agencies in the promotion of SCB. The NHA in collaburation with TISTR should provide technical assistance in organizing local production of SCB to meet the demand, Hopefully, this production base will remain and serve RHD.

CHAPTER IV

ORGANIZATIONAL AND ADMINISTRATIVE ASPECTS

In this chapter, we analyse the organizational and administrative aspects of PDRS, in which RHD is one important element, is analysed. A practical organizational and administrative structure, which will enable the NHA to effectively and efficiently play its key roles in PDRS, is the synthesized output.

4.1 Conceptual Framework

The organizational and administrative aspects of PDRS can be considered at two levels; the national and the institutional levels.

At the national level, there are two key questions;

(1) What is the existing organizational and administrative structure at national level and will it provide the NHA with an opportunity to implement its policy and plans effectively and efficiently?

(2) If the existing national PDRS (organizational and administrative) structure is not appropriate for the NHA, what should be done to anable the NHA to implement its policy?

At the institutional level, the crux of the issue is whether or not the NHA will be able to allocate adequate and appropriate resources for policy implementation within the existing organizational framework?. Therefore, it is necessary to identify and quantify the resources need and the functional structure of the PDRS. These ofcourse, will have to be in line with a detailed operational plan to be prepared in the next stage.

4.2 National Level

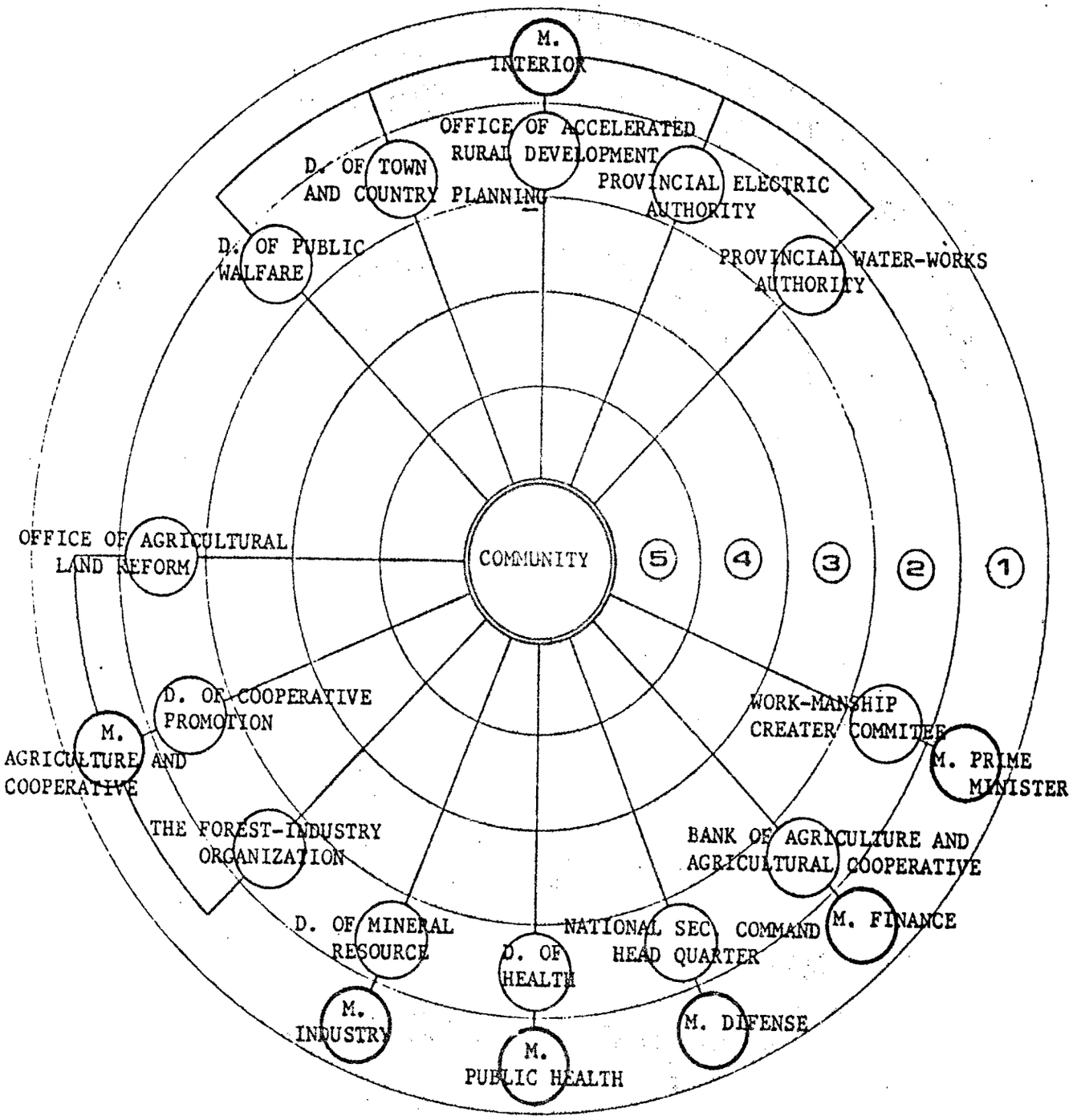
It was earlier suggested that the NHA should play 2 key roles in PDRS. The first role is the planning and management role in which the NHA, through a practical mechanism, functions as the central planning and management agency for PDRS, and also as the coordinating agency to ensure cost-effective and efficient improvement of the physical living conditions in rural areas.

The second NHA role is in RHD, in which the NHA takes actions to improve rural housing conditions. Since many agencies are concurrently entrusted with the responsibility for rural development and have long been involved in the various aspects of PDRS, as the new comer the roles of the NHA, especially the planning management and coordination roles; may not be welcomed and recognized. The capability of the NHA will, undoubtedly, be challenged since the NHA with be considered inexperienced in rural development. The NHA may also be considered, by most development agencies, as the intruder into their, hitherto, undisputed domains.

The direct and honest opinion expressed above may appear to be very pessimistic. However, pessimism is beside the point, because the most important point is the need for integrated planning and coordination in PDRS for the rural sector and national benefit. The top priority will be for the NHA's top management to confirm if the NHA should and can meet the challenges presented by PDRS and RHD. In this study, it is assumed that the NHA will decide to undertake this challenging role.

From Figure 4.1 it is apparent that nearly all PDRS activities are carried out by various agencies under the Ministry of Interior (MOIT), especially, the ARD and the DCD. Since the NHA is also under the MOIT, cooperation and coordination between development agencies within the same ministry should not be difficult to achieve. However, because PDRS is also carried out by other agencies under the Ministry of Agriculture and Cooperatives (MOAC), as integral components of their agricultural development projects, cooperation with the MOAC is essential

Again it must be emphasized that, the need for coordinating and integrating PDRS activities carried out by the various departmental agencies of the government. This is clearly indicated by the reality that, although there exists the Committee on Human Settlements (CHS), appointed by the National Environment Board, it is basically oriented towards broad policies and concepts concerning the human ecosystem.....however, it is not and there does not exist a coordinating and integrating body with overall planning, management and implementing authority with legal powers over PDRS activities and agencies.



1 = Ministry Level
2 = Department Level
3 = Province Level
4 = Amphoe Level
5 = Tambon Level

Figure 4.1 : Diagram of Government Agencies Concerned with PDRS

This becomes clear when it is understood that the CHS'role is confined to practical research and study, rather than real actions in rural areas.....and has the Office of the National Environmental Board(NEB) acting only as the Secretariat. Thus, depending upon the NHA's decisions in role playing, it is clear that the CHS will still remain an appropriate channel through which the NHA can reinforce its role(s).

At present, there exists a national organizational structure and system for rural development as diagramatically shown in Figure 4.2. It can be seen that in this organizational structure the National Economic and Social Development Board (NESDB) provides the broad socio-economic development framework and the National Committee on Rural Development (NCRD) provides the rural development framework at provincial level. While the Rural Job Creation Committee (RJCC) deals with rural development at project level, mainly for the creation of temporary employment during the dry season.

It is clear that PDRS, especially RHD as one integral component of rural development, will have to be under the umbrella of the NCRD. At present, the NCRD has 5 sub-committees as shown in Figure 4.3. We suggest that a new sub-committee should be established to carry out PDRS. The sub-committee may be named as "The Sub-Committee on Rural Settlement" (SCRS) of which the NHA governor may be the chairman. The SCRS will have the prime responsibilities for formulating policy on PDRS particulary RHD, and for integrating and coordinating all PDRS activities. We suggest the structure for the SCRS as shown in Figure 4.4. The sub-committee members are from various agencies involved in one way or another with PDRS. Linkage between the SCRS and NCRD is similar to that of the other sub-committees.

If the SCRS's policy guidelines and plans are to be recognized and implemented, it must be vested with appropriate authority. We should make it clear at this stage that the "authority" herein means the authority at policy level. In practice, the SCRS will issue policy guidelines concerning PDRS for various development agencies. Budget will be allocated to only projects which fall in line with the policy framework. This means the SCRS will have the authority to endorse PDRS plans sub-mitted by various development agencies.

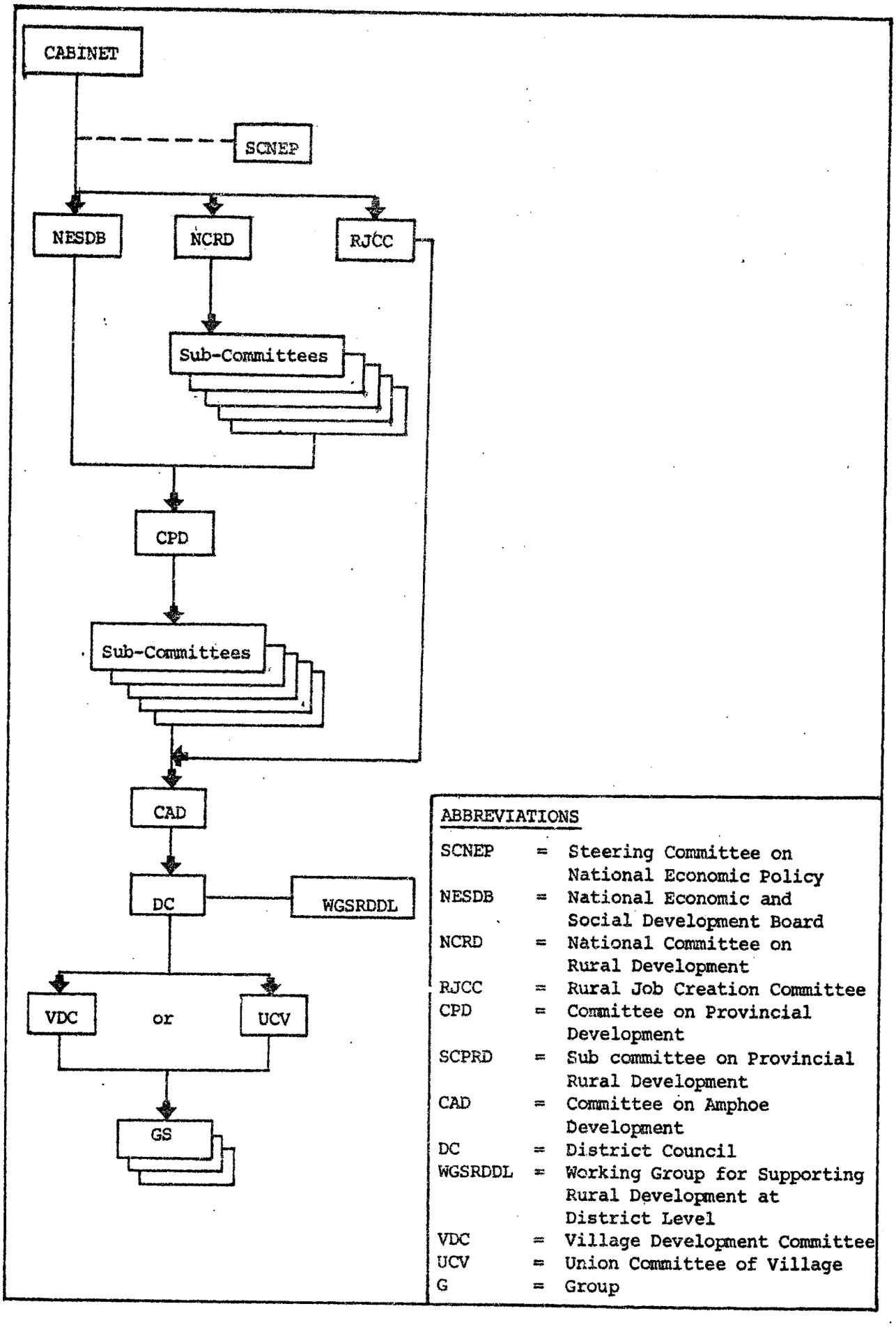


Figure 4.2 : Organizational Structure for Rural Development Administration.

