

Contracts for 'Compensating' Creativity: Framework for Rewarding Grassroot Creativity and Innovation

**P.G. Vijaya Sherry Chand*,
Kirit K. Patel, S. Murali
Krishna and Anil K. Gupta**

*Vice President

Society for Research and Initiatives
for Sustainable Technologies and
Institutions – SRISTI,
Ahmedabad, India

Abstract

This paper deals with an important dimension of sustainable development, a system of rewards and incentives which is based on the principle that conserving biological diversity is possible only when the associated knowledge systems are rewarded. It begins with a critique of the term compensation and then presents a framework of rewards that would ensure building up of capabilities and capacities among local communities and individuals; and in the process, lead to democratic and reciprocal systems of exchange between different cultures, societies and economies. More specifically, the paper deals with the operationalisation of one dimension of the framework: generating material rewards through commercialisation of innovations based on natural products. It focuses on the formalisation of reciprocal exchanges through a system of primary registration of innovations, and contractual arrangements involving local innovators, intermediary agencies, research and development organisations, and commercial organisations. Pro-forma agreements are presented and their implications discussed.

Towards a Reinterpretation of Compensation

The Convention on Biological Diversity (CBD), by shifting the interpretation of biodiversity's proprietary status from a "common global heritage" towards property subject to national sovereignty enables states to control access through mutually-agreed terms and prior informed consent, and to claim equitable compensation. Article 8j of the CBD provides for states to take steps to decentralise this principle, so that individuals and specific communities embodying traditional lifestyles do not get subsumed under national aggregations. At another level, revised national intellectual property protection laws under the sub-agreement relating to Trade Related Aspects of Intellectual Property Rights (TRIPS) may help in ensuring rewards to grassroots innovators. However, doubts have been expressed about the feasibility of recognising, and extending protection to traditional knowledge under current intellectual property laws (Axt *et al.* 1993).

A third development, primarily in the field of biodiversity prospecting is the effort to combine indigenous peoples' tangible rights over natural resources with compensation for their knowledge which, by identifying promising plants helps prospectors reduce their own transaction costs.

The term "indigenous" has been used in the specific context of post-colonialism to denote communities usually racially distinctive, which were the original inhabitants of a geographical territory at the time of European colonisation. In some cases, decolonisation led to the transfer of power, not to these communities, but to the descendants of the original colonisers, e.g. South Africa. Thus, "indigenous populations" emerged as an alternative to "indigenous peoples" for describing the mix of communities that occupies a territory in the post-colonial context. "Indigenous peoples" usually implies a latent right of political self-determination; in addition, it is linked to the issues of rights and control related to land and natural resources in territories traditionally occupied by indigenous peoples and to cultural self-determination. This paper prefers the term "local communities" to refer to the socio-cultural entities that have been dependent, to varying degrees on natural resources. These entities include, in the Indian context, various forest-dependent tribal communities. There is no doubt that the latter communities constitute some of the most deprived sections of society and that they have been victims of processes of marginalisation, initiated not just as a result of colonial policies, e.g. forest-related laws, but also by local economic interests as in appropriation of land. It should be noted that these local communities have a mosaic of systems of rights and obligations, in both the communal and the private domains. It is a different matter that such systems or regimes may not be recognised or appreciated by external agents.

Various forms of contracts have been developed. For instance, the University of Arizona's collaboration with institutions in South America seeks to screen plant extracts to which the latter have access. The International Co-operative Biodiversity Group's arrangement with the Council of Aguaruna and Huambisa, Peru for the collection of plant samples and screening is an advance in that concrete mechanisms for sharing of compensation with indigenous organisations have been specified. Putterman (1996) offers model material transfer agreements which may be used as a framework by source and receiver countries for working out specific arrangements between resource providers from biodiversity-rich countries and receivers, commercial and non-commercial organisations of the industrialised world.

These arrangements have rightly focused attention on the issue of compensation to the providers of the raw material that derives from the natural resources to which the providers have access. However, most of them are premised on a particular and very crucial understanding of provider societies.

