The International Treaty
ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Item 3 of the Provisional Agenda

SECOND MEETING OF THE AD-HOC OPEN-ENDED WORKING GROUP TO ENHANCE THE FUNCTIONING OF THE MULTILATERAL SYSTEM

Geneva, Switzerland, 9-11 December 2014

SYNOPTIC STUDY 1: ESTIMATING INCOME TO BE EXPECTED FROM POSSIBLE CHANGES IN THE PROVISIONS GOVERNING THE FUNCTIONING OF THE MULTILATERAL SYSTEM

Note by the Secretary

EXECUTIVE SUMMARY

This is one of four short, strategic, preliminary studies that the Governing Body requested the Secretariat to prepare, in support of the *Ad Hoc* Open-ended Working Group to Enhance the Functioning of the Multilateral System. Its primary focus is economic analysis, to evaluate the potential of possible revisions to SMTA Articles 6.7 and 6.11 to ensure sustainable and predictable income to the Benefit-sharing Fund.

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I. INTRODUCTION

1. The present document is one of the studies requested by the Governing Body, when it established the Open-ended Working Group. It addresses economic matters that the Working Group may need to take into account, in considering the possible revision of the SMTA.

2. It draws on the Background Study, *Estimating income to be expected from possible changes in the provisions governing the functioning of the Multilateral System*, which was prepared by a team of consultants.[1] It builds upon, and further develops, the analysis presented in the document, *Background on the work undertaken by the* Ad Hoc *Advisory Committee on the Funding Strategy, and its further development*,[2] which the Working Group considered in its first meeting in May 2014.

3. This study is not intended to be prescriptive, or to make recommendations on the decisions that the Governing Body will need to take, but aims to provide data and technical analysis that may help identify both problems and opportunities, and so support the Working Group in its task.

II AIMS AND OBJECTIVES

4. Following a review of the factors leading to the shortfall in user-based income, six "innovative approaches" to increasing user-based payments and contributions to the Treaty's Benefit-sharing Fund in a sustainable and predictable long-term manner, and to enhancing the functioning of the Multilateral System by additional measures, were identified by the *Ad Hoc* Advisory Committee on the Funding Strategy.

5. These are:

SMTA-based approaches

- Revisiting Article 6.11 of the SMTA.
- Revisiting Article 6.7 of the SMTA.
- Upfront payments on access, to be discounted against payments due on the commercialization of a product.

Non-SMTA-based approaches

- Promoting regular seed sales-based contributions by Contracting Parties
- Novel ways to attract use-based voluntary funding.
- Expanding the coverage of the Multilateral System.

6. The primary focus of this study is on evaluating the potential to ensure a sustainable and predictable income, of possible revisions to SMTA Articles 6.7 and 6.11. Although the expansion of the Treaty's crop coverage will be addressed by the Working Group in a second phase, it is important to understand the financial implications in the context of benefit-sharing.

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[1] At http://www.planttreaty.org/content/background-study-paper-1, cited here as the "Background Study".

[2] At http://www.planttreaty.org/sites/default/files/OEWG-EFMLS_1-14-w3_en.pdf, cited here as "*Background*".

III. METHODOLOGY

7. In preparing the Background Study, *Estimating income to be expected from possible changes in the provisions governing the functioning of the Multilateral System*,[3] of which the present document is a synopsis, a number of methodological approaches were brought together:

a. The computer application that had been developed in the preparation of the recent study, *Assessing the potential for monetary payments from the exchange of plant genetic resources under the Multilateral System of the International Treaty on Plant Genetic Resources for Food and Agriculture*,[4] was updated and adapted, with new data on materials available under SMTAs, and to take into account the possible changes to Articles 6.7 and 6.11 of the SMTA.

b. A *New Interface* was programmed to support a *dynamic analysis* of the relationship between Articles 6.7 and 6.11, in order to test and validate a variety of scenarios and hypotheses, and support policy development.

c. A *static analysis* of the values of the current seed market, and the possible income to the Benefit-sharing Fund, as a result of proposed changes to the Treaty's benefit-sharing mechanisms, was undertaken.

d. A *simulation exercise* was developed, to test the likely reaction of the seed industry to possible changes to the Treaty's benefit-sharing mechanisms. In preparation for this:

   i. *Structured interviews* were held with a wide range of representatives of the seed industry.

   ii. A *Transaction Cost Analysis* was undertaken of using the SMTA in its present form, or with revisited Articles 6.7 and 6.11, and of the costs imposed by implementation, at national level, of the Nagoya Protocol to the Convention on Biological Diversity, on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization.

8. The documents resulting from these modules, and the New Interface, will be posted on the internet,[5] as they are finalized.

9. The current document provides a synopsis of this substantive programme in a condensed, and inevitably selective way. Readers are encouraged to consult the modules listed above for in-depth treatment of the issues summarised here, and may themselves use the New Interface for their own purposes.

IV. FINDINGS

SMTA-BASED APPROACHES

Revisiting Articles 6.7 and 6.11 of the SMTA, and expanding the coverage of the Multilateral System

10. The dynamic analysis of the relationship between Articles 6.7 and 6.11, and the static analysis of the values of the current seed market, together provide the analytic foundations of this study. They focus on the economic and other implications of possible changes to the SMTA, in particular, to Articles 6.7 and 6.11. They also assess the impact of an expansion to the Treaty's

[3] At http://www.planttreaty.org/content/background-study-paper-1.

[4] At http://www.planttreaty.org/node/4791.

[5] At http://www.planttreaty.org/content/background-study-paper-1

crop coverage, in terms of the potential income to the Benefit-sharing Fund this could create, in the context of these possible changes.

