Chapter 6

Commercialization and Market Linkages for Promoting the Use of Local Rice Varieties: A Nepalese Case Study

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Summary

Commercialization and marketing of traditional crop varieties (referred to as landraces) and their products is one of the major strategies to address conservation and sustainable use of crop genetic resources. The major policies related to commercialization of the genetic resources are designing mechanisms to:

• support and promote industries in using the genetic resources;
• promote seed development industries (including biotechnology);
• create gene markets, and encourage resource and credit flow; and
• encourage farmers and small entrepreneurs to diversify products from traditional varieties of crops.

This case study provides relevant information that will contribute towards developing a policy framework for the commercialization of traditional crop varieties and their products in Nepal.

The concept of farm business income as a tool for economic analysis is used to measure the willingness of Nepalese farmers to continue growing traditional landraces in the long term, and thereby competing with improved varieties in terms of yield and income. The results have shown that while utilizing their own genetic resources, which have limited alternative uses, rice producers have
managed to get some benefit and enhance the productivity of the landraces. Moreover, retaining traditional varieties by the traditional farmers may also be explained by such economic rationales that give better resonance and resilience to the family, immunity to higher market fluctuations and protection against natural disasters.

This case study also presents the prospects of commercialization and potential for promoting the marketability of underutilized landraces as well as their products. The results have shown that local people are the main consumers of the local products, though many foreigners have also been consuming these products. The study suggests possibilities of promoting value added enterprises for some of the selected traditional crop varieties. With the enhancement of the profitability of such enterprises, farmers will be willing to participate in maintaining the diversity of traditional rice varieties that need public intervention.

Introduction

Commercial use of genetic resources (GRs) is one of the major strategies of effective biodiversity conservation. The use of GRs and their products in commercial value chains can generate income and other non-income benefits for conservationists and providers of GRs. This approach will also help in designing cost- and benefit-sharing approaches for the conservation and use of the resources.

Commercialization of GRs and their products highly depends on their potential market values. The market values, in turn, depend on the magnitude of commercialization, on the genetic technology industry’s willingness to pay for samples of GRs and on the revenues a single provider can earn.

The major policy-related issues for the commercialization of GRs are to design mechanisms to support and promote industries in using GRs, which will then help to promote seed development industries including biotechnology; to create gene markets; to ensure credit flow for promoting commercialization of GRs; and to encourage farmers and small entrepreneurs to diversify GRs. Landraces with socio-cultural and market-preferred traits are few in number but have the potential to be conserved on-farm (Rana et al, 2007).

Taking commercialization and marketing of traditional GRs and their products as policy options to address the conservation and sustainable use of GRs, the purpose of this case study is to generate relevant information that will contribute towards developing a policy framework for the commercialization of traditional local rice varieties in Nepal. The study will explain the economic behaviour of traditional rice farmers who cultivate and maintain GRs at costs not compensated by the ongoing market prices. Despite the failure of the market to reward their contribution, farmers have continued to cultivate traditional crop varieties as long as they can meet the costs with their own home-grown inputs.

The study further reports relevant policy implications for promoting the products of neglected and underutilized local traditional rice varieties. Such products are gradually but slowly entering the market value chain. Supporting the
development of niche product enterprises and forming public-private partnerships for the conservation and utilization of traditional varieties can improve both farmers’ livelihoods and conservation outcomes.

**Methodology**

The farm income analysis of local rice landraces was undertaken in the Begnas area of Kaski district. Fifteen rice-cultivating farm households were selected for this case study. The following relationships for the income and the cost valuation of local landraces were applied:

\[ \text{Net income (NPR/ropani)}^1 = \text{Gross income} - \text{Total cost} \]

\[ \text{Farm business income (NPR/ropani)} = \text{Gross income} - \text{Cost of purchased inputs} \]

(Eqn 6.1)

Estimated farm business income is the income to the farm family from the crop after deducting the out-of-pocket costs of purchased inputs from the total income. The costs of own (non-purchased) inputs (labour, home saved seeds, manure, etc.) were not included in the cost calculation. Thus, the farm business income only gives a proxy of income as a return to own inputs and family labour. The study implicitly assumed that most of the farmers’ own resources had very little alternative uses under the subsistence agriculture. Though this assumption may not be fully correct, the approach still explains farmers’ rationale for engaging themselves in the traditional crop-farming business despite net loss (in the strict financial sense) in the cultivation of the crop.