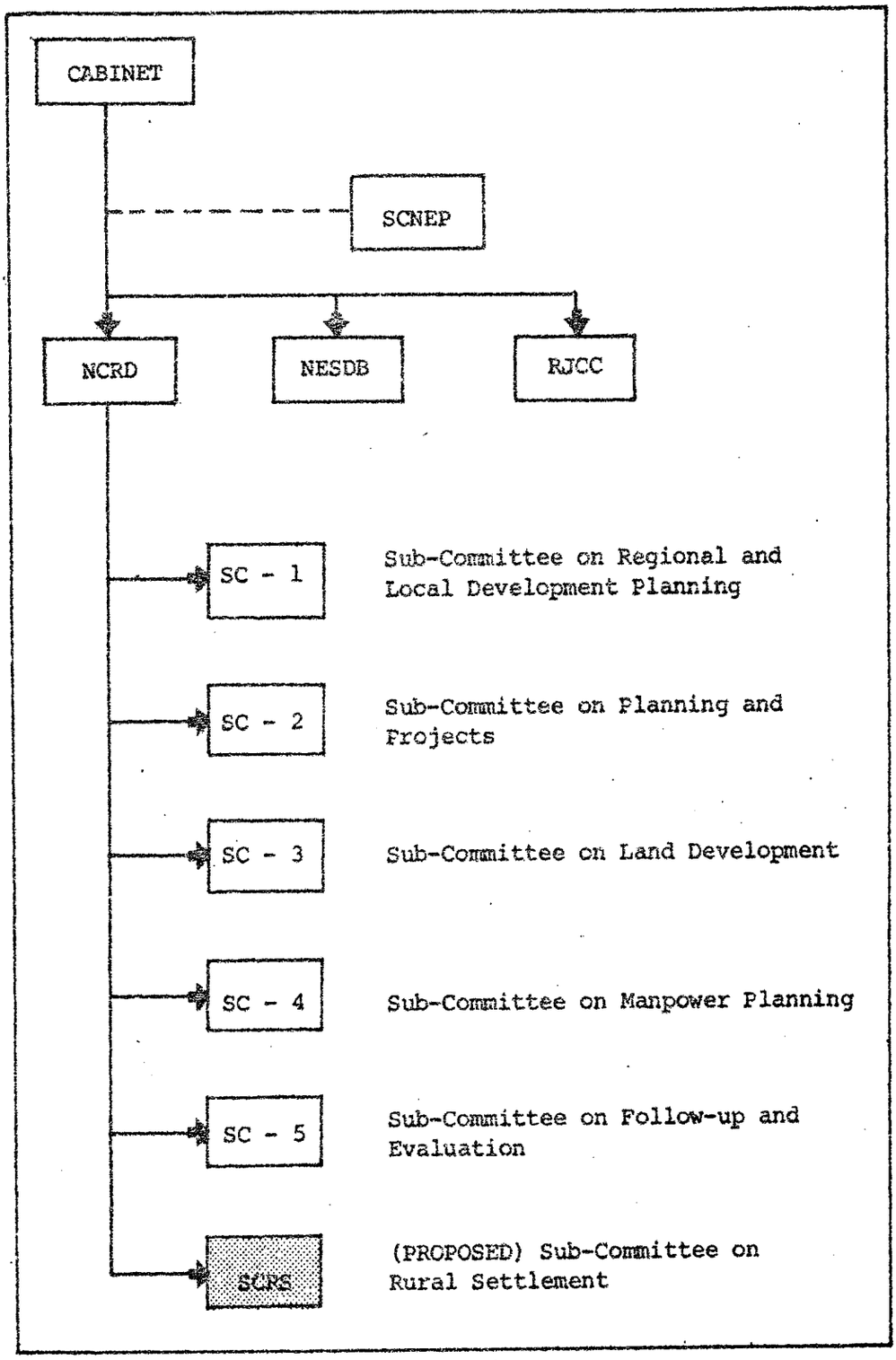


Figure 4.3 : Proposed Location of SCRS as a Sub-Committee Under NCRD.

Figure 4.4 : Composition of SCRS.

SCRS chairman	- NHA Governer
Vice-Chairman	- Deputy General Director of Community Development Dept
Committee member	- Deputy Secretary General Office of Agricultural Land Reform
" "	- Deputy Secretary Grneral Office of Accelerate Rural Development
" "	- *Deputy General Manager of Provincial Water Works Authority
" "	- *Deputy General Manager of Provincial Electricity Authority
" "	- *Deputy General Director of Dept of Acalth
" "	- *Deputy General Director of Dept of Public Welfare
" "	- *Deputy General Manager of Bank Agriculture and Agriculture Cooperatives
" "	- Representative of Education Ministry
" "	- Representative of Communication Ministry
" "	- Representative of National Security Commond Acadquaters
" "	- Representative of NESDB
" "	- Representative of Bureau of The Budget
" "	- Representative of Office of The Civil Service Commission
" "	- Representative of Dept of Mineral Resources
" "	- Director of Policy and Planning MOIT
" "	- Director of Rural Road Division, Dept of Public Works
Committee Member and Secretary	- Director of OPDRS

* - or representative

4.3 Institutional Level

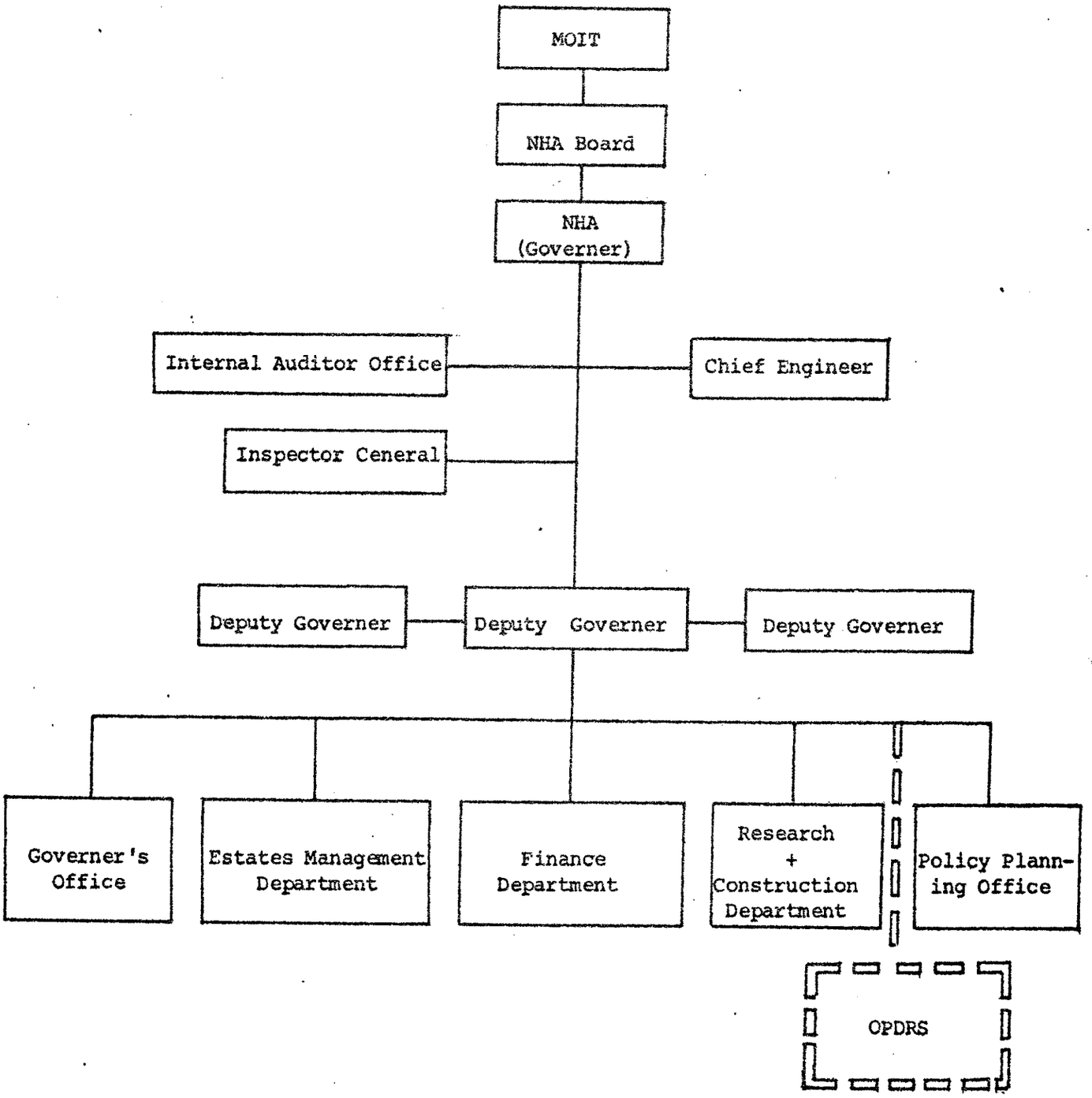
At the lime of preparing this report, the organizational structure of the NHA shown in Figure 4.5 is heavily oriented towards urban settlement development. To embark upon the new responsibility in PDRS, we propose that a new special working unit should be set up. This new unit may be named as "Office of the Physical Development of Rural Settlement (OPDRS)" It must basically be a multidisciplinary group consisting of rural sociologists, economists, engineers, and architects with high calibre in planning and management. The OPDRS will be in practice, work-horse for the SCRS.

Figure 4.6 shows a functional chart for the OPDRS which covers 5 functions as follows; policy and planning integrated design, project development and management, and managerial and administrative services. Each functional unit should have responsibilities as follows;

(1) Policy and Planning This function's main outputs are policy guidelines for PDRS at both the macro and the micro levels, and master plans for PDRS. These outputs are prepared mainly for the NCPDRS. In addition, this functional unit will also serve as policy adviser to the SCRS in general and the NHA in particular, in policy issues concerning PDRS. Therefore, this functional unit must be staffed by high calibre sociologists, engineers, architects, and economists, whose special interests and expertise are in rural development. They will be engaged in study and survey, and project evaluation to establish a scientific and systematic information base for policy formulation and planning.