Assumptions

11. In order to be able to compare the current status with possible changes to the SMTA, the Study makes a number of assumptions regarding what these changes could be, as the basis for comparison. It assumes that:

a. Mandatory payments will be required for products marketed under either patents or PVP, in both Articles 6.7 and 6.11. Other products will not pay, in either option. Article 6.8 might drop away entirely, or be retained for any category of products, for which the Governing Body does not make payments mandatory.

b. Separate payments levels will be set for patents and PVP, and that the same ratio between these levels will apply in both Articles 6.7 and 6.11.

c. The Article 6.11 option will continue to be implemented by crop, or crop group.

d. Under Article 6.7, payments will continue to be required on a product-by-product basis, and under Article 6.11, payment will be required for all of a breeder or seed company's products marketed under patents, or PVP, of the crop or crops in question.

The Parity Point: describing the dynamic inter-relation of Articles 6.7 and 6.11

12. As described in *Background* (paragraphs 40–50), the *Ad Hoc* Advisory Committee on the Funding Strategy identified various aspects of the current structure of the benefit-sharing mechanisms embodied in the SMTA that create mistrust, encourage free-riding, and are a strong disincentive for users. If these structural constraints are to be overcome, and if the Article 6.11 option is to be made attractive to users, revisions to the SMTA will need to rebalance payment levels under the two payment options. The Parity Point methodology identifies the conditions under which the costs for users, in deciding for one option or another, are equal, and analyses the effects of offering the two, Article 6.7 and 6.11, options.

13. Potential users of SMTA materials, as rational cost-minimizers, will base their choice of whether to access SMTA materials at all, and if they do, whether to accept the Article 6.7 or the Article 6.11 option primarily on the relative cost to them of the two options.

14. Article 6.11 requires payment for *all* of a seed company's products, whereas Article 6.7 lays payment obligations only on *single products* descended from SMTA materials. The relative cost to a user is therefore governed simply by the inter-relationship of two factors: the percentage of his breeding pool obligated to the Treaty, and the different price levels set in the two options, that is:

(The percent of the breeding pool obligated to the Treaty) × (the option's payment rates).

15. That is, users will base their decision on:

a. The proportion of their products for which they will be obliged, by the terms and conditions of the SMTA, to make payment to the Treaty, and

b. The total annual payment that will result.

16. In the dynamic model, the proportion of their products for which they will be obliged to make payment to the Treaty is assumed to build up over time. The Parity Point is therefore the date at which payments due under the Article 6.7 option equal payments due under the Article 6.11 option.

17. Economic rationality means that the user will always opt for Article 6.7 until Parity Point is reached, and will always opt for Article 6.11 after it is reached. Until the Parity Point, Article 6.7 is cheaper, and after the Parity Point, Article 6.11 is cheaper.

18. The implications of the inter-relationship between Article 6.7 and 6.11 is therefore as follows:

a. The rates in Article 6.11 govern the theoretical maximum, because, once reached, this is the cheaper option.

b. The rates in Article 6.7, relative to Article 6.11, govern the Parity Point date.

c. The higher the Article 6.7/6.11 ratio, the sooner the Parity Point arrives. Conversely, the lower the Article 6.7/6.11 ratio, the longer it takes to reach Parity Point.

19. Fig. 5 from the Background Study, reproduced below, illustrates the role of payment rates in Article 6.11 in establishing the theoretical maximum.

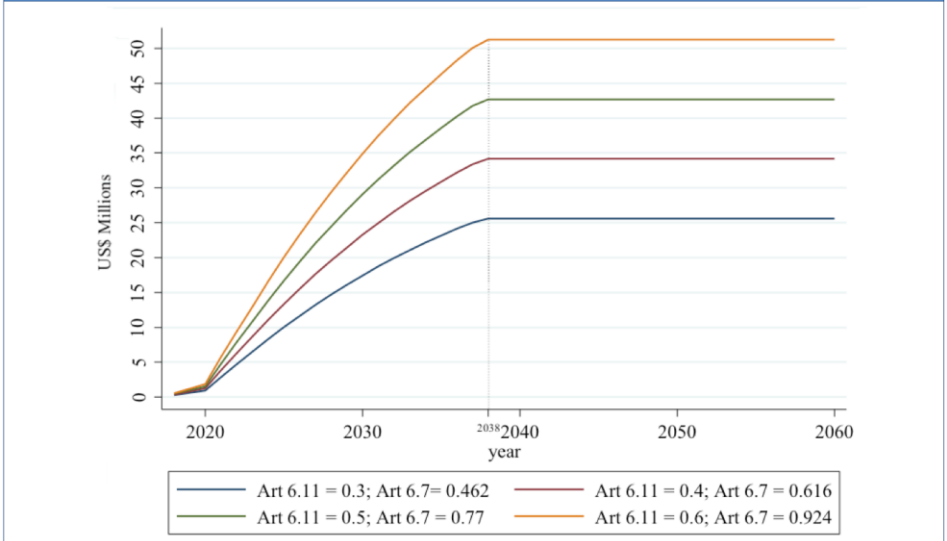
20. For the methodology, and use of symbols, see the Background Study. In the figure, the symbols denoting the payment rates (percent of product sales) under the two Articles are:

$\sigma_{6.11}(\mu_1)$ is the payment rate for *patented products*, in Article **6.11**.
$\sigma_{6.11}(\mu_2)$ is the payment rate for products under *PVPs*, in Article **6.11**.
$\sigma_{6.7}(\mu_1)$ is the payment rate for *patented products*, in Article **6.7**.
$\sigma_{6.7}(\mu_2)$ is the payment rate for products under *PVPs*, in Article **6.7**.

R is the ratio of the payment rates in the two options: **Article 6.7/Article 7.11**.

21. The potential income is projected at a number of different payment rates. The effect is clear: the Parity Point is reached in 2038, with these assumptions, and establishes the theoretical maximum, because users would then switch from the Article 6.7 option (which until then was cheaper), to the Article 6.11 option.