**Commercialization and marketing of traditional crop varieties**

Farmers, consumers and sellers in Kathmandu Valley (Kathmandu, Lalitpur and Bhaktapur) and entrepreneurs and consumers of Palpa (Tansen Municipality and Suburb Pokhathok), mid-hill areas of Nepal and Butwal haat bazaar (a Terai market with mixed community of hill and Terai people) were surveyed to assess the prospects of commercialization and the potentials for promoting and marketing local rice varieties (and their products) grown by Nepalese. Prospects for promoting commercialization of underutilized local rice varieties were also explored. Respondents were randomly selected for the interviews.
**Description of the study sites**

The study area (Kaski district) is in the mid-hill region (800–1500m above sea level) of Nepal. The topography of the region consists of ancient lake and river terraces found on moderate to steep slopes. It experiences high rainfall (>3900mm/annum) with a warm temperate to subtropical climate. Mean daily minimum temperature of the coldest month is 7°C and the mean daily maximum of the hottest month is 30.5°C with monthly mean of 20.9°C (Sthapit et al, 1999; Rana et al, 2000).

The area is reported to be a hotspot in terms of crop diversity (Rijal et al, 1998). A total of 32 crops were reported to be grown. The major crops are rice, maize and finger millet. Rice, the major staple crop, is grown in different environments (lowland, irrigated land, partially irrigated land, rain-fed and upland). The total rice varieties maintained by the local farmers in this area are about 69 (Rijal et al, 1998), 63 of them local (Rana et al, 2007).

**Sampling for cost of production study**

Out of 50 rice-growing farmers sampled in the Begnas area, 15 rice growers were sub-sampled for the analysis of input uses and cost of production for rice. The rice farmers in the district are homogenous and farm-to-farm variation is very low. Most of the farmers are growing rice with similar sets of inputs. The purchase of inputs and sales of outputs are done in local markets and most of the farmers fetch similar prices for their products. Due to such homogeneity among the farm households, even a small proportion of the total households can represent their situation well. Moreover, for the study on the marketing of underutilized local crop species and their products, more than three dozen entrepreneurs, shopkeepers and departmental stores (of Kathmandu Valley, mid-hills town like Lansen and a Terai-located town like Butwal, both in the western region of the country) were interviewed with a structured questionnaire. The questionnaires covered the production, production costs and rice variety attribute preferences of the interviewees.

**Input cost and income analysis**

Table 6.1 reports input cost and income analysis of eight local varieties of rice. Net income was calculated by deducting the total costs from the gross income. Farm business income is obtained by deducting the costs of purchased inputs from gross income (see ‘Methodology’, above). As there is neither tax nor subsidy on farm income, the farm business income is the family income. The traditional varieties – Anga, Chotte, Local Mansuli and Mansara – were found to provide negative net incomes to the farmers. However, excluding Mansuli, they generated positive farm business income. For Anadhi, average farm business income (NPR
1808) was almost five times its net income (NPR 362). Jetho Budo ranked very high in net income (NPR 1393) and provided the second highest farm business income (NPR 2392). Bayarni Jhinuwa provided the highest average farm business income of NPR 2438, but its net income was almost half of the Jetho Budo. Farmers cultivating Bayarni Jhinuwa gained higher benefits by using more of their own inputs and less purchased inputs. Farm income of these farmers was higher than that of Jetho Budo farmers, though the latter earned more net income. Maintaining traditional varieties by traditional farmers might be partly explained by the better resonance and resilience to the family, immunity to higher market fluctuations and protection against natural hazards.

Jetho Budo and Anadhi resulted in better net income because they were in high demand and their market price was also higher than that of other varieties. Despite the net loss which farmers faced by growing some other landraces, their farm business income from their home-grown inputs (landraces) was still positive. Therefore, farmers grew rice landraces and made maximal use of their own inputs. If they did not use landraces, their own inputs had no or very little alternative uses. Thus, these traditional varieties enhanced the value of farmers’ own resources. Further, these local varieties have their own cultural importance. For instance, Anadhi was used in special festivals for making ‘latte’ (rice made with large amount of ghee) because it absorbs ghee during cooking. Due to their unique characteristics, such rice varieties are highly demanded by consumers and farmers therefore continue to cultivate them. Farmers’ rationale in maintaining traditional varieties need to be further examined so that effective partnership programmes (that can enhance the productive capacity of farmers’ landraces, improve farm income and ensure the continuous survival of traditional rice varieties) can be developed.