This understanding which has its historical roots in the enlightenment conceptualises the "self" in this case the North, in terms of the various forms of liberal individualism, and the "other" in social or community terms. Thus, the "self" is underpinned by rights which are legally-recognised claims attached to legal subjects, individual citizens or legal personalities. On the other hand, the "other" which relies on "traditional" and communally owned or accessed property and on knowledge claims which derive from "tradition" may not be legally recognised, and thus may not qualify as "rights". This approach may be attributed to an inability to appreciate the dynamics of the systems of ethics, rights, responsibilities and obligations within provider societies. But it has certain consequences for the way in which the issue of compensation has been hitherto discussed.

The indigenous communities and individuals who comprise them have not been generally conceptualised as active agents, whose interests and abilities may extend beyond just providing material for screening elsewhere and in return undertaking community development work. Capabilities concerning scientific exploitation of natural resources and legal negotiations may not exist at present, but a recognition of an agency function in provider groups is a necessary step for building in capacity-development initiatives, including technology transfer and local entrepreneurial activities.

Traditional knowledge is supposed to be characterised by the fact that it has been handed down for generations within the indigenous community (Axt *et al.* 1993). This position disregards the process of reconstitution of knowledge dur-

ing its reproduction and transmission. In other words, inventiveness is a quality which, according to this conception would seem to be absent in the perceivable forms of "traditional knowledge".

A corollary of the above is that the role of individuals in improving, adding value to, modifying practices which may have their origins in the distant past is discounted. Thus, the term unimproved varieties gains currency even when it can be reasonably assumed that individual agriculturists have undertaken a process of selection and trials in order to evolve such varieties. In effect, the approach precludes recognition or rewards to such individuals.

A more serious consequence is the conceptual split between material resources and knowledge with the assumption being that "knowledge" resides in the receivers, and material with the providers. It should be realised that "knowledge" of a particular kind, for instance biotechnology cannot substitute for knowledge which reside in all communities. Not doing so has resulted in a devaluation of those knowledge systems which have been active in the conservation, management and development of natural resources. In other words, the claims are assumed to be associated with only the natural resources, thus making them eligible for compensation commensurate with the value of the samples and/or anticipated returns from commercialisation. Sometimes even this principle is not followed, even though the days of "biopiracy" may be over. For instance, in the first draft of Indian Plant Varieties Act of 1993 it was not mandatory for breeders or other users of germplasm preserved by local communities to pay any royalty to the providers. The provision of benefits was left to the discretion of the prospectors. This example is indicative of the existence of a pattern of unequal relationships between local communities and external agencies, not just in the international context, but also within national contexts. In other words, the state may not always guarantee the protection of rights of local innovators or communities. Any attempts at sustainable development must valorise local knowledge associated with conservation, aim at building up the capacities of the holders of such knowledge and recognise the prerogative of the individuals or communities to share on their terms the material and associated knowledge with external agents. Such an understanding of the broad issue of compensation for the tangible property, natural resources in a modified form or otherwise, the associated intellectual property, knowledge of individuals as well as of communities, underpins the various initiatives of Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI) in this regard.

Framework for Rewards and Incentives

The operationalisation of the understanding of “compensation” outlined above implies attention to the following three aspects (Gupta, 1989, Gupta, 1990, Gupta, 1991; Gupta *et al.*, 1995; Patel *et al.*, 1996): (i) recognition of the creativity and innovativeness of individuals and collectives through a system of documentation and registration, thus establishing the issues of who should receive compensation and why; (ii) generation of reward and incentive models for different types of knowledge and for different types of skills; (iii) generation of monetary and non-monetary rewards and incentives for local innovations at both the individual and collective level.

These three aspects and the issues they raise are discussed below. It should be noted that each aspect assumes attention to building capacities and capabilities of local communities.

Recognition of the Creativity and Innovativeness

As noted earlier, the knowledge systems of local communities have been dynamic enough to permit incremental modifications and adaptations of those practices which may be considered “traditional”. Sometimes, such knowledge has been protected through processes akin to the modern system of trade secrets. For instance, there are many instances of experts within local communities continuing to attach secrecy to unique knowledge in their possession. On the other hand, there are also many instances of local communities offering their knowledge to outsiders, often without any expectations of rewards. The documentation and publication of such knowledge has the potential for promoting lateral learning among people who are struggling with problems that can be solved by such knowledge.