(2) Integrated Design This function's main output is integrated software and hardware disigns for PDRS especially for housing development. This means not only the blue prints but also an operational plan involving social strategies and tactics. In addition, it will be responsible for training and technology transfer. Therefore, this functional unit needs a multidisciplinary team of similar structure to that of the policy and planning unit.

(3) Project Development and Management This functional unit is to translate approved policies and plans into projects. This means the unit has to evalnate and appraise project concepts, and develop project



OPDRS = Office of The Physical Development of Rural Settlement.

Figure 4.5 : Organizational Structure of NHA.

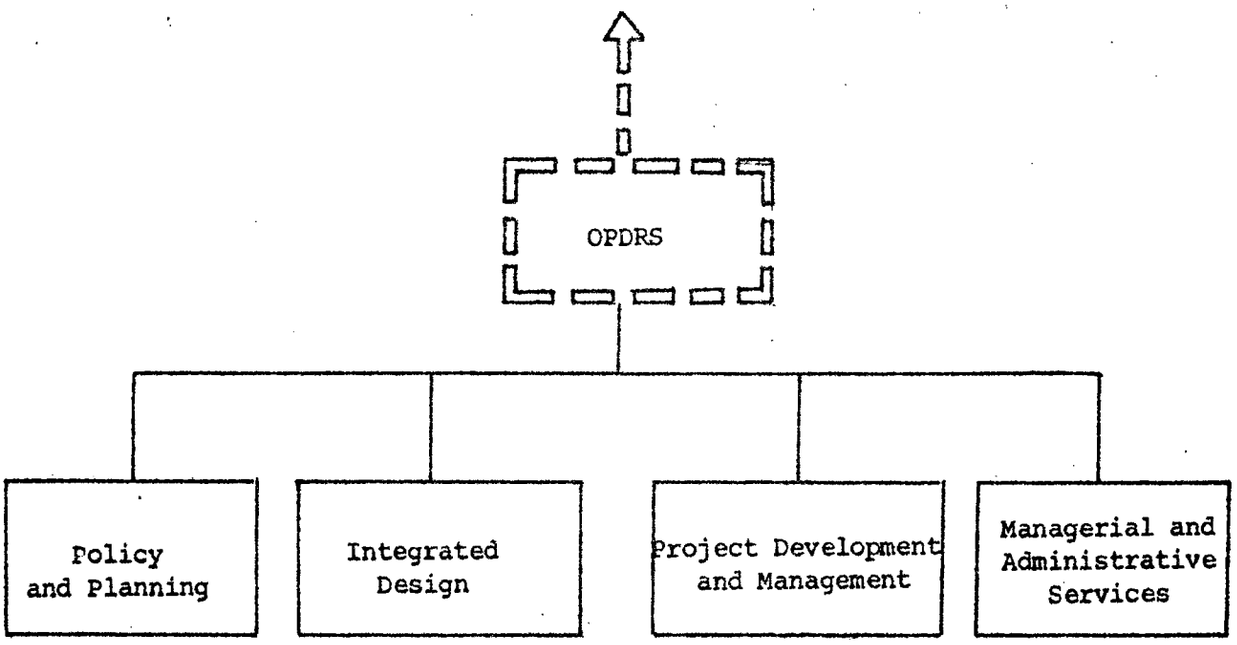


Figure 4.6 : Funtional Chart for OPDRS

proposal and plans, ready for consideration by high-level management in the NHA, the SCRS and external funding agencies. It also has to manage the project during its implementation stage. This functional unit also needs a multidisciplinary team with analytical and management capabilities.

(4) Managerial and Administrative Services As the name implies this functional unit will provide managerial and administrative supports to the other 3 functional units. It will also oversee all administrative arrangements needed for the periodic SCRS meeting.

At the beginning, the OPDRS may start off as a small entily under the existing Research and Construction Department. The OPDRS will gradually grow with the work load and eventually, will be separated from the Reserach and Construction Department to become are new department of the NHA. We will not make more comment on the organizational status of the OPDRS since it depends to a great extent on the NHA's internal policy. All we can strongly recommend is the OPDRS is multidisciplinary; strong in planning management, and design capabilities; and self-contained in terms of human-resources. The staff number and structure will have to be determined after the operational plan is prepared and approved.

Appendix 1.1

The Field Survey

1. Objectives of the Survey.

The field survey has the following objectives;

(1) To collect socio-economic data relevant to housing need and demand;

(2) To assess physical condition and constraint of rural housing;

(3) To assess local need of community and housing development;

Therefore, the field survey aims to strengthen the data base primarily formed from secondary data.

2. Selection of the Village Samples.

Due to the time and budget constraint, the survey has to limit itself to a small number of villages in the northern, the northeastern, and the southern regions. The village samples are selected in steps as follows;

(1) Select representative provinces in each region;

(2) Select representative districts from representative provinces;

(3) Select representative sub-districts and villages from representative districts;

(4) Select family samples in each village sample.

Each selection step is conducted as follows;

2.1 Selection of Representative Provinces

In the selection of representative provinces, two criterias are considered, economic and population.

For the economic criteria, the following indexes are used;

Y_1 = average gross provincial agromonic product per unit area, baht/rai,

Y_2 = average gross provincial agricultural product per rural people, baht/head,

Y_3 = average annual growth rate of the agricultural product, over the past 5 years.

For the population criteria, the following indexes are used;

X_1 = average density of rural population, persons/km^2

X_2 = average annual rate of rural population growth over the past 5 years.

The economic and social criteria for each province in the same region are compared and graded from 1 to 10 according to their order of magnitudes. The total grade of the economic criteria is then plotted against the total grade of the social criteria. Approximately, for each region, 30% of the provinces are selected as representative provincial samples. Tables A-1, A-2, and A-3 and Figure A-1, A-2, A-3 show the described method of selection. The results are as follows;

Northern Region :	Chiang Mai, Phayao, Petchabun and Uthai Thani.
Northeastern Region:	Nakhon Ratchasima, Surin, Roi Et, Ubon-Ratchathani, and Nong Khai.
Southern Region :	Chumphon, Krabi, Songkhla and Pattani.

2.2 Selection of Representative Districts.

In the selection of representative districts, only 2 to 3 districts are selected for each representative province. Since the economic data at district level are scarce the representative districts are selected mainly from the population criteria, In addition, such criteria as travel convenience, political securtly, and existence of government organized settlements are also considered in the selection, the results are inclusively presented in Table A-4.

Table A-1 : Selection of Provinces (Northern Region)

Northern Region	Average gross provincial product per unit area (baht/rai)		Average gross provincial agricultural product per rural people (baht/head)		Average gross rate of the agricultural product over the past 5 years		Average density of rural population (person/km^2)		Average annual rate of rural population growth over the past 5 years		Economic Criteria	Population Criteria	Communities	Sensitive area
	Value (Y_1)	Grade	Value(Y_2)	Grade	Value(Y_3)	Grade	Density	Growth -rate	Donsity	Growth -rate	Grade	Grade		
1. Chiang Rai	657.88	2	1,860.33	5	-8.66	1	74.6	9	-5.92	1	8	10		
2. Phayao	469.37	1	1,191.92	1	-	-	58.3	7	-	-	2	7		
3. Mae Hong Son	1,400.14	7	2,445.16	10	28.52	6	9.1	1	4.93	10	23	11		
4. Chiang Mai	1,848.76	10	2,372.92	9	22.31	5	44.9	5	1.42	4	24	9	2	
5. Nan	1,610.30	9	2,549.96	10	48.97	9	29.8	3	2.10	5	28	8		
6. Lamphun	1,712.14	10	2,221.47	9	0.69	2	74.1	9	0.89	3	21	12	2	
7. Lampang	792.18	3	1,449.89	2	-10.49	1	48.9	6	0.56	3	6	9	7	
8. Phrae	1,097.99	5	1,485.65	3	-23.82	1	64.9	8	1.41	4	9	12	3	
9. Uttaradit	557.64	2	1,663.06	4	7.53	3	50.0	6	1.88	5	9	11	1	
10. Sukhothai	458.71	1	2,420.28	10	8.77	3	76.4	10	1.30	4	14	14	2	
11. Tak	657.46	2	1,766.31	5	29.41	6	13.0	1	2.37	6	13	7	1	
12. Phitsanulok	353.07	1	1,544.03	3	53.93	10	64.0	8	1.80	5	14	13	1	
13. Kamphaeng Phet	458.79	1	2,181.60	8	23.70	5	50.0	6	2.41	6	14	12		
14. Phichit	425.60	1	2,214.05	8	59.23	10	112.7	10	0.70	3	19	13		
15. Phetchabun	397.95	1	1,948.76	6	-7.52	1	56.8	7	3.06	7	8	14		
16. Nakhon Sawan	448.18	1	2,123.23	7	4.85	3	83.0	10	-0.51	1	11	11	1	
17. Uthai thani	508.01	1	2,363.99	9	50.44	9	33.9	4	4.04	9	19	13		

Table A-2 : Selection of Provinces (Northeastern Region)

Northeastern Region	Average gross provincial product per unit area (baht/rai)		Average gross provincial agricultural product per rural people (baht/head)		Average growth-rate of the agricultural product over the past 5 years		Average density of rural population (person/km^2)		Average annual rate of rural population growth over the past 5 years		Economic Criteria	Population Criteria	Communities	Sensitive area
	Value(Y_1)	Grade	Value(Y_2)	Grade	Value(Y_3)	Grade	Density	Growth-rate	Density	Growth-rate	Grade	Grade		
1. Loei	312.86	6	1,383.24	10	-9.77	1	38.0	1	2.67	10	17	11		
2. Udon Thani	239.71	3	966.17	3	17.07	7	79.0	2	2.27	8	13	10	1	x
3. Nong Khai	391.60	10	1,451.00	10	27.75	10	84.0	3	2.76	10	30	13	1	x
4. Sakon Nakhon	203.80	2	930.76	3	-41.78	2	76.0	2	2.63	10	7	12		x
5. Nakhon Phanom	267.49	4	815.25	1	-25.04	1	71.0	1	1.80	5	6	6		x
6. Si Sa Ket	233.97	3	835.25	1	16.22	7	114.9	8	2.58	9	11	17	1	
7. Surin	251.30	4	994.76	4	14.68	7	107.7	7	1.61	3	15	10	1	
8. Roi Et	262.11	4	1,005.91	4	-8.78	1	130.3	10	1.39	2	5	12		
9. Kalasin	412.80	10	1,311.55	8	10.86	6	92.2	4	1.58	3	24	7	1	
10. Maha Sarakham	243.73	3	956.70	3	6.02	5	122.8	9	1.74	4	11	13		
11. Khon Kaen	252.19	4	1,030.73	4	7.66	5	104.8	6	1.15	1	13	8		x
12. Chaiyaphum	259.70	4	1,254.40	7	10.85	6	75.1	1	2.67	10	17	11		
13. Nakhon Ratchasima	315.44	6	1,429.50	10	30.54	10	101.9	6	2.76	10	26	16	1	
14. Buriram	386.89	9	1,391.95	10	12.26	6	101.2	6	1.97	6	25	12	1	
15. Ubon Ratchathani	176.79	1	796.54	1	-8.81	1	77.9	2	2.50	9	3	11	1	
16. Yasothon	299.15	6	1,247.78	7	8.97	5	103.1	6	1.80	5	18	11		

Table A-3 : Selection of Provinces (Southern Region)