Seed procurement, storage and sales of local rice varieties

The sources of seed, its acquisition and replacement systems differ from farm to farm. In Begnas, about 93 per cent of farmers retained their own rice seed for next year planting. About 5 per cent of farmers received seeds from neighbouring farmers and only about 2 per cent of farmers obtained seeds from development organizations (NGOs, cooperatives, seed-selling enterprise, etc.).

The farmers were asked where they sell seed paddy. About 73 per cent of them reported that they sold it to their neighbours, not for money but in exchange for paddy. The prices for seeds are not different as the rice for seed is not produced differently. In the previous year, only 20 per cent of the respondents sold seeds to the cooperatives and NGOs. The cooperatives and NGOs were reported to occasionally visit villages to buy seeds.
Table 6.1 List of own and purchased inputs and derivatives of incomes from different local rice varieties

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Seed</th>
<th>Farm yard manure</th>
<th>Labour</th>
<th>Bullock</th>
<th>Total cost of own inputs</th>
<th>Inorganic fertilizer</th>
<th>Bullock</th>
<th>Labour</th>
<th>Total cost of purchased inputs</th>
<th>Total cost</th>
<th>Gross income</th>
<th>Net income</th>
<th>Farm business income</th>
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<tr>
<td>Anadhi</td>
<td>Mean</td>
<td>67.5</td>
<td>173.8</td>
<td>1117.5</td>
<td>1446.25</td>
<td>66.5</td>
<td>193.8</td>
<td>900.00</td>
<td>1160.25</td>
<td>2606.50</td>
<td>2968.75</td>
<td>362.25</td>
<td>1808.50</td>
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<td></td>
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<td>105.0</td>
<td>9265</td>
<td>81.9</td>
<td>229.5</td>
<td>483.05</td>
<td>473.72</td>
<td>1327.99</td>
<td>952.05</td>
<td>2264.84</td>
<td>1389.97</td>
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<td>Anga</td>
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<td>55.0</td>
<td>200.0</td>
<td>900.00</td>
<td>15500</td>
<td>131.0</td>
<td>131.2</td>
<td>1645.83</td>
<td>1777.00</td>
<td>3087.00</td>
<td>2433.33</td>
<td>-65.37</td>
<td>656.33</td>
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<td></td>
<td>SD</td>
<td>7.07</td>
<td>70.71</td>
<td>636.40</td>
<td>70.75</td>
<td>551.54</td>
<td>77.55</td>
<td>206.24</td>
<td>128.69</td>
<td>422.85</td>
<td>329.98</td>
<td>752.83</td>
<td>201.29</td>
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<td>Bayarni Jhinuwa</td>
<td>Mean</td>
<td>70.0</td>
<td>225.0</td>
<td>1140.0</td>
<td>2640</td>
<td>1699.0</td>
<td>862.5</td>
<td>862.5</td>
<td>2561.5</td>
<td>3300.00</td>
<td>738.50</td>
<td>2437.50</td>
<td>210.29</td>
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<td></td>
<td>SD</td>
<td>0.00</td>
<td>106.1</td>
<td>84.85</td>
<td>8.49</td>
<td>199.40</td>
<td>371.23</td>
<td>371.23</td>
<td>570.64</td>
<td>424.26</td>
<td>994.99</td>
<td>795.50</td>
<td>299.0</td>
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<td>Chotte</td>
<td>Mean</td>
<td>55.6</td>
<td>179.2</td>
<td>765.8</td>
<td>199.17</td>
<td>1199.7</td>
<td>118.8</td>
<td>1377.78</td>
<td>1457.0</td>
<td>2656.70</td>
<td>2594.4</td>
<td>-62.28</td>
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<td>26.02</td>
<td>444.13</td>
<td>65.78</td>
<td>500.97</td>
<td>27.11</td>
<td>302.46</td>
<td>281.23</td>
<td>721.16</td>
<td>356.03</td>
<td>419.77</td>
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<td>Ekle</td>
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<td>275.84</td>
<td>11383</td>
<td>631.33</td>
<td>32.67</td>
<td>235.8</td>
<td>1059.83</td>
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<td>68.91</td>
<td>220.72</td>
<td>56.58</td>
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<td>406.93</td>
<td>551.12</td>
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<td>Jetho Budo</td>
<td>Mean</td>
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<td>306.3</td>
<td>515.89</td>
<td>10550</td>
<td>998.26</td>
<td>131.0</td>
<td>222.1</td>
<td>1680.11</td>
<td>2033.21</td>
<td>3031.47</td>
<td>442.43</td>
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<td>11.5</td>
<td>209.5</td>
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<td>49.38</td>
<td>207.42</td>
<td>227.3</td>
<td>99.74</td>
<td>822.61</td>
<td>954.59</td>
<td>1065.31</td>
<td>661.19</td>
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<td>Local Mansuli</td>
<td>Mean</td>
<td>58.9</td>
<td>290.4</td>
<td>375.0</td>
<td>0.00</td>
<td>724.29</td>
<td>387.2</td>
<td>342.0</td>
<td>2562.50</td>
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<td>116.4</td>
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<td>441.94</td>
<td>516.69</td>
<td>765.19</td>
<td>151.52</td>
<td>668.22</td>
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<tr>
<td>Mansara</td>
<td>Mean</td>
<td>54.0</td>
<td>182.5</td>
<td>820.50</td>
<td>1620</td>
<td>12140</td>
<td>35.0</td>
<td>1282.5</td>
<td>1472.3</td>
<td>2691.3</td>
<td>2360.0</td>
<td>-331.3</td>
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<td>72.67</td>
<td>402.62</td>
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<td>122.5</td>
<td>186.8</td>
<td>495.57</td>
<td>657.82</td>
<td>81.63</td>
<td>357.77</td>
<td>753.99</td>
</tr>
</tbody>
</table>