Publication of the knowledge, however, has the potential to exhaust the intellectual property rights of the innovators by bringing the knowledge into the public domain. In order to resolve this dilemma, SRISTI has adopted a three-pronged strategy:

- dissemination of practices in a synoptic form
- concurrent research on value addition
- initiation of a system of registration of local innovations which will prevent third parties from seeking to derive benefits from registered innovations without some form of licensing

Efforts are being made to formalise the system of registration described below. The benefits of such a registration system are the following:

- Individual and collective creativity is acknowledged.
- Assurances to local innovators are provided regarding a share in the benefits that may arise from commercial application of their knowledge in the form in which it was registered or in a value-added form.
- Linkages between innovations, investments and enterprises are facilitated by reducing the transaction costs of small-scale investors and grassroots innovators. At the same time, it can facilitate the process of novelty searching. The World Intellectual Property Rights Organisation offers complimentary help to third world innovators; however, it has been handling only about 600 cases every year in the recent past. In any case, the issue of access to novelty searching processes would remain in the absence of the registration system.
- The registration system would make it possible to create an autonomous authority for scrutinising any contracts that may be based on the registered practices and for supervising extraction of natural resources to see that principles of renewability are being followed.
- The contextual information pertaining to any registered practice or innovation, which can be updated periodically will help in connecting communities facing similar ecological situations.
- The registration can be extended to the award of inventors' certificates or petty patents that allow protection for specific purposes, for a limited period of time. Such mechanisms can also help in gaining access to preferential credit and risk cover in order to facilitate the transition towards value addition.
- The registration system can be part of a Knowledge Network (Gupta 1995) that can promote people-to-people learning and serve as a multi-language, multi-level, multi-media, clearing house for local communities.

In effect, registration in the names of individuals or associations of local communities should award the registered practices right of precedence in matters of filing of applications for protection of intellectual property and exclude others from filing patent applications on the basis of the registered practices. Several patent offices have been approached with a view to exploring the feasi-

bility of getting formal recognition for such a registration system. The system will be particularly effective in extending protection to practices which involve wild plants that perform specific functions in domestic agriculture, e.g., green manuring, herbal pesticides, veterinary medicine, stress feeds, anti-oxidants. This aspect of biodiversity is neglected by the Plant Variety Act and UPOV. Also, it will enable protection of heterogeneous populations of many cross-pollinated and multi-line, self-pollinated land races since breeders' rights are granted only for varieties which are distinguishable by one or more characteristics which are stable and homogeneous. The heterogeneous varieties are likely to have greater value in terms of genetic material resistant to pests and diseases. Protection of such plant-based practices through registration will also pre-empt applications in countries which allow patenting of plant forms. To conclude, establishment of a registration system can be a precursor to extending more concrete intellectual property rights through patents for instance, to local communities and individuals.

Generation of Reward and Incentive Models for Different Types of Knowledge and Skills

Specific attention has to be paid to conservation of knowledge since conservation of biodiversity is inextricably linked with associated knowledge systems. For instance, classificatory knowledge relies for its existence on diversity in nature. Documentation of local taxonomies and identification of local taxonomists would be of help in conserving the local diversity. Eco-indicators constitute an important part of associative knowledge since they act as early warning signals of desirable or undesirable natural events. They also help in co-ordinating the strategies of people competing for the same resource niche. For instance, in Bhutan, the flowering of Tseb plants indicates to the yak herders that it is time for them to go back to higher altitudes so that cattle herders coming up from the plains do not meet the yak herds. This prevents transmission of diseases and also gives the pastures time to regenerate. Herders, far apart are able to co-ordinate their movements over time and space without the help of sophisticated equipment (Gupta and Ura, 1992).