Southern Region	Average gross provincial product per unit area (baht/rai)		Average gross provincial agricultural product per rural people (baht/head)		Average growth rate of the agricultural product over the past 5 years		Average density of rural population (person/km^2)		Average rural rate of rural population growth over the past 5 years		Economic Criteria	Population Criteria	Communities	Sensitive area
	Value(Y_1)	Grade	Value(Y_2)	Grade	Value(Y_3)	Grade	Density	Growth-rate	Density	Growth-rate	Grade	Grade		
1. Krabi	418.67	1	2,904.31	5	32.97	5	41.5	2	4.25	10	11	12	3	
2. Chumphon	687.13	4	3,355.64	7	75.82	10	48.0	2	2.85	6	21	8	1	
3. Trang	394.03	1	2,932.02	6	15.58	3	66.1	3	1.82	3	10	6	1	
4. Nakhon-Si-Thammarat	398.42	1	1,493.08	1	71.96	10	110.0	6	0.96	1	12	7		x
5. Narathiwat	1,188.61	10	2,582.05	4	4.39	1	88.4	5	2.37	4	15	9		x
6. Pattani	631.22	3	1,750.65	2	69.33	10	185.2	10	2.13	4	15	14		x
7. Phangnga	631.00	3	4,414.07	10	2.03	1	99.8	5	2.05	4	14	9		x
8. Phatthalung	390.28	1	1,443.46	1	7.59	2	37.6	2	2.92	6	4	8		
9. Phuket	525.91	2	2,442.23	4	38.32	6	157.1	9	4.26	10	12	19		
10. Yala	598.31	3	2,426.01	4	28.09	4	42.0	2	4.39	10	11	12		x
11. Ranong	822.08	6	8,975.08	10	20.22	3	20.0	1	3.43	8	19	9	1	x
12. Songkhla	393.59	1	2,479.22	4	16.98	3	88.0	4	1.63	2	8	6		
13. Satun	551.95	2	3,167.59	6	18.85	3	53.6	3	4.12	10	11	13		x
14. Surattani	952.95	8	2,880.51	5	18.66	3	40.6	2	1.81	3	6	5	3	

Figure A-1 : The Distributive Relationship Between Population Size and Economic Status of Sample Provinces in the Northern Region.

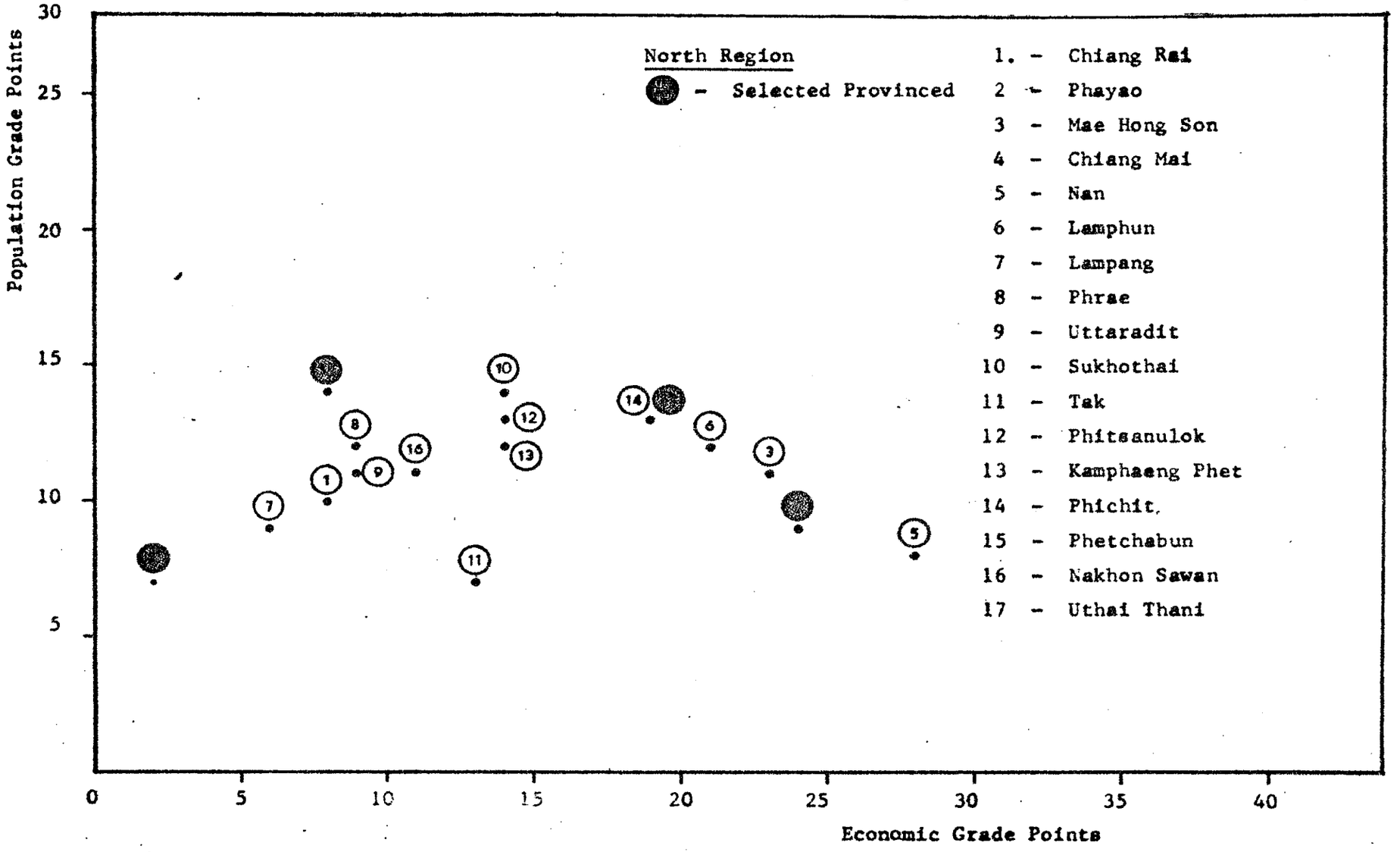


Figure A-2 : The Distributive Relationship Between Population Size and Economic Status of Sample Provinces in the Northeastern Region.

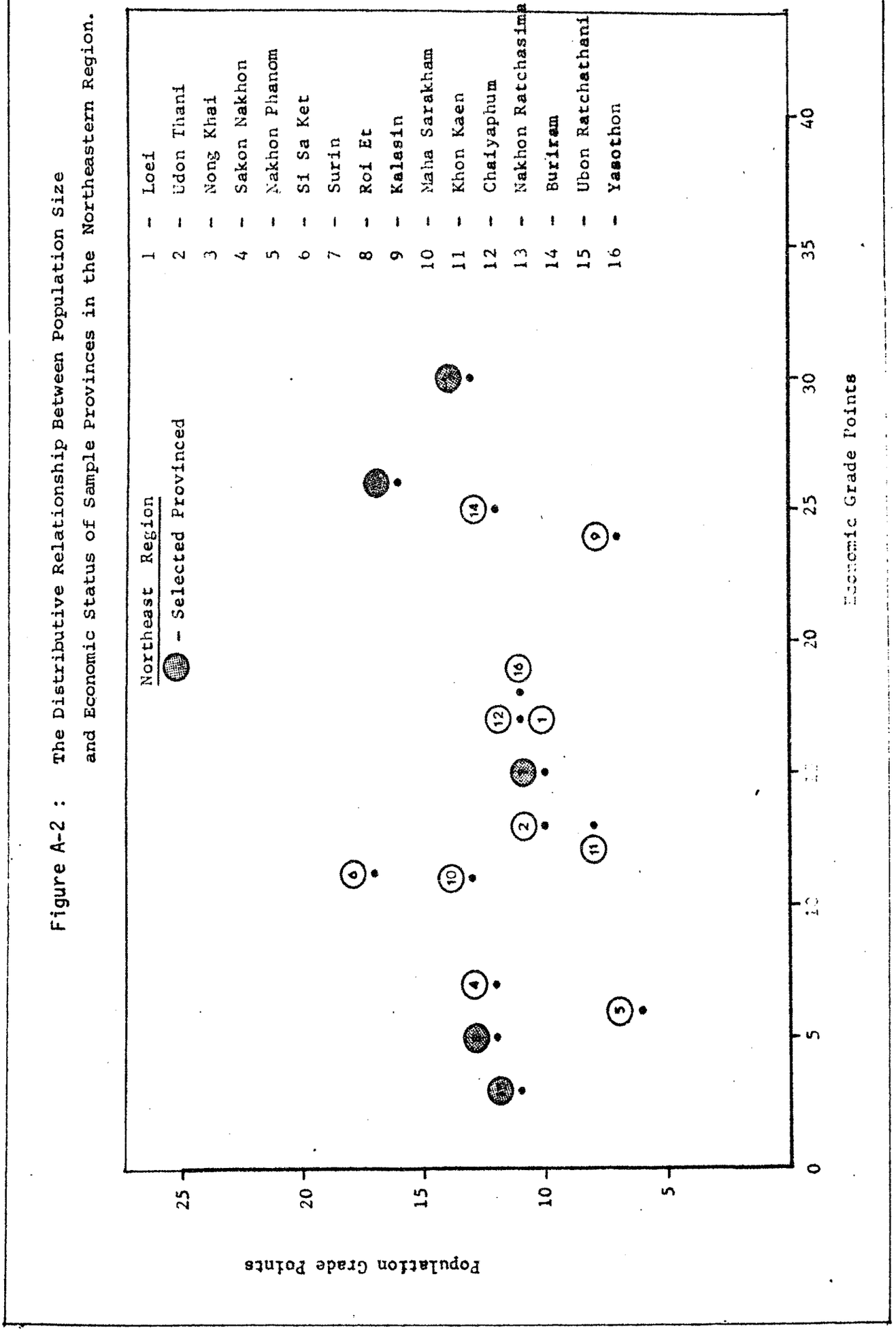


Figure A-3 : The Distributive Relationship Between Population Size and Economic Status of Sample Provinces in the Southern Region.