Notes: 1 hectare = 19.66 ropani; US$1 = NPR 64.45 on 6 April 2008; SD = Standard deviation.
Source: 2006 household survey, Nepal
The price of rice landraces was, as expected, found to be different across seasons. The price of rice was found to be lower shortly after the harvest than after 12 months of harvesting. Consumers preferred one-year-old rice (for its desirable consumption traits) to newly harvested rice which is part of the reason for the price variation. During the harvesting season, both the one-year-old rice and the newly harvested rice are sold side by side but at different prices. The percentage difference in prices during harvest time and the later period was higher for paddy than for the milled rice. The difference for paddy ranged from 17 per cent to 30 per cent whereas in the case of milled rice the difference ranged from 1.2 per cent to 26 per cent. Table 6.2 reports the price differences during harvest and 12 months after the harvest.

Traditional farmers depend on the farm production for their food security and income. To achieve their household food security, the farmers attempted to grow high-yielding varieties, with the consequence that farmers more often chose to cultivate modern varieties, pushing the low-yielding landraces to the verge of extinction. At the same time, some better-off farmers wanted to meet their socio-cultural needs by growing landraces with unique properties. Farmers always seemed to face trade-offs between high yield and preserving their unique culture and taste. Commercialization of the landraces and increased income from them seemed to attract farmers towards the landraces, thereby contributing to their conservation.

### Marketing channel

A marketing channel is the path through which the commodity flows via different traders from producers to consumers. As far as the marketing channel of rice seeds is concerned, farmers can be considered producers and also consumers. In Nepal and in many other developing countries, seed distribution systems,
particularly for local producers, are mostly based on barter through exchange among neighbouring farmers.

Agricultural products were reported to pass through different functionaries/channels involving various economic actors before reaching the final consumers. In the case of the present study area, such actors include collectors/vendors, processors, group suppliers, wholesalers and retailers. In general, producers sold their paddy to traders or local millers. In some cases, the cooperatives were working in seed marketing. Cooperatives were reported to buy seeds from farmers and resell to other farmers. The general system of marketing of local paddy cultivars in Nepal is depicted in Figure 6.1.