In practice, the application of knowledge is manifested in the form of skills. Providing incentives for the augmentation of skills is another route to the conservation of underlying knowledge. Very often, people combine repetitive skills in one sphere of their activity with judgmental skills in another. For instance, Karimbhai Sumera in Gujarat is an outstanding herbalist who provides his services at no cost. He earns his livelihood through pottery, which involves repetitive skills. Incentives for pottery through technology, new materials, de-

sign or access to markets may help to reinforce the ecological ethics underlying free dispensation of herbal medicine.

Table 1. Incentives for different types of knowledge

No.	Knowledge type	Incentives
1	Discriminatory/ classificatory	Soil maps, trees in local taxonomies; data banks that are accessible to the local innovators or conservators in the local language; gene banks which serve as safe deposit vaults for the farmers conserving germplasm in situ; local herbaria and museums that are linked to local ecological and taxonomic systems; botanical and medicinal gardens in schools or common property lands; employment for local taxonomists
2	Attributional	Biodiversity competitions among children; providing scholarships to little eco-geniuses who wish to become naturalists; inviting local experts to school to impart observational skills; compensation for ethno-botanical knowledge provided to outsiders
3	Associative	Documentation of eco-indicators, some of which may be used as early warning signals
4	Causal	Using causal knowledge of local experts as vital inputs in projects for restoration of ecological balance, reclamation of degraded lands; grassroots environmental health monitoring units managed by local communities
5	Functional	Adding value to functional knowledge by converting it into technology and/or discovering the science behind it; strengthening local capacity to carry out on-farm experiments; creating community laboratories or research farms managed by creative communities; venture capital grants
6	Heuristics	Congregational: getting them together; compensating local innovators when scientists use their heuristics to make new discoveries; travelling seminars of local experts; narrative-metaphorical learning stimulated through small and large group interactions
7	Knowledge about limits/ boundaries	Consulting local experts while targeting new technology, conserving specific species or habitat since these experts have knowledge about ecological niches
8	Systematic linkages	Consulting local experts during ecological crises; conserving linkage between sacred and secular

Source: Gupta (1996)

The incentives for judgmental skills such as judging local cattle and predicting rains would be different. Providing incentives to local experts to take on apprentices or mentoring roles may be effective. Restorative skills may involve integration of knowledge of causal relations, associative knowledge, functional knowledge as well as knowledge of system linkages. The Kutchi Patel community is known for its expertise in reclaiming marginal soils for agriculture. Members of this community have been observed to buy marginal land at low prices, work on it for about five to ten years in order to restore soil health, and then sell it at a premium. As of now the only incentive they have is the price incentive. Their expertise, however, can be used in the design and implementation of land improvement schemes of the land development corporations and similar agencies.

Documentation and exchange of such knowledge would serve as incentives for conservation and for developing mechanisms for regulation of collective behaviour. A matching of various incentives with the different dimensions of knowledge is presented in Table 1.

Conservation or augmentative skills may be repetitive or judgmental. These may often be associated with culture and institutions. Hence conserving eco-ethics in this case becomes as important as conserving the skill itself. These four kinds of skills and some applicable incentives are listed in Table 2.

Table 2. Incentives for conserving knowledge in practice

No.	Type of skill	Incentives
1	Repetitive	Vocational training centres; community workshops which can serve as arenas for exchange of skills; new materials, designs or access to new markets; conserving cultural institutions that help generate regularity in patterns
2	Judgmental	Apprenticeship; mentoring; manuals to aid learning; audio-visual aids; clearing house for unique case discussions; providing regional, national and international opportunities to local experts for participating in such case clinics and conferences
3	Conservation/Augmentation	Community incentives for CPR structures; strengthening eco-ethics of individuals; demonstration of economic gains; travelling seminars
4	Restoration	Removing market imperfections or distortions so that prices reflect the real value after restoration of resource to original levels of productivity; engaging experts as local consultants and trainers for government schemes

Source: Gupta (1996)

Generation of Monetary and Non-monetary Rewards and Incentives for Local Innovations at Both the Individual and Collective Level

Having considered the need for focusing specifically on reward systems for knowledge associated with conserving biodiversity, it is necessary to turn to specific forms of fair and just returns for local innovations. According to Gupta (1995), a 2x2 framework for generating rewards for innovations can be developed along two dimensions:

- nature of compensation either material or non-material
- the receiver of compensation either individual or community

Thus, four combinations are possible which are presented in Table 3. It should be noted that some of these may overlap with the incentives described earlier for rewarding knowledge.