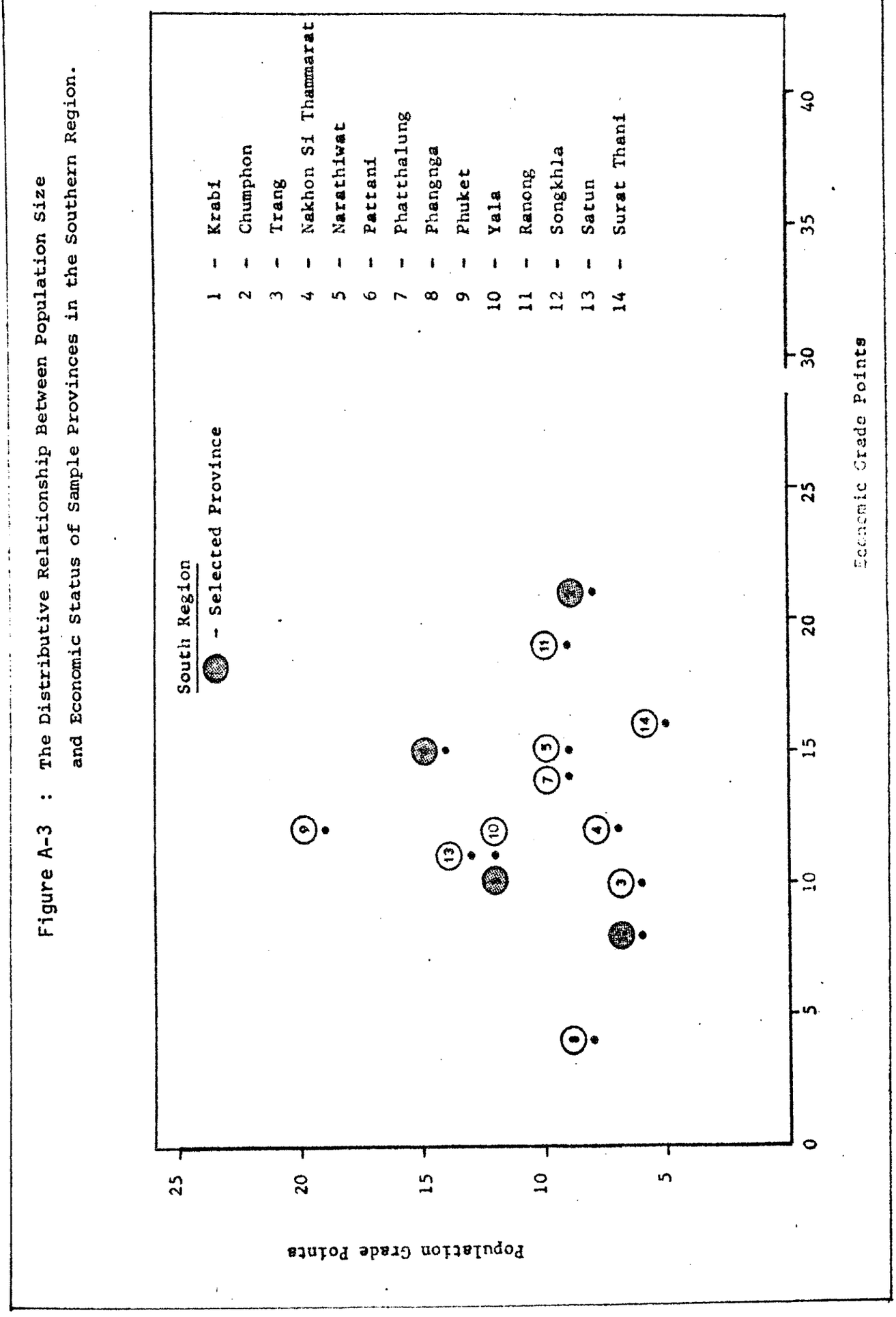


Table A-4 : Selected provinces, districts, sub-districts and villages.

Region	Province	District	Sub-district	Village
North	Chiang-Mai	Sankamphaeng	- Buak kang	Ban Rhon-khu
			- Sahakhon	Moo 4
		Fang	- Mae-Ngon	Ban Pa hon
		Chom Thong	- Yang khram	Moo 11
	Phayao	Mae-Chai	- Pha Faeg	Moo 1
				Moo 13
		Chun	- Lo	Ban Nom Chun
				Ban Si Muang Chum
	Uthai-Thani	Sawang Arom	- Puang song-nong	Moo 4
				Moo 12
		Thap Than	- Thung Na Thai	Moo 4
				Moo 6
	Phetchabun	Chon Daen	- Chon Daen	Ban Nong Daeng
				Ban Khlong Klang
		Wichian Buri	- Pu kham	Ban Pu Kham
				Moo 5
Northeastern	Surin	Sikhonraphum	- Khwao-yai	Moo 5
				Ban Sam rong
			- Nong Bua Ban	Ban Kham
				Ban Din Daeng
	Ubon-Ratcha-thani	Khuang Nai	- Tha ho	Moo Ban Pa Mai
			- Sang Tho	Ban Don Chiang Tho
		Muang Samsip	- Nong Hang	Ban Na Di
				Ban Thung Mani
	Roi Et	Thawatchaburi	- Nong Phai	Ban Nong Tao
				Moo 12
		Kaset Wisai	- Sing Khok	Ban Sing Khok
				Ban Nong Phai

(Continued)

Region	Province	District	Sub-district	Village
Northeast	Nong Khai	Si Chiang Mai	- Pho Tak	Ban Sao Lae Nua Ban Sao Lae Tai
		Phon Phisai	- Thung Luang	Ban Rong No Ban Pho Si
	Nakhon Rat-chasima	Pak Chong	- Nong Sa rai	Moo 5
		Pakng	- Nong Ma Nao	Ban Kao Kho
		Sung Noen	- Sung Noen	Moo Ban Pa Mai
		Chok Chai	- Tha Ang	Moo 12
South	Chumphon	Lang Suan	- Bang Ma Phrao	Moo 2 Moo 5
		Sawi	- Sawi	Ban Laem Bo Ban Pha-gun
	Krabi	Ao Luk	- Laem Suk	Moo 4 Moo 5
		Khlong Thom	- Phu Din na	Moo 6
			- Pa Lha	Moo Ban Pa Mai
	Songkhla	Sathing Phra	- Chum phon	Moo 2 Ban Nang Laeo
		Thepha	- Sa Khom	Ban Tha Mank Lak Ban Pu Lum Phi
	Pattani	Khok Pho	- Tha Rua	Ban Khon Pla
			- Pak Bon	Ban Ma Pang Man
		Nong Chik	- Ya Be	Ban ya be

2.3 Selection of Representative Sub-Districts.

In selection of representative of sub-districts from each representative districts is based principally on information of population, economic condition and occupation obtained from the district offices. However, the selection also considers settlement pattern, travel convenience, safely, lanquage, and assistence of public physical in infrastructure.

For principal criteria, three groups are set up for population and economic criteria according to the density and the wealthy respectively. As for the occupation criterion three groups of occupations are categorized as farmer, planter and others. Poi t 1, 2 and 3 are given to those sub villages of minor, the middle and the major groups. Different weights are also considered and assigned for each criteria. Weights 3, 2 and 1 are given to the economic, population and occupation criteria respectively. Points from the three criteria are summarized for each sub-village. The sub-villages of higher points are the prominent ones. Secondary criteria are now added into the consideration by the similar procedure without assignary the grade points the additional part is done only to see the norms. Slight adjustment is made for those sub districts of high grade point. Only two sub-districts are selected for the representative. An example of the selection process is presented in the Table A-5. The results of selection are also presented in the Table A-4.

2.4 Selection of Representative Villages and Families

The selection of representative villages is based on the concepts and principles similar to those used in the selection of representativ sub-districts. In most cases, 2 representative villages are selected from each representative sub-districts.

For each representative village, approximately 10 houses are selected for the survey. The selected houses include relatively high-income, medium-income, and low-income families.

Finally, the survey covers the sites as presented in the Table A-4.

3. Survey Method

In the survey, required information are collected through interview and actual observation. The interview is conducted at 3 levels, district level, village level, and family level. Details of each interview level are as follows;

(1) District Level : At this level, the interview is conducted with the chief district officer and is designed to collect basic information of the district, on socio-economic conditions, physical characteristics of the district, utilities, and past development activities as shown in Appendix 2.1. The information obtained are used as a basis for selecting representative sub-districts and villages.

(2) Village Level : The interview is conducted with the village headman or a village council member and is disigned to collect general information on socio-economic conditions, physical conditions, and building materials sources proximate to the village. The interview is based on the questionnaire in Appendix 2.2.

(3) Family Level : The interview is conducted with the family head or an adult member in the family and follows the questionnaire shown in Appendix 2.3. The objective is to collect the following information; social-economic and enoironment conditions in selected to housing, housing problems, housing proference, housing need, roles of developing agencies and needs for government assistance.

After the interview, technical details of the house are examined and recorded by hand drawing and taking photograph. The guidelines for the technical inspection is shown in Appendix 2.4.

In addition to the interviews, soil samples are also collected from areas proximate to the survey villages. The samples are analysed in the laboratary to evaluate its suitability for making soil-cement block.

Table A-5 : An Example of Sub-Village Selection.

Tambol	Economic Level			Population			Population Density			Occupation			Village Pattern			Transpertation (Dist & Gov.)			Communicity Security Language			Security			Sufficiency of Inf.			Total
	A	B	C	population	area km^2	Density	600 up	300 600	0-300	Farmer	Planter	Others	cluster	Dispersed	Mixed	Good	Fair	Poor	Good	Fair	Bad	Good	Fair	Bad	Good	Fair	Pos.	Grade Pos.
1. Thoke-Pho		o		3,447	24.0	142.4			o		o									o			o					14
2. Na-Krud		o		7,500	22.7	348.0																		o				15
3. Nang Kora		o		6,057	75.0	80.0			o																			17
4. Pa Bon		o		3,672	32.0	114.8			o			o								o				o				18
5. Sai Kao	o			3,284	17.0	193.2			o			o								o			o					12
6. Pak Le			o	4,374	26.6	171.9			o		o													o				13
7. Thung Pla		o		3,591	12.0	220.3		o				o								o			o					16
8. Na Pra Da	o			3,210	36.0	89.2			o			o								o			o					12
9. Nae Lan			o	6,503	46.0	143.1			o			o									o			o				15
10. Pa Rai			o	7,100	41.4	171.5			o												o			o				14
11. Tha Rua		o							o				o			o				o								
Grade	1	3	2				-	2	3	2	1	3																
Weight		3						2			1																	
Points	3	9	6				-	4	6	2	1	3																

Calculation of Total Grade Points

Village No. 1 = 9 + 6 + 1 = 16
2 = 9 + 4 + 2 = 15
3 = 9 + 6 + 2 = 17
4 = 9 + 6 + 3 = 18

Village No. 5 = 3 + 6 + 3 = 12
6 = 6 + 6 + 1 = 13
7 = 9 + 4 + 3 = 16
8 = 3 + 6 + 3 = 12

Village No. 9 = 6 + 6 + 3 = 15
10 = 6 + 6 + 2 = 14
11 = 9 + 6 = 15

Appendix 2.1

Questionnaire No. 1

Basic Informations of Districts

District.....Province.....

Date.....Interviewer.....

1. Social and Economics.

    1.1 Population of each sub-district.
    1.2 Education Levels of the people.
    1.3 Nationality and religions.
    1.4 Local Language.
    1.5 Major agro-occupations.
    1.6 Crops-produced.
    1.7 Gross district product.
    1.8 Agro-expenses per rai for each crop.
    1.9 Land use pattern in the district.
    1.10 Agro-Land holding.
    1.11 Family & Industry.
    1.12 Living Hazards.
    1.13 Identification of core village.

2. Construction Materials.

    2.1 Number of construction materials production plants in each sub-district.
    2.2 Raw-material resources.
    2.3 Number of construction material shops in each sub-district.

3. Basic-Geography

    3.1 Physical terrain of district.
    3.2 Climatic records of the district.

4. Physical Infrastructures.

   4.1 Roads and roads condition
   4.2 Water resources
   4.3 Electricity
   4.4 Health centre in any sub-district.
   4.5 Police station in any sub-district.
   4.6 School in any sub-district.
   4.7 Religious place in any sub-district.

5. Rotes of Developing Agencies and Development Results.

6. Major Problems in The Local Areas.

Appendix 2.2

Questionnaire No. 2

Physical Condition of the Village

Village No.....Sub-District.....

District.....Province.....

Date.....

Time of Interview from.....to.....

Interviewer.....

1. Settlement Pattern

- ☐ Clustered
- ☐ Lined
- ☐ Scattered
- ☐ Other.....

2. Terrain

☐ Mountainous ☐ Rolling ☐ Flat ☐ Other

3. Forest Condition

- ☐ Thick ☐ Thin
- ☐ None
- ☐ Other.....

4. Nature of Settlement

- ☐ Unplanned Age.....
- ☐ Planned by.....
- ☐ Other.....