Figure 5. Trade-offs: Fixed parity year and total potential income



Line	U	R	$\sigma_{6.11}(\mu_1)$	$\sigma_{6.11}(\mu_2)$	$\sigma_{6.7}(\mu_1)$	$\sigma_{6.7}(\mu_2)$	Parity Point year	Benefits at parity (US$ millions)
Blue	0.26	1.54	0.3	0.078	0.462	0.12	2038	25.61
Red	0.26	1.54	0.4	0.104	0.616	0.16	2038	34.11
Green	0.26	1.54	0.5	0.13	0.77	0.20	2038	42.68
Orange	0.26	1.54	0.6	0.156	0.924	0.24	2038	51.22

22. The interrelation between Articles 6.7 and 6.11, which is presented here, has important real world implications.

a. Breeders and seed companies have many ways to avoid reaching a high percentage of SMTA material in their breeding pool, which — at any reasonable payment rates in Article 6.7 — means they will never find Article 6.11 cheaper:

i. They can avoid use of SMTA materials altogether, or, more likely, can take only a few materials under SMTAs, when they judge these to be especially valuable to their breeding programme, and when they cannot get them elsewhere.

ii. They can segregate materials received under SMTAs within their breeding programmes, so that only a small number of their products — where there is an real economic advantage — have ancestors received under SMTAs. Discussions with companies during this study confirms that this is already the case.

b. In these circumstances, the Governing Body, if it wishes to make the Article 6.11 option the default option, could consider radically increasing the Article 6.7/6.11 ratio — that is, decreasing the percentage of a breeding pool that is needed to trigger a user's decision to move to the Article 6.11 option — in one of four ways:

i. It could drastically raise the relative cost of the Article 6.7 option, but if this is raised too high, it will seriously reduce a company's economic ability to use SMTA material at all. Moreover, the higher the relative rates for Article 6.7 are set, the lower will be the theoretical maximum.

ii. It could drastically reduce the relative cost of the Article 6.11 option, but this would result in risible income for the Benefit-sharing Fund.

iii. Or it could try to vary the rates in both options, and in the process increase the spread between the two payment rates. This is unlikely to be effective, because of the real world ability to avoid, or segregate the use of, SMTA material.

iv. It might offer only an Article 6.11 option, but this would probably lead to users accepting no SMTA materials at all, as they would be required to pay on all their products, even when few descended from SMTA materials. This would create a structural disincentive to introducing SMTA materials into their breeding pool, particularly when they had, as yet, a limited number.

23. The inevitable conclusion of the dynamic analysis is that it would be extremely difficult to create an effective balance of Article 6.7 and 6.11 options, such that the Article 6.11 option can be the default option, by structural economic incentives alone.

Using the "New Interface" to the Computer model

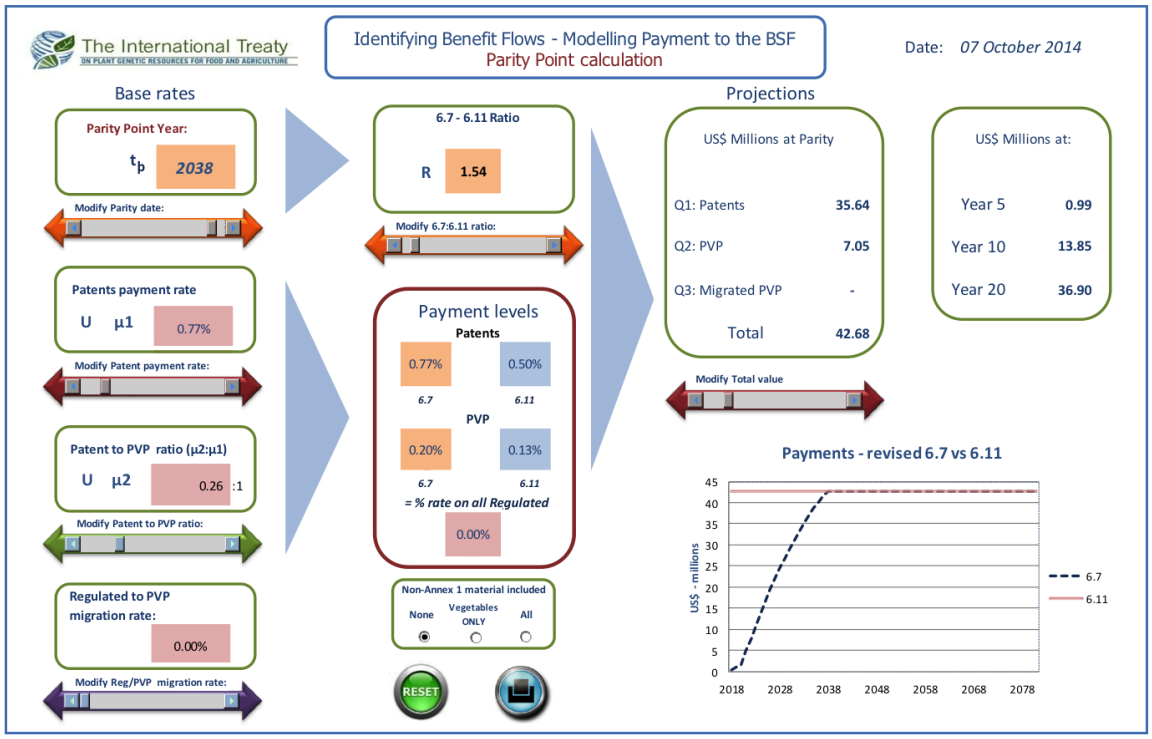
24. This dynamic analysis of the Parity Point was developed on the basis of a computer tool, the "New Interface" which makes it possible to vary the various parameters of the Parity Point analysis independently, and to set and test the effect of different payment rates.

25. Fig. 13 from the Background Study, reproduced below, illustrates the New Interface. The actual interface, and an explanatory note for users may be accessed at:

http://www.planttreaty.org/content/background-study-paper-1.

26. It can be used by anyone to test the effects of varying parameters and values. It is hoped that this will provide the Working Group with a flexible instrument to use in its further work.