**Commercialization and marketing of local crop varieties**

The number of consumers buying local products from local stores and wholesalers ranged from 5 to 500 per week in Kathmandu Valley. These products were bought for their medicinal value and because foreigners were attracted towards these indigenous products. Due to availability of market demand, most of the stores expressed an interest to deal with these products. They also noted that export markets of such products are India, Japan, Israel and the USA.

**The prospects for promoting value addition enterprises**

According to the retailers, local people were the main consumers of the local rice products. At the same time, many foreigners were also reported to have been consuming local products. The study suggests possibilities of promoting value addition enterprises for some of the selected local crop varieties. Obviously, with enhancement of such enterprises, farmers might be willing to participate in maintaining the diversity of the species.

**Price margins for sellers**

Price margin is defined as the difference between the price paid by the consumers and the buying price of the sellers. In this study, the price margin of sellers was calculated on the basis of the purchasing and selling prices of the sellers.

In the case of certain items such as maseura, perilla, sesame and rice bean, the wholesale and retail prices were reported to be the same. This is mainly because in many cases the retailers are also the producing entrepreneurs who are also the sellers to other sellers such as department stores. This shows a small-channel and emerging nature of the markets of these species.

The price margin for selected department stores often varied, i.e. NPR 2 (10 per cent price margin) for gundruk to NPR10 (30 per cent) for soybean per kg. In the case of retailers, it varied from NPR 2 (5 per cent) to NPR 20 (75 per cent) for perilla, cowpea, timur and jimmu. The other secondary sellers also share the margin (the difference between selling and buying price) from NPR 5 (33 per cent) to NPR 20 (40 per cent). Prima facie, there were several possibilities of promoting the marketing of local varieties of crops and their products. However, the pricing structure and analysis of the enterprise establishment need further research, incentives and policy measures for promising public-private partnerships to be devised.

**Conclusions and implications for policy**

Promoting the commercial use of traditional varieties of crops and marketing their products is one of the important approaches for utilizing, enhancing and
conserving crop genetic resources. This can support the sustainable development of agriculture in two ways:

1. by improving farmers’ incomes/livelihoods; and
2. by ensuring the conservation of these resources on-farm.

To augment these objectives, farmers should be provided with appropriate technologies that help reduce the production cost to get higher benefit from the local rice varieties. Small industries or micro-enterprises based on products of traditional crop varieties (landraces) should be established on a participatory basis.

Net incomes for some traditional varieties were found to be negative; they were less preferred and grown on small areas. However, the growers of these and most of the other local varieties of rice earn positive farm business income. By utilizing their own farm-grown resources, which often do not have other alternative markets, rice producers managed to gain benefit and enhance the productivity of underutilized traditional varieties. This is why farmers are growing rice landraces in spite of the net loss in net farm income. Moreover, retaining traditional varieties by traditional farmers may also be explained by their better resonance, better resilience to local households, increased immunity to higher market fluctuations, and better protection against vagaries of nature – factors contributing to the livelihoods and household economics of local farmers.

The local species that are not producing positive net farm income may be discarded by farmers in the long term, especially when access to improved varieties and other inputs increases. However, varieties with important traits should be conserved for breeding purposes through additional public efforts, which will be more successful if they are linked to the livelihoods of rural communities.

Scented rice varieties like Jetho Budo have high values for consumers. Thus, a programme of development of aromatic rice needs to be implemented with the active participation of farmers. A consolidated network of production, processing, marketing and consumption of aromatic rice could be launched. Expansion of market linkages with the promotion of enterprises for value addition and marketing activities for local varieties (plus their products) should be carried out (ABTRACO, 2007). The values and importance of the products of local rice varieties in generating incomes and employment for the local entrepreneurs should be recognized. Further research on nutritional values, product design, processing and attractive packaging of the local products needs to be undertaken.2
Notes

1 NPR is Nepalese rupee. Ropani is a unit of land which is approximately 507.8m².
2 This study was sponsored by Bioversity International and was conducted by ABTRACO. The authors duly acknowledge the support of Bioversity and the comments and inputs of all editors and the GRPI team, especially the unlimited technical and editorial inputs provided by Dr Edilegnaw Wale.

References