5. Occupation

Major/Main.....

Secondary.....

6. Language

Primary.....

Secondary.....

7. Public Facilities

Irrigation	☐	in bound	
	☐	out bound	
Road	☐	Track	
	☐	Soil Surface	
	☐	Asphaltic Surface	
	☐	Other.....	
Electricity	☐	Available	☐ Not Available
Consumptive Water Source	☐	Rain	☐ Deep well
	☐	Pond	☐ Canal
	☐	Piped water supply	☐ Other.....

8. Water Resources for Agriculture

☐	River	☐	Natural
☐	Reservoir	☐	Canal
☐	Irrigation canal	☐	Other.....

Remark: Period of water availability.....

9. Components of Community

- ☐ School; Highest level of classes.....
- ☐ Religious Place.....
- ☐ Ancient Place.....
- ☐ Community Centre.....
- ☐ Market.....
- ☐ Police Station.....
- ☐ Health Care Centre.....
- ☐ Post Office.....
- ☐ Village Hall.....
- ☐ Silo, granary.....
- ☐ Recreation Area.....
- ☐ Public Water Well.....
- ☐ Electricity Station.....
- ☐ Irrigation Station.....
- ☐ Tourist Resource.....
- ☐ Others.....

10. Environment Problems

- ☐ Natural.....
- ☐ Robbery.....
- ☐ Terrorist.....
- ☐ Wild Animal.....

11. Past Development Records

Type 1.....:.....by.....

2.....by.....

3.....by.....

4.....by.....

5.....by.....

12. Construction Material

- ☐ Laterite.....
- ☐ Sand.....
- ☐ Rock.....
- ☐ Cement.....
- ☐ Cement Block.....
- ☐ Precast Post.....
- ☐ Fired Brick.....
- ☐ Wood, Timber.....
- ☐ Bamboo.....
- ☐ Galvanized Steel Sheet.....
- ☐ Thatch.....

13. Sketch of Village Plan

Appendix 2.3

Questionnaire No. 3

General Background Rural People

& Their Housing Need and Demand

Date.....Interviewer.....

Interviewed Person.....Occupation.....

House No.....Village No.....Tambon.....

District.....Province.....

1. Family Details

No.		Sex		Marriage Status	Age	Educat-ion	Profess-ion	National-ity	Religion
		Male	Femal						

2. Origin

☐ Birth place.....

☐ Removed from.....year.....

☐ Because of.....

3. House-Land Holding Status

☐ Owner ☐ Leasehold

☐ Relative's Land

☐ Other

4. House Holding Status

☐ Owner

☐ Leasehold ☐ Rent rate.....Bht.month

5. Agricultural Land Tenure and Production

☐ rice field.....rai Production.....

☐ plantation.....rai Production.....

☐ garden.....rai Production.....

☐ other.....rai Production.....

6. Secondary income

Source 1..... income rate.....

2..... income rate.....

3..... income rate.....

7. Expenditure

Consumables..... .....Bht/m.

Agricultural.....

Construction and

maintenance of House.....

Other.....

8. Savings

☐ Yes.....Bht/yr.

☐ No

☐ No. Answer

9. Borrowing

☐ Yes.....Bht/yr.

☐ No.

10. Purpose and Condition of loan

No.	Purpose	Type	From	Amount	Interest Rate

11. Nature and Amount of Return Payment

☐ Agricultural Product ☐ Labor

☐ Cash.....

☐ Term payment.....Bht/m.

☐ Other

12. Illness

1.....

2.....

3.....

13. Consumption water

☐ Rain water ☐ Sufficient

☐ Insufficient

☐ Pond water ☐ Sufficient

☐ Insufficient

14. Lavatory Availability

☐ Yes ☐ No

If Yes; do you use it?

☐ Yes ☐ No

15. Type of Lavatory.....

16. Waste water disposal

.....

17. Animals in Housing Compound

Type.....No.....

18. Satisfaction with the Condition of Community

☐ Yes ; Because.....

☐ No ; Because.....

19. If no, do you want to remove?

☐ Yes ; Remove to.....

☐ No ; Because.....

20. Do your children live in separate house(s) when they get married.

☐ Yes ; Because.....

☐ No ; Because.....

21. Living problems

☐ Difficulty of earning

☐ Health hazard

☐ Robbery

☐ Taken advantage by others

☐ Taken advantage by government officer

☐ Other

22. Priority need for physical development of community

- ☐ Water resource : Priority.....
- ☐ Road : Priority.....
- ☐ Electricity : Priority.....
- ☐ Hydrant water : Priority.....
- ☐ Housing : Priority.....
- ☐ Other : Priority.....

23. Respected people

1 .....

2 .....

3 .....

24. Community Development by Government Agencies

Agency	Development	Result

25. Development by Tambon Council

1 .....

2 .....

3 .....

26. Cooperation Among Villagers

- ☐ Road improvement
- ☐ Water resource development
- ☐ Construct new temple
- ☐ Growing crop
- ☐ Harvesting crop
- ☐ Building house
- ☐ Other.....

27. Membership of Cooperative

☐ Yes ☐ No

If no, do you want to be a member?

☐ Yes : Because.....

☐ No : Because.....

28. Need of government assistance in housing sector

☐ Yes ☐ No

29. If yes, What is Your Need

☐ House for sale ☐ Cash

☐ Term payment

☐ Financial support.....Bht/m.

☐ Return rate.....Bht/m.

☐ Equipment support

☐ Construction training

☐ Skill labor assistance

30. How do You Build Your House?

☐ By your self

☐ Cooperation among villagers

☐ Other

31. Housing Preference

1. Bamboo house with thatch roof

☐ Yes : Because.....

☐ No : Because.....

2. Bamboo house with galvanize steel roof

☐ Yes : Because.....

☐ No : Because.....

3. Wooden house with galvanizes steel roof

☐ Yes : Because.....

☐ No : Because.....

4. Half wood-half brick house with galvanized steel roof

☐ Yes : Because.....

☐ No : Because.....

5. Brick house with galvanized steel roof

☐ Yes : Because.....

☐ No : Because.....

6. Brick house with asbestos roof

☐ Yes : Because.....

☐ No : Because.....

32. Nature of Need for Housing

☐ Repair

☐ Improvement

☐ Rebuilding

33. Problem(s) in Housing Development

- ☐ Material.....
- ☐ Labor.....
- ☐ Skilled labor.....
- ☐ Equipment.....
- ☐ Material Transportation.....
- ☐ Other.....

Appendix 2.4

Questionnaire No. 4

Details of Houses

Interviewed Person.....Occupation.....

House No.....Village No.....Sub-District.....

District.....Province.....Note.....

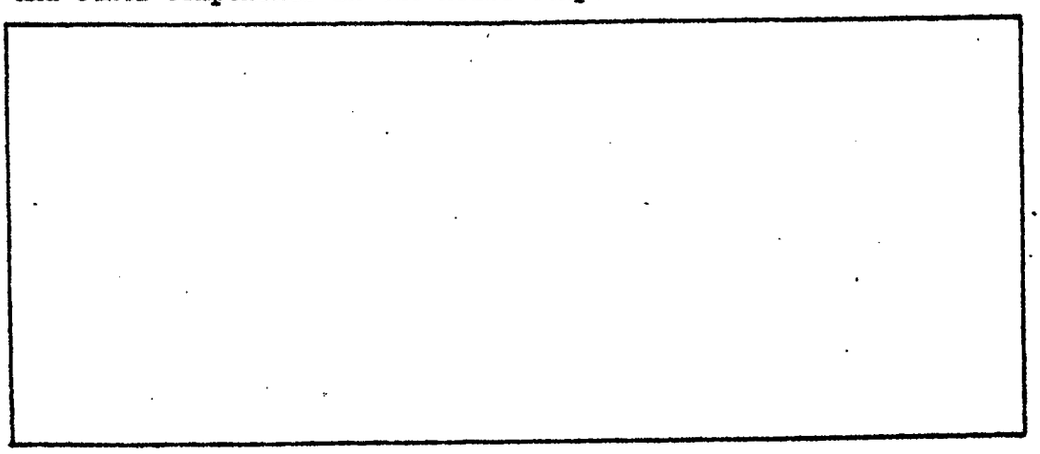
Date.....Interview.....

1. Feature

- ☐ One storey, on ground
- ☐ One storey, raised floor.....meter
- ☐ Two storeys
- ☐ Single house in the compound
- ☐ More than one house in the compound

2. Sketch of house(s)

and other components in the house compound



3. Material of each component of house

Footing.....

Post.....

Beam.....

Floor.....

Wall.....

Door.....

Window.....

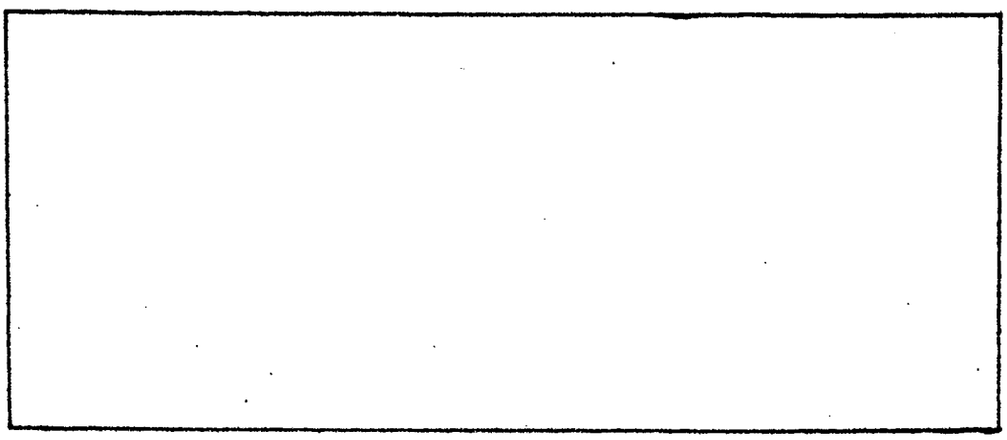
Under roof.....

Roof frame.....

Roof.....

Ladder or Stair.....

4. Sketches of plan view and side view(s) of house



5. Age.....Yrs.

6. Construction Cost.....Bht.

7. Construction Procedure

- ☐ Hiring
- ☐ Selfhelp
- ☐ Cooperate among villagers
- ☐ Duration.....months

8. Stage construction

☐ Yes ☐ No

9. Sequences of construction (in case of yes)

1 .....

2 .....

3 .....

10. Construction equipment

- ☐ hammer
- ☐ saw
- ☐ axe
- ☐ jack plane
- ☐ chisel
- ☐ plumb
- ☐ water tube
- ☐ measuring tape
- ☐ angle
- ☐ others

11. Cowries of construction materials

- ☐ buy from town or city
- ☐ buy in local area
- ☐ acquire from local area
- ☐ others.....

12. Opinion about condition of houses

- ☐ satisfy
- ☐ not satisfy

13. Problems in correction with houses

1 .....

2 .....

3 .....

14. Sequence of needs for soloving the problems

1 .....

2 .....

3 .....

15. Records of housing repair and maintenance

Footing	☐ Yes	☐ No
Column	☐ Yes	☐ No
Joist	☐ Yes	☐ No
Beam	☐ Yes	☐ No
Floor	☐ Yes	☐ No
Wall	☐ Yes	☐ No
Roof	☐ Yes	☐ No
Ladder or stair	☐ Yes	☐ No
Other	☐	

Appendix 3.1

Technical Details of SCB

1) Soil-Cement - Soil cement is a mixture of a selected lateritic soil with a certain percentage of cement (10-15% by weight) and a proper amount of water.

