Concluding Chapter

In this concluding chapter we first remind ourselves of the basic questions regarding indigenous and import-intensive technologies that we have been pursuing in this study. We then summarise what we have discovered regarding the realtive performance of these technologies and the distribution of costs and benfits from adopting one set rather than the other. We outline the reasons (~~we have presented regarding~~) why indigenous technologies, despite their superior performance are being superceded; reasons to do with Pakistan's national objectives and policies, ~~and more specific~~ social, and insitutional factors. The development of indigenous technologies will have to be based on their adoption, in the first instance in the rural areas and through the local government system. From here and with the requisite modifications they may spread among low-income groups in the urban areas.

However, although the rural areas and the local government structure offers a potentially conducive environment for the promotion of indigenous technologies, decision makers will not necessarily select such technologies of their own accord. The bulk of the chapter concentrates on key and 'doable' measures required to encourage the selection of such technologies, their adoption in local government buildings and spread among the rural populace.

1 The Story Thus Far.

Basic questions of study. Is there significant advantage in adopting indig. vs import-int. techs? If so, why latter adopted and what can be done to promote former?

Conclusions thus far. Significant advantage in adopting former not only in terms of equity (affordability, employment and income distribution) but also efficiency (cost-effectiveness in market and shadow prices, capital and labour productivity, and profit) criteria. This true for plannable fiture given existing price trends. Furthermore constr. projects using indig. tech. ~~much~~ more effective medium for promoting particpation, decentralisation and local institutions.

Reasons import-int. being adopted

1) Need and demand for such tech. in upper-income housing and large-scale public infrastructure projects - dams, highways- etc. Therefore both public and private investment and govt. policies ex. import-subsitution, tax, subsidies, pricing etc committed to developing the necessary materials industries. to the detriment of indig. techs. and maters. ind.

2) Ingrained belief in superiority of import-int. techs. for large and small-scale constr. At most accept indig. equitable and low constr. cost but say import-int. more efficient and cost -effective. ~~if consider maint.~~

3) Number of other social-insitutional factors which make apparently favourable charcterisitics of indig. tech. either irrelevant or undesirable, such as rising opp. cost of self-help as income and settlement size increase, ~~lack of~~ undermining of the indig. maters. industries and building skills, prestige associted with imp.int. constr., restrictive building codes, budgeting biases towards capital rather than current incl. maint. expendits., personnel training bias etc. All these apply however, more to upper-income, large cities and centralised conventional constr. agencies than to lower income, smaller settlements and more decentrlised, local govt. agencies.

Given upper-income and govt. commitment to import-int. techs. unrealistic to expect fundamental shift ~~reversing this commitment~~ in support of indig. tech. The many, now familiar policy measures urged by appropriate technology groups and more recently by supporters of the informal sector and the small-scale indigenous construction industry are all valid to varying

degrees but assume a level of government commitment that is often not available. 1

Govt. support of indig. sector still possible, if a) seen to fit into and further ~~some~~ other key dev. objecitves on which govt. places political importance b) does not make significnt demands on govt. resources and c) is complementary to, not competitive against, existing import-int. ind. to which govt. heavily commited.

In Pakistan context,
All above possible if design program to develop indig. constr. techs. (and therefore sector) to fit/dovetail? govts. program to develop small towns and rural areas especially through the Local Government structure. Have discussed govt. heabily

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1/ ~~It is conventional for~~ Advocates of appropriate technology and more recently those of the infpormal sector including the indigenous construction sector ~~to present a list~~ urge a # of measures that must be taken to promote these technologies and sectors. (see for example United Nations Moavenzadeh,) Such measures ~~range from~~ include removing subsidies in import-intensive materials, providing credit and technical assistance to the indigenous construction sector and the retraining of engineers.

While we have discussed the significance of these measures, we do not emphasise their adoption ~~as a prerequisite to the development of the indigenous construction sector~~ here. This is because, first they are well known and second that to be implemented, they require from the outset, a greater commitment to the indigenous construction sector than is often present in most governments. Thus such measures remain 'wish-lists' rather than ~~practical steps that can be followed~~ implementable steps leading to the development of this sector. Here we focus on more modest, localised measures that are 'doable' without a major what government commitment. ~~but ones that if~~ If, however, such successful may develop such a commitment ~~leading~~ to ~~a~~ wider ranging technology policy which changes more substantial and lasting shifts towards developing the appropriate indigenous technologies.

see modest measures

committed to this program. Indig. tech. - constr. and maters. ind. - have comparative advantage over import-int. in these areas. Local Govt. and local elite structure potentially much more sympathetic to such techs. (not least because gains most by adopting them)

Further social sector, which gradually passing most of its constr. budgets and implementation respnsibilities to the local govts., has the largest building budget of all the govt. sectors and constr. is the major develoment activity of the local governmetn. ~~Thus symbiotic relationship between furthering~~ therefore the objectives of local govt. and district development and those of promoting and indigenous constr. sector are mutually reinforcing.

Thus most effective to route program to promote indig. constr. and maters. thrugh the local govt. structure in the small towns and rural areas. Once indig. techs. and industries tried and established in these areas, may be modified and expanded to meet needs of urban low-income groups.