Table 3. Rewards and incentives for innovations

<p>Individual-material</p> <p>Protection of property rights (patents, registration scheme); user fees; awards, fellowships, research grants; voluntary contributions from users and civil society; pension schemes; allotment of land and resources needed for further experimentation and innovation</p>
<p>Individual-non-material</p> <p>Documentation, coverage in press, TV and other media; public felicitation, e. g. doctorate from formal research, institution; invitation to lecture in schools, centres of learning and research, conferences, workshops; attaching name of innovator to the innovation; local titles, such as "Krishi Sant" for Bhaskar Save, one of the pioneers of natural farming in Gujarat; national titles, such as Krishi Pandit, Padma Sri, Membership of Parliament, Expert Committees on Resource Use; photographs being placed in Gram and Taluka Panchayats; access to new skills</p>
<p>Community-material</p> <p>Venture capital or Risk funds; trust funds; priority in the development of infrastructure, e.g. schools, health care system, access roads etc.; free or easy access to data banks; access to external expertise; community awards; external aid in developing CPRs; marketing intervention for organic produce</p>
<p>Community-non-material</p> <p>Greater control over local natural resources; removal of perverse incentives for conservation; favourable policy environment for eco-friendly products; favourable policy environment for conservation practices; recognition to community: media attention, community awards; greater negotiation skills; capacity building through transfer of technology</p>

Source: Gupta (1996)

Enhancing Capacities and Capabilities of Local Communities by Building and Formalising Reciprocal Relationships with External Agents

This section illustrates the above framework and discusses SRISTI's efforts to strengthen reciprocal relationships among local innovators, research organisations and commercial organisations. Thus, the focus is on material rewards to local innovators and communities through commercialisation of ideas and innovations. Aspects of SRISTI's work related to the other elements of the framework are presented in SRISTI (1996).

A general framework depicting the flow of material, stages at which intellectual property is created, stages at which rewards to local innovators arise and the flow of such rewards is presented in Figure 1. Two sets of issues arise in relation to the different aspects of Figure 1. These are:

- role of intermediary organisations in building partnerships with local innovators
- second level of partnership: Research and commercial organisations

Role of Intermediary Organisations in Building Partnerships with Local Innovators

The first issue, given current realities is the need for an intermediary organisation to take the initiative for setting up schemes of rewards and incentives. The initial role played by SRISTI, through the Honey Bee Network in the process of documentation (SRISTI 1996) has been fundamental in the development of a database that now has 5,376 innovations. Protection of these innovations through a primary Registration System, as noted earlier will help in more concrete intellectual property protection in the future. Some of the issues which will be mentioned hereafter.

The up-front investments needed to generate and maintain the system of registration, and the transaction costs are sizeable. Perhaps global conventions and funds have a positive role to play in supporting such initiatives, thus enabling themselves to engage in people-to-people networking. This capacity building role also implies high *ex-ante* costs, in that negotiations have to be undertaken with local communities and innovators and risk assurances provided. Such investments, however, will make the implementation of agreements easier.