2) Soils which are applicable for soil-cement making

- Soils which are suitable for soil-cement making are mostly lateritic soils with the following properties :-

Chemical properties;
Chemical Composition

Fe_2O_3	ranges	1.5 - 3.0%
Al_2O_3	"	8 - 12%
SiO_2	"	75 - 85%
CaO + other matters		1.5 - 3.5%

Physical properties

- Loss on Igmition Less than 5%
- Dry Shrinkage 2-8%
- Fire Shrinkage 2.5-10%
- Particle size-should be mostly silt with some clay (All soils should be sieved through No.4 sieve before use.)

3) Mixture of Soil-Cement for Making Soil-Cement Block

- Proportion of the mixture for making soil-cement -block.

The proportion of soil, cement and water should be laberatorily designed. After obtaining the amount of CaO in the soil, the amount of cement used can be calculated from:-

$$C = \frac{G - F}{E - F} \times 100\%$$

when C = percent by weight of cement,
F = " " of CaO in soil,
E = " " of CaO in cement,
and G = " " of CaO in the mixture.

(The percentage of cement is practically in the range of 10-15% by weight).

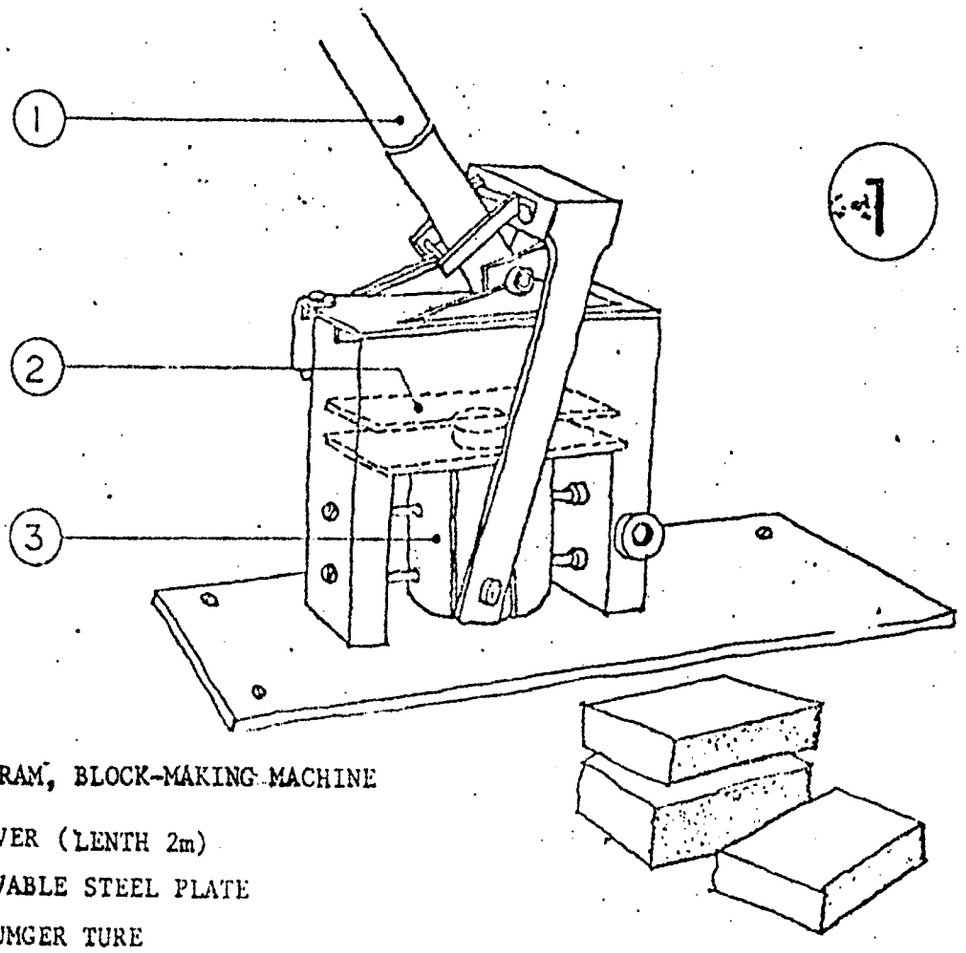
The proportion of water is equal to the amount of water at the optinium moisture content of the soil. The OMC of the soil is obtained from Laboratary test of the Standard Proctor Test Method.

- The mixture

The mixture should be uniform and homogeneous. Soil and cement should be throughroughly mixed before adding the water. Promptly after adding the water, mixing should be made to get the uniform and homegeneous mixture.

4) Soil Cement Block

SC block is a result of pressing soil-cement mixture in a mould under a centain amount of pressing energy. The pressing process can be portially or fully mechanized. The partial ones have been recently developed. One of them called "CINVARAM" is shown in the Figure C-1



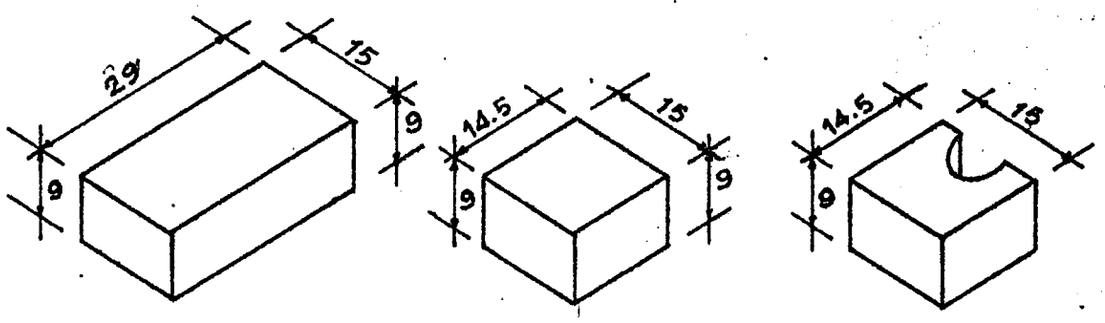
CINVA-RAM, BLOCK-MAKING MACHINE

1. LEVER (LENTH 2m)
2. MOVABLE STEEL PLATE
3. PIUMGER TURE

Figure C-1 CINVARAM

- Shape-Size

Shape of the S-C block can be of any form, but the using ones are as shown in the figure C-2. Sizes of the blocks are also presented in the same figure.



a) Full Block (9 x 15 x 29 cm^3)

b) Half Block (9 x 14 x 14.5 cm^3)

c) Carved Half Block

Figure C-2 Shape and Size of S-C Blocks.

- General Properties of S-C Block.

In general the required properties of S-C block are in the form of physical properties rather than the chemical ones. The required physical properties are as following:-

Moisture Absorbtion	:	not exceed 25%
Conpersive Strength	:	not less than 50 ksc.,
and durability	:	should pass at bast 6 cycle of wet and dry process without only damage or losing strength.

Appendix 3.2

Test Result of Collected Soil Samples

Source Location			Soil Type	Test Result
NORTHERN				
UTHAI THANI				
A.Sawang Arom	T.Phuangsongnang	M. 4	Silty Sand	Unsuitable
		M.12	Laterite	Unsuitable
A.Thap Than	T.Tungnathai	M. 4	Silty Sand	Unsuitable
		M. 6	Silty Sand	Unsuitable
CHIANG MAI				
A.San Kamphaeng	T.Cooperative	M. 4	Laterite	Unsuitable
	T.Buak Kang	M. 6	Laterite	Unsuitable
A.Fang	T.Maengon	M. 3	Laterite	Unsuitable
A.Chom Thong	T.Ban Yangkam	M. 1	Laterite	Unsuitable
PHAYAO				
A.Chun	T.Lau	M. 5	Laterite	Unsuitable
		M.11	Sand	Suitable
A.Mae Chai	T.Paphad	M. 1	Silty Sand	Unsuitable
		M.13	Laterite	Unsuitable

Remark : A :- Amphoe or District
T :- Tambon or Sub-District
M :- Mu Ban or Village number

(Continued)

Source Location	Soil Type	Test Result
SOUTHERN		
CHUMPHON		
A.Lang Suan T.Bangmaprao M. 2	Silty Sand	Unsuitable
M. 4	Laterite	Unsuitable
A.Sawi T.Sawi M. 3	Laterite	Unsuitable
KRABI		
A.Khlong Thom T.Prudinna M. 6	Laterite	Unsuitable
A.Ao Luk T.Lamsak M. 4	Laterite	Unsuitable
SONGKHLA		
A.Sathing Phra T.Chomphol M.3	Sand	Unsuitable
M.2	Laterite	Unsuitable
A.Thepha T.Sakom M. 4	Laterite	Unsuitable
PATTANI		
A.Khok Pho T.Pakbon M.7	Sand	Unsuitable
NORTHEASTERN		
NAKHON RATCHASIMA		
A.Pak Chong T.Nong Sa Rai	Laterite	Unsuitable
A.Khong T.Nong Ma-Nao	Laterite	Unsuitable
A.Chok Chai T.Tha Ang	Laterite	Unsuitable
A.Sung Noen T.	Sand	Unsuitable
A.Sikhiu T.Lat-Bua Kao	Laterite	Unsuitable
A.Muang T.Khok Kuad Km.15-16	Laterite	Unsuitable

(Continued)

Source Location	Soil Type	Test Result
ROI-ET		
A.Phon Thong km.20 T.Non Thai Si	Laterite	Suitable
A.Sclaphum km.29 T.Tha Sa Baeng	Laterite	Suitable
A.Kaset Wisai T.Sing Khok	Silty Sand	Unsuitable
NONG KHAI		
A.Sai Chiang Mai T.Nong PaPat	Laterite	Suitable
BURI RAM		
A.Nang Rong km.12 T.Nong-Bot	Laterite	Unsuitable
UDON THANI		
km.12 Udon-Loei Rd.	Laterite	Unsuitable
SURIN		
A.Rattanaburi T.Nong-Bua Ban	Laterite	Unsuitable
km.18-19 Rattanaburi-Tha Tum Rd.	Laterite	Suitable
Tha Tum-Surin Rd.	Laterite	Suitable
UBON-RATCHATHANI	Laterite	Suitable

Appendix 3.3

Breakdown Costs of Two Housing Designs.