Beyond the scope of this study to detail what such a program would be. Here we outline ~~in an indicative fashion its major characteristics and the~~ what we have learnt from the study pointing what a program to provide indig. techn. must do and not do, the major characteristics of such a measures ~~required~~ to encourage the adoption of indigenous technologies in the rural areas. progressive and finally illustrative reasons why suggest some

2 Major Characteristics.

Such a program would be incremental and demand oriented. It would rely on getting indigenous technologies adopted in small-infrastructure and residential scale, community facility buildings. ~~that~~ such construction projects are many and spread out such as rural feeder roads, schools, health centres, etc. Through this 'learning by doing' technical, social and institutional problems will be addressed to improve the technologies and smoothen the social and institutional process for their implementation and spread. Through such imporvements and the example set by them the technologies will be popularised in the private sector; the low and middle-income market in the rural areas in the first instance and with the requisite modifications spread to the urban areas.

The consequent demand created in the indigenous materials production sector would be the boost required to put this sector on the road to development. The evidence in this study suggests that increasing demand may be the single most important measure to encourage the development of such capital un-intensive industries, far more important than extending credit for example, which is usually the major policy measure urged for this sector.

The incremental nature of this approach will also avoid the promotion of the indigenous construction industries posing

too immediate and obvious a threat to the import-intensive ones. It will allow time to discover whether the overlap in the market for such indigenous technologies and the import-intensive ones is such that the two sectors are significantly competitive or whether they are distinct and complementary.

2 Measures to Encourage the Selection of Indigenous Technologies.

As discussed in previous sections, although the rural and the local government environments are more conducive to making appropriate technology choices, they are by no means free of the pressures that lead to innapropriate choices. A program that merely devolves responsibility for construction and technology choice ~~is~~ will not ~~going to~~ insure that the appropriate choices are made. Specific measures have to be taken to reinforce such choices.

Speak primarily of influencing choices of LGRD officials and elected councillors through whose actions, say in adopting improved indigenous technologies in construction they implement, the choices of the private sector, small industries, buider-contractors and individual home owners, could be ~~influenced~~ affected. Demonstration effect of local school could prompt individuals to adopt technology used there. Demand for agri-waste bricks created by using them in road

soling could prompt more kiln entrepreuners to switch to this production technology.

Also speak primarily of construction rather than production technology although most points below apply to both.2

2.1 Right to Choose

Basic Prob. locals don't have right to choose. Basic is right to choose. Therefore devolve decision-making over which tech. to adopt, to local govt. The LGRD technical departments at the provincial level could design alternative specifications for the main construction projects - roads, water-supply, buildings etc - for groups of districts with similar resource and climate conditions, alternatives which range from the minimum acceptable indigenous to a more import-intensive alternative with some intermediate possibilities. 3

These specifications could be offered as guidelines from which the local authorities (or a village project committee) could either make direct choices or select with modifications. The specifications, ~~as incremental improvements~~ which represent progressively higher construction standards would also serve as

2/ The reader is reminded that although we focus here on construction, the issues and approaches outlined below (as in the study in general) applies to project ~~development~~ planning and implementation as a whole at the local level.

3/ Establishing such alternative specifications is simpler than may appear. Over a relatively short period, this writer

~~could also be~~ guidelines on how the project could be incrementally upgraded/improved ~~for improving the construction over~~ overtime.

This approach, rather than that of 'let the locals design', the stiff opposition that provincial technical depts. would mount to releasing technical control to the local levels indeed is perhaps more realistic given the limited technical capabilities at that ~~the local~~ level. ~~Not least, it meets an important and not unreasonable concern expressed by technical departments at the central~~ provincial levels ~~for preserving some control over standards. while~~ At the same time it serves ~~meting~~ the objective of devolving (guided) decision-making? choice down to the local level.

~~Furthermore,~~ By allowing the provincial tech depts at the level to design set the ranges of standards permissible in specific constr. types, it mollifies their not unreasonable concern for some control over constr. quality & standards.

However, being given a range of possible options does not insure the most appropriate one will be selected. Information has to accompany choice.

2.2 Adequate and Accurate Information to Make Informed Choices.

There is a Need to make informed choices; fully cognisant of costs and benefits and how they distribute among the various groups.

Insert p. 9a

As clear from chapter 2 ~~outset of study~~ inadequacy of information and simple ~~of~~ methods to obtain and analyse data on indig. tech. is a ~~it~~ major obstacle to developing ~~indigenous~~ such technologies. Consequently entrenched popular misconceptions are suggesting it to be inferior relative to import-intensive technologies whereas seen opposite could be the case. ~~Lack of explicitness in the trade-offs from~~ Furthermore lack of clarity in the distributive costs & benefits from alternatives ~~choices~~, especially ~~who gains and who loses,~~ how the local elite could benefit from promoting their indigenous constr. sector, (which as we have seen also helps the local low-income groups) ~~neutralises their~~ ~~support for this~~ keeps this elite from supporting ~~such~~ this sector, a support crucial if indig. constr. methods are to be promoted.

Such information strengthens the position of policymakers at the central or provincial govt. levels who are sympathetic to the indig. sector.

Also seen that shift to indig. techs. would benefit local elite in addition to low-income groups. Such information would mobilize the support of such groups which is crucial if local-level projects are to be successfully implemented.