Figure 13. The "New Interface"



Maximum potential benefit-sharing flows

27. Both the dynamic analysis of the inter-relationship of Articles 6.7 and 6.11, and the static analysis of the values of the current seed market, have produced estimates of the maximum potential income to the Benefit-sharing Fund, as a result of proposed changes to the Treaty's benefit-sharing mechanisms, using different and separate methodologies. This gives a more robust overall picture.

28. The values in both analyses are of *theoretical* maximum potential income, and, under real world conditions, income is expected to be much lower.

29. In order to apply differentiated possible payment rates to products, in accordance with the intellectual property protection under which they are marketed, both analyses distinguish benefit-flows in terms of (1) patented products,(2) products under PVP, and (3) "Regulated" products.

30. Regulated products characterizes a large subset of commercialized plant varieties that incorporate SMTA materials in their parentage, and which are not yet subjected to any form of intellectual property protection. The commercialization of such products is subject to seed quality control, multiplication and marketing regulations, which enable their privileged commercial exploitation, despite the lack of intellectual property protection.

31. Regulated products have been identified as a specific category, in order to be able to put a value on those materials, which, in the current SMTA, fall under Article 6.8, that is, they are *encouraged to make voluntary payments*, as are products under PVP. Article 27.3b of the TRIPS Agreement requires members of the World Trade Organization to "provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof", and it assumed that a part of the current Regulated category will migrate to the category of PVP over time.

32. Fig. 1 gives a picture of, and compares, total potential annual incomes, per product category, projected by the two analyses. The dynamic analysis values are at Parity Point (here, the

year 2038), with the current Article 6.7 rate of 0.77% for patents, and an assumed rate of 0.2% for PVP. The static analysis estimates values through a study of the current seed market, and applies the same rates (0.77% for patents and 0.2% for PVP, under Article 6.7) to the estimated commercial seed market share of products that might incorporate SMTA materials. The value of Regulated products has been calculated at a PVP rate of 0.2%.

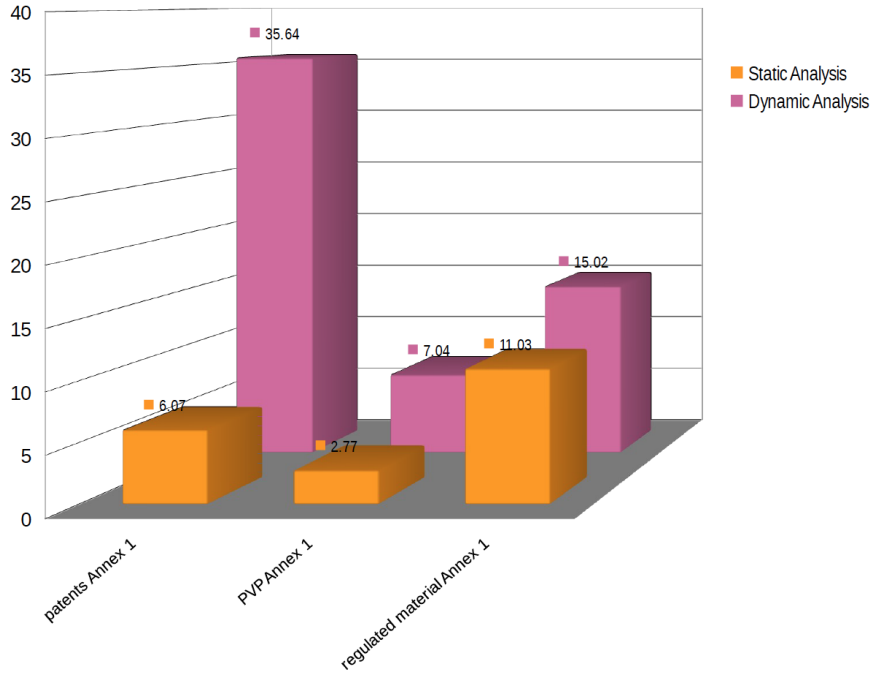


Fig. 1 Maximum Potential Annual Benefit Flows (*Annex 1*), per product category, according to the dynamic and static analyses (US$ million)

33. Values generated by the two analyses differ, because of the different methodologies, and the diachronic character of the dynamic analysis, in contradistinction to the static analysis. Both are based on reasonable, if optimistic, assumptions about the value of the world seed market, and are limited by severe data constraints, including a total lack of global variety-level information. One technical difference is that the static analysis employs information about past use of SMTA materials, or materials released by preceding institutions, while the dynamic analysis begins from the present, and assumes likely future use of SMTA materials.

34. Products marketed under patents represent by far the largest potential income, with maize the sole *Annex 1* crop with a large proportion of products marketed under patents (as is rapeseed, to a lesser extent). The dependence for income on patented maize is a structural problem, as users have a strong incentive to avoid the use of maize germplasm, when this would require acceptance of an SMTA, which drastically reduces potential income.

35. Although over time the migration of Regulated products to PVP may partly compensate for the failure to realise “voluntary” payments under Article 6.8, this is a very long-term possibility.

36. The difference in values between the two analyses illustrates the difficulty of obtaining a relatively accurate projection of potential benefit flows. However, the theoretical projections under both the dynamic and the static analyses are relatively small, and, once real world factors are considered, the actual sums that it may be possible to mobilise will be considerably lower.

37. Fig. 2 gives a picture of total potential income, with the same parameters as in Fig. 1, by product category, for crops currently not in *Annex 1*.