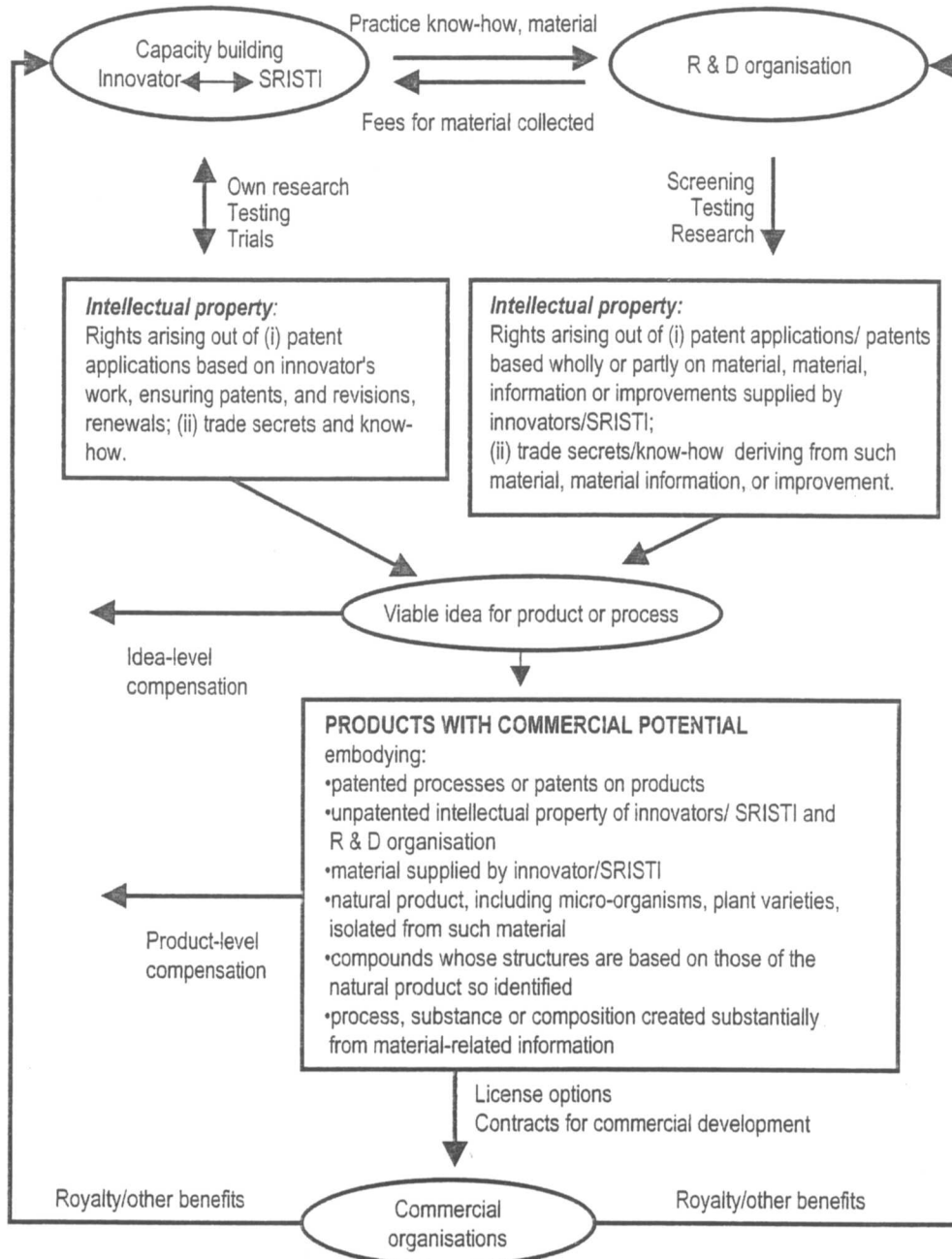


Figure 1. Flows of material, knowledge and rewards

The model adopted here is one in which SRISTI is an intermediary between a large number of individuals or communities and external agencies such as commercial organisations. Initially at least, it may not be possible for local individuals to directly enter into partnerships with commercial agencies though this would be the ideal arrangement. In other words, SRISTI has two sets of contractual arrangements, one with local innovators and the other with commercial or research organisations. Extra care is needed to see that these two arrangements do not conflict with each other as far as fundamental purposes are concerned. It should be ensured that asymmetrical relationships are avoided. This is perhaps best done by setting up a local authority made up mostly of local people to act as a depository for contracts and as a monitoring agency. A capacity-building role also implies that intermediary organisations remain alive to the possibility of creating new resource markets, for instance through microbial diversity.