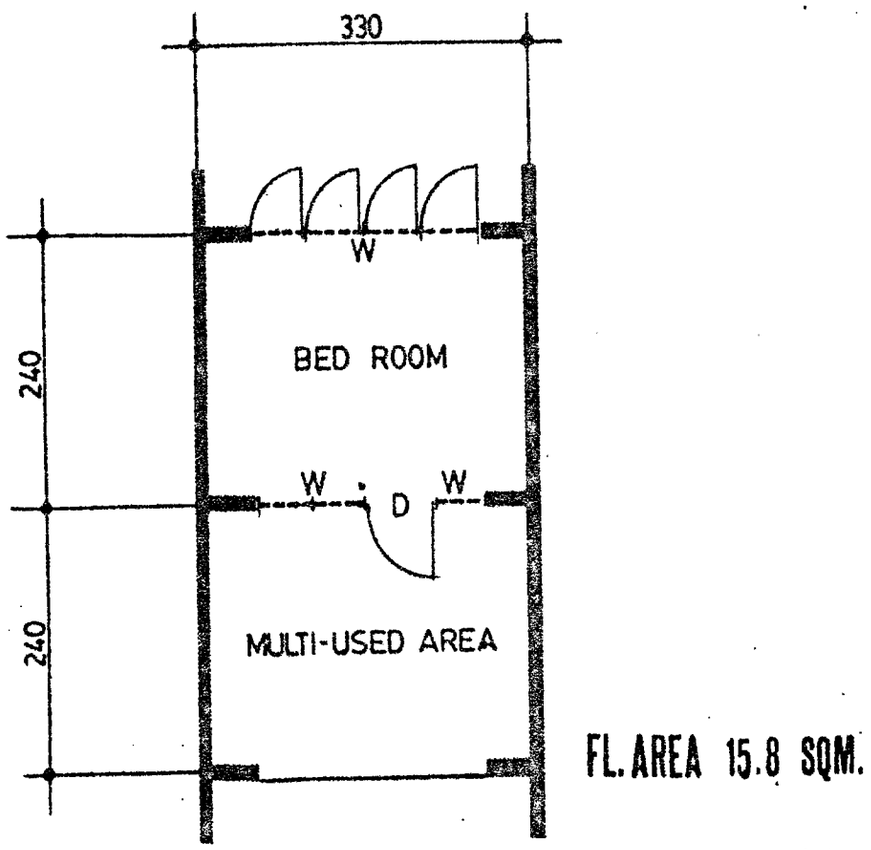


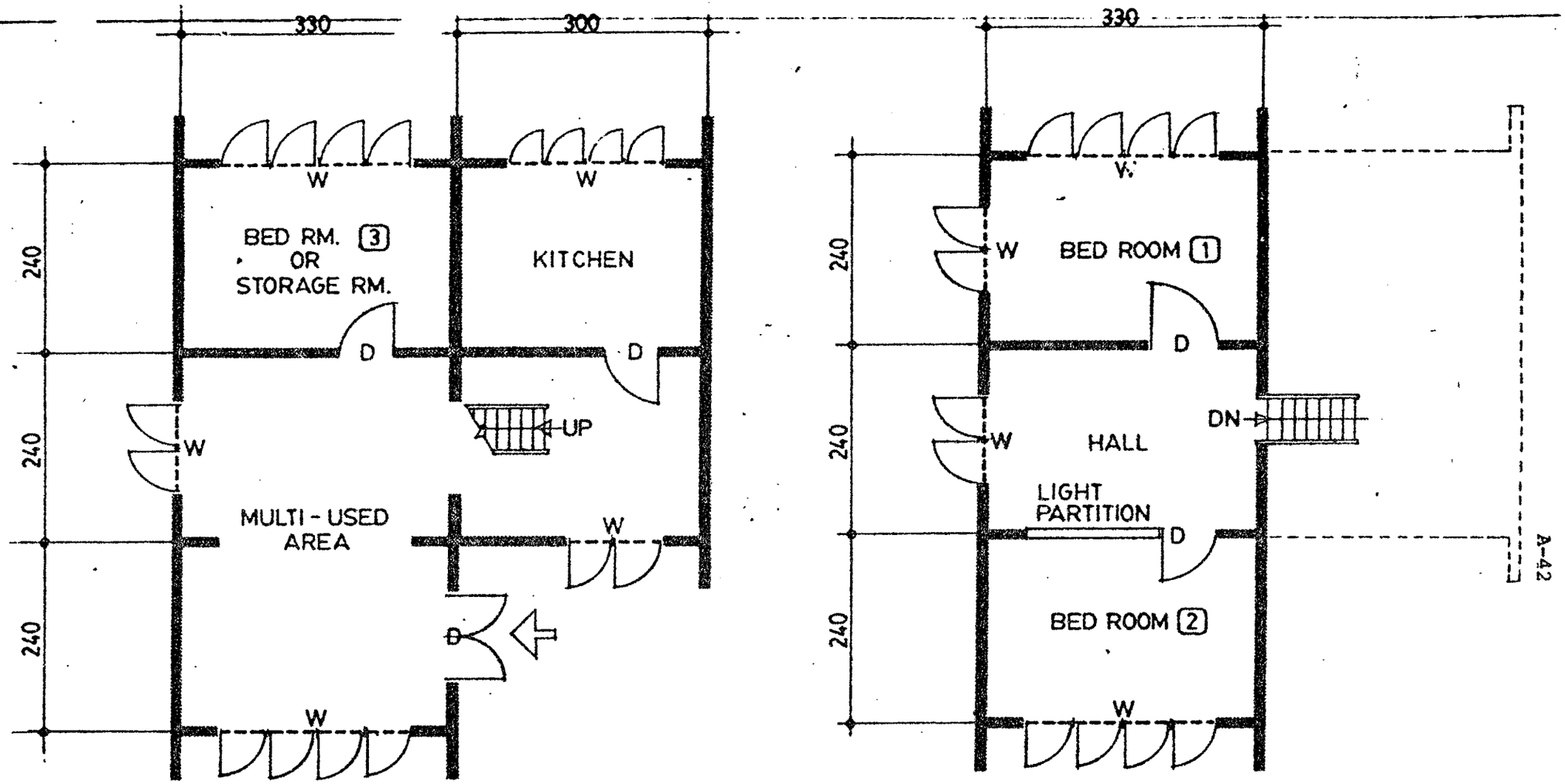
Figure C-3 TYPICAL FLOOR PLAN 1:75
FOR ONE STOREY HOUSE RESTED ON GROUND

Table C-1 : Details of Breakdown-Costs
(One Storey House Rested on Ground, See Figure C-3)

Component	Materials	Unit	SCB				Wood				Concrete Block			
			Quantity	Unit cost	Total	%	Quantity	Unit cost	Total	%	Quantity	Unit cost	Total	%
Super Structure Component (Roof Structure)	Purlin	ft^3	7.18	180	1,292		7.18	180	1,292		7.18	180	1,292	
	Rafter	ft^3	8.37	180	1,506		8.37	180	1,506		8.37	180	1,506	
	Roof beam	ft^3	2.55	180	459		2.55	180	459		2.55	180	459	
	Ridge pole	ft^3	1.43	180	258		1.43	180	258		1.43	180	258	
	To set up	ft^3	0.76	180	137		0.76	180	137		0.76	180	137	
	Beam	ft^3	2.05	180	370		2.05	180	370		2.05	180	370	
	Total	ft^3	22.34	180	4,022	31.95	22.34	180	4,022	18.22	22.34	180	4,022	30.48
Supporting Structure Component (Column, Beam,Footing)	Footing	m^3	2.43	950	2,308						2.43	950	2,308	
	Stump 2.00m						8.0	120	960					
	Post 5" x 5"						10.26	180	1,860					
	Beam						3.28	180	590					
	Joist						6.84	180	1,232					
	Total				2,308	18.33	20.38	180	4,628	20.97			2,308	17.49
Floor	Wood						16.27	180	2,928					
	SC-bamboo -reinforce -ment		1.41	534	752									
	Concrete Slab on - Ground										1.41	850	1,198	
	Total				752	5.97			2,928	13.27	-		1,198	9.08

(Continued)

Component	Materials	Unit	SCB				Wood				Concrete Block			
			Quantity	Unit cost	Total	%	Quantity	Unit cost	Total	%	Quantity	Unit cost	Total	%
Wall	S.C.Block		613	1.50	920									
	Concrete Block 4"										333	3.5	1,082	
	Wood ½" x 6" stub													
	1½" x 3"						32.8	180	5,904					
	Total				920	7.31			5,904	26.75			1,082	8.2
Roof	Corrugate 2'x 6'	plate	24	45	1,080		24.0	45	1,080		24.0	45	1,080	
	Galvanized Iron (2½' x 6')	plate	4	45	180		4.0	45	180		4.0	45	180	
	Total				1,260	10.01			1,260	5.71			1,260	9.55
Door	Door Frame	ft^3	3.86	180	694		3.86	180	694		3.86	180	694	
	Assossrve	set	1.0	105	105		1.0	105	105		1.0	105	105	
	Total			799	6.35				799	3.62			799	6.05
Window	Window Frame	ft^3	4.12	180	742		4.12	180	742		4.12	180	742	
	Corrugate	plate	8	45	360		8	45	360		8	45	360	
	Assossrves	set	1	26	26		1	26	26		1	26	26	
	Total				1,128	8.96			1,128	5.11			1,128	8.55
Others	Lime Mortor			400	400									
	Embankment			1,000	1,000									
	Total				1,400	11.12			1,400	6.34			1,400	10.61
	Gross total				12,589	100			22,069	100			13,197	100



TOTAL FL. AREA 61.92 SQM.

FIRST FLOOR PLAN 1:75

SECOND FLOOR PLAN 1:75

Figure C-4 TYPICAL FLOOR PLAN
FOR TWO STOREY HOUSE

Table C-2 : Details of Breakdown-Costs

(Two Storey House, C-4)

Component	Materials	Unit	SCB				Wood			
			Quantity	Unit Cost	Total		Quantity	Unit Cost	Total	%
Super Structure Component (Roof Structure)	Purlin	ft^3	14.4	180	2,592		14.4	180	2,592	
	Rafter	ft^3	17.4	180	3,132		17.4	180	3,132	
	Ridge pole	ft^3	2.2	180	396		2.2	180	396	
	Roof beam	ft^3	5.2	180	936		5.2	180	936	
	King Post	ft^3	1.0	180	180		1.0	180	180	
	Tie Beam	ft^3	2.7	180	486		2.7	180	486	
	Total	ft^3	42.9	180	7,722	14.39	42.9	180	7,722	20.68
Supporting Structure Component (Column, Beam, Joist, Footing)	SCB Footing						2,234	1.50	3,351	
	Post 6" x 6"	ft^3	29.69	180	5,344					
	Footing and Stump	m^3	2.41	950	2,289					
	Concrete Footing						4.95	950	4,702	
	Beam	ft^3	5.54	180	997		4.90	180	882	
	Joist	ft^3	15.28	180	2,750		15.28	180	2,750	
	Total				11,380	21.21			8,334	22.33
Floor-Ground Floor -Upper Floor	Concrete 8 cm.	m^3	3.62	850	3,077		3.62	850	3,077	
	Wood 1" x 6"	ft^3	25.58	180	4,604		25.58	180	4,604	
	Total				7,681	14.31			7,681	20.58

(Continued)

Component	Materials	Unit	SCB				Wood			
			Quantity	Unit cost	Total	%	Quantity	Unit Cost	Total	%
Wall - Ground Floor	SCB						625	1.50	938	
	Wood 1" x 6" Stud 1½x 3"	@ 60 ft³	36.0	180	6,480					
- Upper Floor	SCB						347	1.50	520	
	Wood 1"x6" Stud 1½ x3"	@ 60 ft³	46.57	180	8,280					
	Total				14,760	27.50			1,458	3.91
Roof	Corrugate 2' x 6'	plate	95.0	45	4,275		95.0	45	4,275	
	Galvanized Iron 2½'x 6'	plate	6.0	45	270		6.0	45	270	
	Total				4,545	8.47			4,545	12.18
Door	Upper Door Frame	ft³	1.63	180	294		1.63	180	294	
	Ground Door Frame	ft³	6.79	180	1,222		6.79	180	1,222	
	Total		8.42	180	1,516	2.82	8.42	180	1,516	4.06
Window	Upper Window Frame		11.47	180	2,064		11.47	180	2,064	
	Ground Window Frame		18.94	180	3,409		18.94	180	3,409	
	Total		30.41	180	5,473	10.20	30.41	180	5,473	14.67
Stair	Wood		3.28	180	590	1.10	3.28	180	590	1.58
	Gross total				53,667	100			37,319	