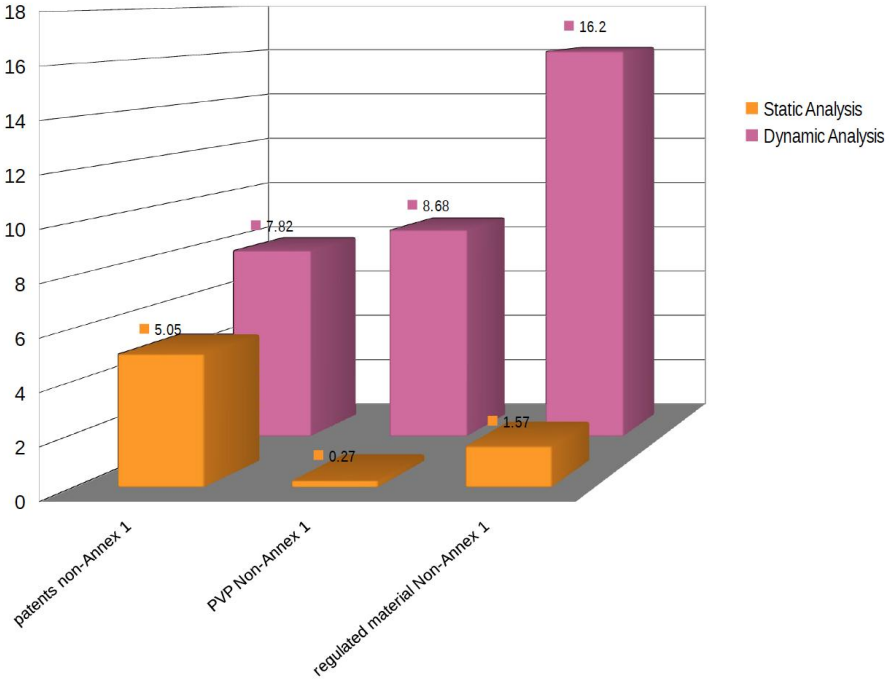


Fig. 2. Maximum Potential Annual Benefit Flows from non-*Annex 1* crops, per product category, in the dynamic and static analyses (US$ million)

38. No data on the full range of food, fodder and industrial crops is available. The dynamic analysis estimates non-*Annex1* values on the basis of IP strategies for crops in world *ex situ* holdings generally. The static analysis considers four key crops for which data was obtainable: tomatoes, onions, soy bean, cotton. Because of the large global area share for genetically modified varieties of soybean and cotton, with a high percentage of patented products, the static analysis values for patents (Fig. 2) are very high.

39. The dynamic analysis estimates that 36% of total potential benefit-flows would come from the expansion to all crops, the static analysis, 25%.

40. A separate static analysis was undertaken of Regulated products, to have an idea of potential, as if they had already migrated to PVP: this suggest they might, in the long term, account for 95% of the income from crops not currently in *Annex 1* (oil seeds, soya, etc.). The dynamic analysis estimates 66%.

41. As vegetable breeders have consistently pointed out, vegetable crops are sorely under-represented in *Annex 1*, which limits their potential contribution to benefits. Moreover, they are not able to benefit from the facilitated access provided by the Treaty, and the legal certainty provided by use of the SMTA, which is becoming increasingly important, as the Nagoya Protocol is translated into national implementing legislation and regulations. Vegetable breeding enjoys a higher profit margin than most of the seed industry. They are most anxious to see the rapid extension of the crop coverage of the Treaty, and best placed to be able make effective contributions to the Benefit-sharing Fund.

42. The two analyses project maximum potential income assuming high payment rates, and these are certain to be far too optimistic, because:

a. The dynamic analysis assumes that all Contracting Parties have already made all their *ex situ* holdings available, and as the *Appendix* to *The current status of the Multilateral System of Access and Benefit-sharing* shows, this is not the case. The projection must therefore be discounted by this factor. Every delay in making material effectively available also pushes potential benefits further forward in time.

b. Neither the dynamic nor the static analysis make allowance for avoidance of SMTA material, even though it is clear, and corroborated by discussions with members of the industry, and the results of the simulation exercise, that users have been avoiding SMTA materials, when they are breeding for a product that is to be marketed under patent protection. They have been using materials in cases, where, in accordance with the current SMTA, only voluntary contributions are foreseen, and none have been made. If mandatory payment is now extended to PVP, it is likely that the level of avoidance of SMTA materials will rise substantially, particularly when, as is often the case, alternative sources of materials are available. The projections should be further discounted to allow for this.

Other innovative approaches: Upfront payments on access, to be discounted against payments due on the commercialization of a product

43. This innovative approach would apply to Articles 6.7/6.8, and its objective would be to shorten the time between accessing a material under an SMTA and receipt of income for the Benefit-sharing Fund. It would trade a reduction in overall income to the Benefit-sharing Fund against earlier income. Recipients would be provided with an option to make a payment on receipt of a material, and in exchange pay at a reduced rate when a product is commercialized.

44. This approach would generate benefit-sharing flows even lower than those projected, and presented in the previous section. It does not show any improvements in terms of sustainable and predictable income, and user acceptance. Transaction costs are more likely to be raised than reduced.

45. There are a number of ways in which such an approach could be operationalized, but many technicalities would need to be addressed. Factors that might be taken into account have been listed in the Background Study, paragraph 98. They would include:

i. Whether upfront payments would be counted against individual products derived from individual materials, or whether they might be counted against any product, for which payment to the Benefit-sharing Fund is due;

ii. Whether discount rates should vary over time, and on what basis;

iii. What discount rates would, in practice, attract commercial users; and

iv. Whether the possible speeding-up revenue to the Benefit-sharing Fund would be worth the added transaction costs, for the Treaty, of accounting for upfront payments, and the lower overall income.

46. Consultations with industry reveal that an upfront payment would be welcomed, if it took the form of a low access fee, as an alternative to the current benefit-sharing provisions, but this is not the same as the current innovative approach. In that case, it was felt that any further payment on the commercialization of a product would have to be extremely low, or include a *de minimis* clause.

NON-SMTA-BASED APPROACHES

Promoting regular seed sales-based contributions by Contracting Parties

47. The *Ad Hoc* Advisory Committee considered this approach on the basis of the Norwegian decision to make an annual contribution 0.1% of the value of all seed sales on its national territory (both *Annex 1* and non-*Annex 1* crops), separate from the workings of the SMTA. In announcing the decision, Norway estimated that, if all developed countries made similar contributions, about US$ 200 million would flow to the Benefit-sharing Fund over ten years. Between 2009 and 2014, Norway contributed US$ 648,178 through this initiative.