An important concern related to the Registration System is the question of establishing the proprietary status of innovations beyond doubt. When a new innovation is recorded, its newness is established by a reasonable search. What constitutes a reasonable search may be open to question, since it may so happen that an innovation may turn out to have been evolved beyond doubt by another innovator prior to the recorded innovation. Thus an ethical dilemma concerning the rights of a first-recorded innovator and discoverer of a practice is possible in some cases. A suitably-worded public announcement may help in establishing the ownership of the innovation clearly. A second option is the introduction of a liability clause in the agreement that SRISTI enters into with local communities or innovators.

Second Level of Partnerships: Research and Commercial Organisations

An important initial process is the clarification of goals and mutual expectations, carried out in an atmosphere of trust. Since this level of arrangements is aimed at generating monetary rewards, clarity about (i) the various stages of product development at which possible benefits may arise; (ii) the different types of intellectual property that may arise at these stages; (iii) the kinds of protection possible, given the current restrictions on product patents under Indian law will help in arriving at reasonable, mutually-acceptable agreements. Also, since experience with such contractual arrangements is fairly limited there should be scope for renegotiating any arrangement at the various stages at which benefits arise.

With regard to sharing of benefits, rewards may be presumed to fall due at four stages: (i) when material is accessed; (ii) when a discovery or an idea with

potential is identified; (iii) when a product prototype is developed; (iv) when the product is commercialised and benefits are derived (Pew Scholars, 1994).