48. The Governing Body has appealed to other Contracting Parties to take similar decisions, and so provide the Benefit-sharing Fund with substantial and reliable income, but to date no other country has done so.

49. In technical terms, it would be possible to structure user-based contributions on a territorial basis, similar to this initiative. Territorial approaches could provide a framework for innovative arrangements between the Treaty and user groups in the territory of individual Contracting Parties, for example, to promote non-monetary benefit-sharing, or to make coordinated contributions to the Treaty, and perhaps be recognized for doing so. A Contracting Party might decide how to raise those funds, from users directly, or, as in Norway's case, from central resources.

50. There is support from industry for such approaches. The interviews held with stakeholders demonstrated a recognition of social responsibility, for food security and sustainable agriculture, but also a sense that the attempt to put the entire cost of benefit-sharing for access to plant genetic resources for food and agriculture on the seed industry is not equitable. They feel that the benefits of access are reaped not only by seed breeders, but also by farmers, marketing chains, and ultimately by consumers. The seed industry would be able to commit to make contributions, if other beneficiaries also did. The simulation exercise showed a willingness for cooperation with Governments in providing resources for benefit-sharing, as Fig. 3 shows.

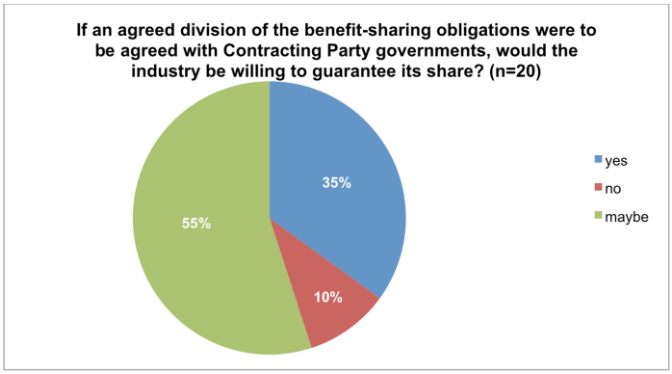


Fig. 3. Burden-sharing Between Contracting Parties and the Seed Industry

51. In order to operationalize this approach, ways need to be found to make contributions mandatory.

52. The Norwegian seed-sales based contributions are currently the only predictable income to the Benefit-sharing Fund. The Working Group might therefore wish to clarify whether other Contracting Parties would be prepared to make regular seed sales-based contributions, and under what conditions, within a larger package of innovative benefit- sharing approaches, to provide sustained and predictable income. It may also consider other approaches that might create predictability in Contracting Party contributions, such as a periodic pledging conference, possibly at the time of the periodic establishment of the funding target. In this light, this concept could be considered more of the nature of a way of structuring contributions from Contracting Parties, than a user-based approach.

Novel ways to attract use-based voluntary funding

53. The identification of this innovative approach arose from direct discussions regarding the proposed Industry Licensing Platform (ILP), between the *Ad Hoc* Advisory Committee and the Vegetable Industry Working Group and other stakeholders. These discussions had not been

completed at the end of the last biennium, and are extensively covered in the reports of the *Ad Hoc* Advisory Committee. At that stage, consideration was given to the ILP making a voluntary payment to the Benefit-sharing Fund, in the form of a percentage of licensing fees. There is no indication that this has been retained in any current plans for the ILP. Until further information regarding the possible establishment of an ILP appears, little more can be said about this specific proposal.

54. This specific example apart, the extensive discussions between the Vegetable Industry Working Group and the *Ad Hoc* Advisory Committee demonstrate that a private industry initiative, based on an association of a group of companies, could include benefit-sharing, perhaps as part of its membership agreement, if a *modus vivendi* between that group and the Governing Body could be reached.

55. This is a cutting-edge innovative approach, and appears to have considerable potential, but there are currently no relevant on-going discussion with any such group of industries.

56. Such approaches, if agreements are reachable with adequately representative industry bodies, could provide a way in which the Governing Body could extend the governance of the system, and the scope of user-based benefit-sharing, towards a downstream, pooled good, managed by end-users according to collectively agreed principles that facilitate access to proprietary materials. Such approaches could maintain intact the principle of different levels of payment between different levels of restriction over access, and could be combined with "subscription" models designed to reduce transaction costs for users.

57. There are, however, many practical and institutional questions that would need to be addressed, and any final approach can only be structured in direct consultations with possible industry partner groups. Major questions to be addressed would include:

i. How payments under this scheme would relate to any payments due under SMTA Articles 6.7/6.8 and 6.11.

ii. Whether payment obligations and levels, due under SMTA Articles 6.7/6.8 and 6.11, could be varied, in the context of an overall scheme that created an acceptable income stream from such an industry group.

iii. Whether an agreement between the Governing Body and such a group would be necessary, and what form this would take.

V CONCLUSIONS

57. A number of general conclusions can be drawn, to bring together the results of the various approaches adopted in this study.

The theoretical analysis of potential income, and limiting factors, in the real word

58. Both the static and dynamic analyses of potential values suggest that the theoretical maximums are relatively low, at levels of payment that breeders and seed companies are able to afford, and are willing to pay. As was repeatedly stressed, as part of both the dynamic and static analyses, potential values should not be understood as values that can be realized. Real world conditions all combine to suggest that, with the current structure of the Treaty's access and benefit-sharing system, a number of contradictions in practice extrapolate to low limits on what can realistically be expected.

59. The SMTA is a private instrument, to which breeders and seed companies voluntarily subscribe, which applies to individual samples ("accessions") of plant genetic resources, usually of little proven value, and where there is a supply of the identical or alternative material outside the Treaty, often free. Moreover, many Contracting Parties have not yet taken steps to make their

material available, and according to interviews with representatives of the seed industry, a number are not, *de facto*, providing materials in accordance with the provisions of the Treaty.

60. Potential commercial users of material under SMTAs are rational economic agents, who must take these and other factors into account when deciding to access materials under SMTAs. They weigh the costs and benefits.

61. To date, no income has come to the Benefit-sharing Fund, from either Article 6.7 of the SMTA (mandatory payments for patented products that had incorporated SMTA material), or from Article 6.8 (voluntary payments, when patents or similar restrictions on use of the genetic material of the product are not claimed).

62. Nothing suggests that the lack of Article 6.7 income is because users have not made payments that were due: the conclusion must be that those who intended making patented products avoided using SMTA materials, and interviews with members of the industry confirm this. Both the static and the dynamic analyses confirm that patented materials would be the largest potential source of income, if avoidance were not the case.

63. The simulation exercise confirms that many users have been willing to access SMTA materials "under Article 6.8", in other words, in the full knowledge that there are no binding obligations. That users then make no payment is not purely a matter of opportunism: seen in terms of profit, rather than of sales, payments at or near the level foreseen in Article 6.7 represent a substantial part of profit. Even more critical is the linkage of two facts: competitors may be able to access equivalent materials at lower or no cost elsewhere, and — as the games theory analysis in fig. 4 shows — no user can afford to be the first payer, without a high risk of losing market competitiveness, as a result of an uneven playing field.

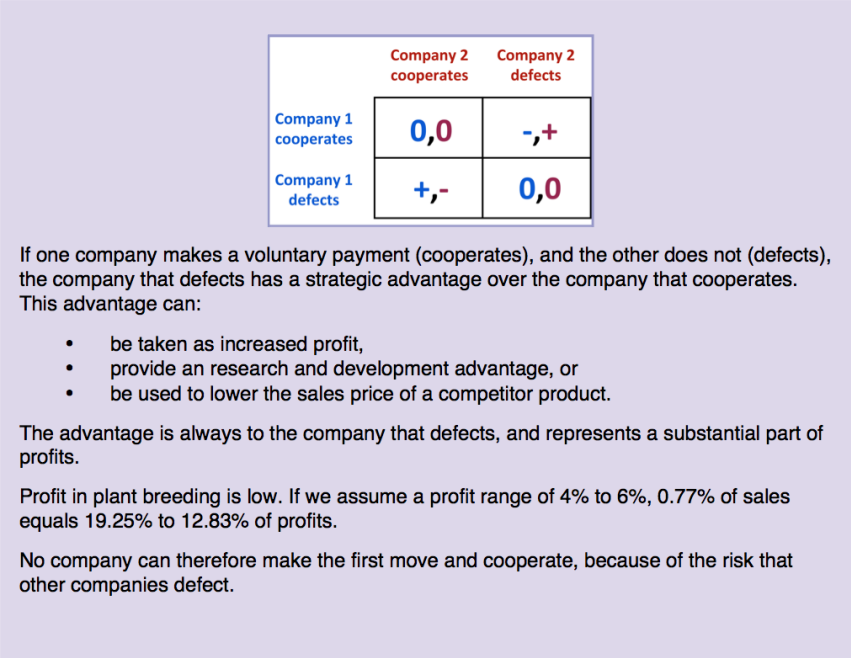


Fig. 4: Games theory and voluntary payment — a lose-lose scenario

64. Commercial users do not have the latitude to take decisions against their economic interests, when these could put their enterprises as risk. A provision in a contract that appears to put a moral obligation on a user, coupled with a *de facto* understanding that it will be ignored, can only be a source of tension and cynicism.

65. It is not only companies in developed countries that are ignoring the obligations of Article 6.8, because no contributions have been received, either, from state, parastatal and private bodies

in developing countries, which commercialize products that incorporate materials received under an SMTA.

66. The use of a private instrument, the SMTA, entered into voluntarily, with these real constraints, means that commercial producers who make a payment, under either Articles 6.7/6.8 or 6.11, cannot simply recoup all or part of the cost of access, as a production factor, in setting prices, which would allow them to pass this cost up the chain to seed users, and ultimately to the consumers of agricultural commodities, as they could do with a tax on the whole industry. The whole burden therefore falls on seed sales, in an imperfect market, and individual companies have legitimate economic reasons to work around the Treaty.

67. The simulation exercise confirmed that, should the Governing Body decide to make mandatory payments voluntary, the phenomenon of avoidance will extend to the category or categories of products where payments are made mandatory.

Transaction costs and managing regulatory interactions between the Treaty, and the Convention on Biological Diversity and its Nagoya Protocol

68. The Working Group has stressed the importance of making the Treaty attractive to commercial users. But there is an economic paradox to overcome. Companies express strong support for the Treaty and its objectives. They are strongly of the opinion that the management of the crucial agricultural genetic resources on which food security depends should be in the agricultural sector. They share the opinion that an ineffective Treaty, within the wider international regulatory framework deriving from the Nagoya Protocol, will be deleterious to plant breeding, with negative knock-on effects on world food security, and the conservation and sustainable use of plant genetic resources for food and agriculture. They wish to see the Treaty work, but find it difficult to contribute on a practical level, within the contradictions surrounding the use of the SMTA.

69. However, interviews with members of the seed industry also showed a belief, shared between large and small companies, that larger companies, with substantial legal and financial resources, are most likely to be able to acquire agricultural resources for exclusive use, outside the Treaty, under the provisions of the CBD, and often relatively cheaply. Smaller companies stressed that the effect would be to drive the whole industry towards horizontal and vertical consolidation, with the risk of monopolies developing.

70. The seed industry believes that the benefit-sharing provisions of the CBD, and the enforcement provisions of its Nagoya Protocol, are applicable primarily to bioprospecting in the pharmaceutical sector, where a single sample may prove to have in it a synthesizable, patentable chemical, that can then be the basis for large profits. This is a very different situation to plant breeding, where the raw materials are of very low value, and where substantial value-added through research and breeding builds up only late in the process, when a wide range of materials have been combined, and repeated selections made. This is clear from prices in commercial practice.