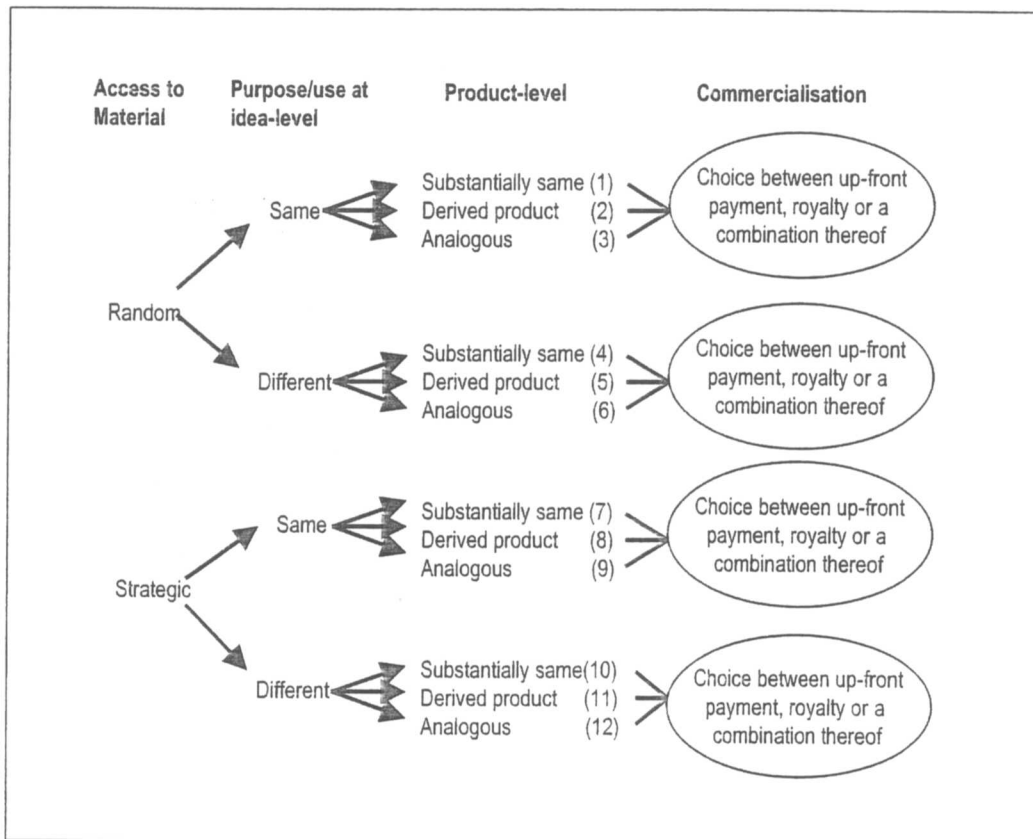


Figure 2. Criteria for determining quantum and shares of rewards

Figure 2 will help in the visualisation of the criteria that may be used to determine (i) the quantum of reward, (ii) the weightage that needs to be given to the material accessed *per se* and to the associated knowledge systems and (iii) the proportions of the reward that would be appropriate for those who provide the innovation and for those who add value to the innovation. The combinations indicated in Figure 2 have different implications for the quantum of rewards and the sharing of such rewards. In general, a random access allows screening of material by external agencies and would imply lower returns to the people with

access rights. Strategic access, on the other hand implies a clearly associated knowledge system that reduces the transaction costs of prospectors. Thus, there is a case for higher returns, primarily for the knowledge component.

At the level of the idea, a use identical with that reported with the material would qualify for a higher return to the local innovator. A different use developed by the value-adder would reduce the proportion due to the innovator. Likewise, derived products and analogous would increase the share of the researcher. In other words, route 7 where the material is accessed on the basis of strategic knowledge provided by the innovator, the idea has the same use as originally proposed by the innovator and the product is substantially the same as that derived by the innovator which implies the highest return to the innovator. Conversely, route 6 would imply the lowest share of the innovator. With regard to benefits at the stage of commercialisation not every process or product will lend itself to commercialisation. The choices at this stage would depend on the market potential, the returns expected, export possibilities and the future collaborations envisaged between the intermediary and research organisation on the one hand and the commercial organisation on the other.

A crucial trade-off is between up-front or immediate payment and deferred compensation through a system of sale-linked royalties. This will also depend on the participation of the commercial organisation in making the product marketable. For instance, in the case under discussion even though the products are in an advanced stage of formulation and the market possibilities can be estimated reasonably accurately, they do need some contribution from the commercial organisation prior to marketing. Thus, a combination of up-front payments to guarantee against the failure of the final stages of preparation of the product and royalty payments for a specified period has been preferred.

Rates of royalty in similar commercial transactions range from three to five percent of net sales. Thus, it is possible to estimate the total quantum of rewards that are likely. The period over which such payments become due can be possibly linked with the duration of any patents that may cover the product. In cases where the product is not covered by any patent, thereby implying a higher risk associated with the product the duration of royalty may be shortened to ten years. It is also possible that at a later stage of re-negotiation the commercial organisation may prefer to add an incentive to the royalty payment in return for first rights to future products to be developed by the intermediary and research organisation.

Regular reporting and monitoring mechanisms need to be instituted to make disclosures about sales and royalties due. Other more general issues relate to

material being researched. The positions taken in the case under discussion with regard to the material supplied for research purposes are as follows. Firstly, material information will be supplied since it will help the research organisation. A relationship of trust is assumed. It is possible that there may be situations in which only coded samples may have to be supplied. The second point is that an exclusive right for a specified period for screening and research needs to be specified. Finally, ownership of material remaining after the research has to be specified, since such material may be re-researched in the future. In the present case, ownership of unused material lies with SRISTI.

Conclusions

This paper has dealt with an important dimension of sustainable development: developing a system of incentives and rewards which assumes that conserving biological diversity is possible only while rewarding and conserving the associated knowledge systems. It started with a critique of the term “compensation” and then argued for a broader framework of rewards that would ensure building up of capabilities and capacities among local communities and individuals and in the process lead to democratic and reciprocal systems of exchange between different cultures, societies and economies. This process of humanisation is at the core of bringing about sustainable development.

The paper has discussed in more detail one dimension of SRISTI’s attempts to operationalise the framework presented: generating material rewards through commercialisation of natural product based innovations. Such a process may be best achieved through formalisation of reciprocal exchanges through a system of primary registration of innovations and contractual arrangements involving local innovators, intermediary agencies, research and development organisations, and commercial organisations. The initial steps taken in this direction have been reported; how the implementation of these arrangements proceeds will determine the strength and potential of such reciprocal exchanges.

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