> "Genetic resources that simply widen a company's gene pool but are without identified properties of interest have essentially no commercial value, as they require long-term investment and the return on that investment is risky. Much material, including pre-bred material, is available free from the public sector. Payment, if any, for exotic and unadapted material, and even pre-bred materials, will normally not exceed a nominal fee, such as US$ 5-20.
>
> "The value of material will increase with characterization and evaluation, if there is an indication of a trait or characteristic of potential commercial interest. Primarily in the vegetable area, if pre-bred material shows a potential value, lump sums in the range of US$ 5,000 to 50,000 may be paid for a limited number of pre-bred lines, in advanced development stage, which require only another 2-3 years development before

commercialization. Such material will normally be obtained on a non- exclusive basis. There will normally be no prohibition of seeking IP protection for research results. Royalty rates will normally not be paid."[6]

71. The costs of ingressing raw materials and cleaning out deleterious or worthless traits are high. Most of the new value in commercial plant breeding is first introduced through stabilized and pre-bred materials, most usually from national public institutions, and in particular the International Agricultural Research Centres of the Consultative Group on International Agricultural Research, all of whose materials are released under SMTAs.

72. The major perceived value to breeders and the seed industry is that the Treaty facilitates access to plant genetic resources on a non-rival and non-excludable basis, and provides its user with a coherent legal framework, and legal certainty in the use of these resources. The proposed innovative approaches before the Working Group provide for further simplification of the Treaty's access and benefit-sharing systems, particularly in the context of a revisited Article 6.11.

73. The comparative analysis of transaction costs involved in using the SMTA, in the context of revisited Articles 6.7 and 6.11, and of the national implementation of the Nagoya Protocol, using the example of the recent European Union Regulations, underlines the willingness of breeders to support the Treaty, and seek ways to create effective benefit-sharing, as long as the Treaty is able to maintain an effective legal system for plant breeding that resolves the question of regulatory overlap with the CBD. Such regulations, the industry believes, create legal uncertainty, and put a heavy and expensive burden on breeders and companies that are working entirely without recourse to materials accessed through contracts established in the context of the CBD. This provides a favourable climate for establishing a simplified Article 6.11 subscribers' club, as is outlined in *Background*, which does away with tracking and tracing obligations, with regard to all the materials in a subscriber's breeding pool, and for exchange between subscribers. For this to be possible:

a. The SMTA would need to be accepted as the internationally recognized certificate of compliance for all products of subscribers to a simplified Article 6.11, and

b. An accompanying declaration of non-use of materials accessed under a CBD type contract should fully suffice for the market approval of new plant varieties of subscribers to the Article 6.11 option.

74. Moreover, members of the seed industry — particularly the vegetable industry — stressed that the immediate expansion of the Treaty's crop coverage to all plant genetic resources for food and agriculture, including for industrial and all other uses, is highly desirable, for the system as a whole to be coherent and meaningful, and constitute an desirable alternative to bilateral MTAs.

75. There is a willingness for cooperation with Governments in contributing to the Benefit-sharing Fund, as was shown in Fig. 3 above.

76. In this context, the current access and benefit-sharing procedures of the Treaty involve high but hidden transaction costs for Contracting Parties, including the costs of negotiating its elements, and of maintaining its oversight, management, and enforcement systems. To these must be added the costs to users of emitting and receiving SMTA, and tracking and reporting upon their use. If benefits in the range of, say, US$ 25 to 50 million annually were to be considered reasonable — benefits similar to the estimates deriving from the static and dynamic analyses — the transaction costs involved in managing the SMTA as a private contract are relatively very substantial.

[6] Walter Smolders, *Commercial practice in the use of plant genetic resources for food and agriculture*, Commission on Genetic Resources for Food and Agriculture acting as Interim Committee for the International Treaty on Plant Genetic Resources for Food and Agriculture, Background Study Paper No. 27, paragraphs 29–29, available on the internet at ftp://ftp.fao.org/docrep/fao/meeting/014/aj346e.pdf.

The attractiveness of the Innovative Approaches

77. If the willingness of the seed industry to contribute to solutions has grown strongly, a number of technical and institutional economic problems remain.

78. The seed industry, in the interviews and in the simulation exercise, expressed the opinion that the SMTA did not reflect normal commercial practice. A specific problem that was frequently raised was the fact that payment obligations devolved on the enterprise commercializing the final product, whereas, in many cases, these companies were no more than multipliers of seed, who pay a royalty to the breeder, and have no understanding of, or interest in, questions of access. Plant breeders feel that, in real market situations, they are unable to negotiate royalty contracts with these companies, if they also have to impose the SMTA.

79. Other matters which have been raised include the lack of a *de minimis* provision in the SMTA, and the inability to renounce the contract. These provisions may be necessary in the context of benefit-sharing that relies on the SMTA, a private contract, in the specific circumstances of the Multilateral System, but they are felt to conflict with normal commercial practice.

80. The dynamic analysis has revealed the inherent technical problems involved in managing a benefit-sharing system that offers two payment options, as well as the fact that breeders can easily avoid reaching a point where the quantity of materials in their breeding pools ever makes it economically worthwhile to pass to the Article 6.11 option. Attempts to make the Article 6.11 option more attractive, by raising the rates of the 6.7 option, or dropping the rates of the 6.11 option, would need either to raise the Article 6.7 rates so high that breeders would be unable to use material from the Treaty, or drop the 6.11 rates to a level where the projected income is risible.

81. The results of this economic analysis suggest that a solution to the need to generate acceptable, sustainable and predictable income for the Benefit-sharing Fund cannot be found by manipulating the rates alone.

82. Moreover, the expansion of the Treaty's crop coverage to all plant genetic resources for food and agriculture, which is highly desired by many members of the plant genetic resources community, would not necessarily generate higher income for the Treaty, unless the basic contradictions of the current system are resolved, because the economic logic of decisions as to whether or not to accept materials under an SMTA would not have changed.