



LabelSud

**Qualification et Certification
des produits tropicaux**

Delivery Report
Preliminary Case Study
Basmati Rice in India

December 2005

MARIE-VIVIEN Delphine , lawyer, CIRAD-Tera, UR Qualification and territories/UMR Innovation, National Law School Bangalore India

GAY Frédéric , ecophysiologist, CIRAD-CA, UR Rice breeding and management, Cuu Long Delta Rice Research Institute Vietnam

DEVAUTOUR Hubert, socioeconomist, CIRAD-Tera, UR Qualification and territories/UMR Innovation, Montpellier

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**BASMATI MISSION REPORT
08-13/12/2005**

1. OBJECTIVES OF THE MISSION:

- To take stock of the development of GI application for Basmati rice in India
- Identify stakeholders involved in this process
- Collect basic information and opinion “from the field” on Basmati rice cultivation, processing and trade

2. PROGRAM:

Date	Place	Organisation/Company	Contact
08/12	New Delhi New Delhi	IPR Juris, Law Firm All india rice exporter association (Airea)	Mr Vijay Kumar Jain Brigadier Anil Adlaka
09/12	Karnal district, Haryana state	Setia Exports Ltd	Mr Vijay Setia, Director – Rice Division
10/12	Karnal district, Haryana state	Department of Agriculture Karnal district	Mr Nar Singh
12/12	Karnal district, Haryana state	Department of Agriculture Karnal district	Dr Surinder Singh - Director
12/12	Karnal district, Haryana state	TILDA Riceland Private Limited	Dr Anuag Tiwari – R&D division
13/12	New Dehli	Economic Mission – French Embassy	Pascale Fleury
13/12	New Dehli	APEDA	Mr KS Money - Chairman

3. MEETING MINUTES

IPR Juris Law Firm, Mr Vinay Kumar Jain, Partner
December, 8, New Delhi

- Mr Vinay Jain is the lawyer in charge of the geographical indication application on Basmati Rice filed at the GI registrar, Chennai, on August 2004. The application is under pre-examination status and has not been published now. The file is very dense (about 100 pages) and it took one year to make it and gather all the elements required for drafting the specification (geographical area, history, process...).
- There has been lot of infringements at the national and international level of Basmati Rice.
- Three states are producing Basmati Rice: Haryana (10 district), Punjab (3 districts), Kashmir
- Document to proof the origin of Basmati Rice was the Karnal Gazette of 1883.
- Only 7 varieties are agreed in the GI application: Basmati 370, 386 Superbasmati, Type 3 (Pusa basmati), Traori basmati (HBC 19), basmati 217, Ranbir basmati (IET-I 1348) but 12 varieties are classified as basmati in the Seed Act of India (traditional and crossed).
- Domestic infringement is due to new varieties that are labelled Basmati, and therefore all rice grown in Haryana is labelled Basmati whereas it is not true. There is a problem of confidence, infringements are generalized and it's not possible to find true Basmati rice.
- Mixture of Basmati and non-Basmati is operated at the level of millers.
- 80 millions tons of Basmati Rice are exported from India.
- Mr Vinay Jain complained that nobody wanted to accompany him in filing the GI application. In particular, the exporters didn't want to join him, and more particularly the Airea. Therefore, he created a NGO opened to farmers growing Basmati opened to anyone named “Heritage” as applicant of the GI. Members of this NGO are 2 millers, 2 commission agent, 2 traders, 4 farmers.

He complains that APEDA is only working with exporters and that there is no equivalent of farmer's organisation at the national level.

- To complicate to register the authorised users so all farmers located in the area should be able to use the denomination Basmati. But it will be the millers who will label the product when going out of the mill.
- There is a problem of premium for farmers as it is traditional variety which is very long to grow so only one crop per season is possible. Farmers get 12 Rps/kg of paddy rice whereas non Basmati are sold 14 to 16 Rps/kg.
- True Basmati rice is harvested in November, not in June (long cycle and photosensitive).
- Vinay Jain has been cited in an article in India Together written by Varupi Jain in June 2005 to make the process of protection of Basmati Rice going faster and he wants to file a petition to the High Court to denounce lacunas of GI law in India. He is again cited in another article of India Together dated February 2006.

All India rice exporter association (Airea) - Brigadier Anil Adlaka

December 8, New Delhi (very short meeting)

- Brigadier Anil Adlaka is the president of Airea and member of Origin organisation as vice-president for Asia.
- According to Brigadier, application for Basmati Rice should be done together with Pakistan since the beginning. According to him, the GI application currently pending is only gathering 10 people and so not representative of the operators concerned by Basmati.
- 11 varieties of Basmati: 6 traditional and 5 evolved.

Chaman Lal Setia Exports Ltd. - Mr Vijay Setia rice division director & 3 producers and commission agents

December, 9 and 10. Karnal, Haryana State

- Mr Setia is a rice miller and exporter of Basmati rice for almost 30 years. His company has 2 milling factory : one in Punjab state specialised in Basmati and the one he managed in Haryana specialised in parboiled rice. His contact was advised by Brigadier Anil Adlaka and by the District Agricultural Officer of Karnal.
- 15 millers in Karnal district but only 5 exporters.
About 40 companies export Basmati all over India.

About Basmati production in Haryana state: "Bas" means aroma and "Mati" means rice in Sanskrit.

- Haryana is not a traditional area for Basmati production as Punjab is. About 30 years ago Basmati was only cultivate for self consumption not for export in Haryana.
- At the moment, Haryana state is number one for Basmati production with 40% of rice area dedicated to Basmati varieties: 70% of Pusa Basmati type and 30% of traditional Basmati.
- In Haryana soils are less fertile than in Punjab causing less lodging. Nevertheless Basmati varieties give better aroma in Punjab mainly because of cooler time during maturation. Actually, quality of Basmati varieties including all quality traits (head rice recovery, brightness, chalkiness, cooking quality...) is decreasing as far as they are grown from Himalaya's foothills. Within Haryana there is a "sun belt" where the temperatures during ripening are too warm for Basmati and generate more breakage of the grain structure. Basmati rice is more sensible to layering and it involves mix of mature and immature grains when harvesting.
- Nowadays, production of Basmati is decreasing because it is not enough profitable for farmers compared to other crop or agricultural production. Farmers gain more profit with ordinary rice (especially in areas where 2 crops a year of standard rice are possible). Nevertheless, some farmers prefer growing Basmati because it's less difficult to manage and it requires less input and water.

About Basmati varieties

- Two traditional varieties from where are stemming the others: Bas370 and Bas 386. 370 is the original one, 386 was produced in Pakistan during the English time. Today 370 is shorter and consequently less paid (used mainly for autoconsumption). 386 is the most important in Punjab.

- Traori Bas which is local variety of Haryana has been obtained through pure line selection of Bas 386.

Other traditional variety : Type 3 and Type 6.

- From an agronomical point of view, traditional Basmati varieties show the following constraints:

- Low yield = 2 to 2.5 T/ha
- easy lodging
- high pest and disease susceptibility
- long duration crop (145 days at least) hampering establishment of winter crop.

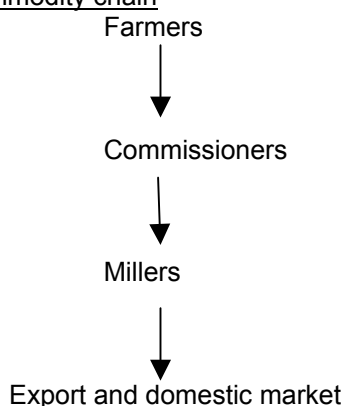
- For the last 20 years efforts have been undertaken to overcome those problems especially increase potential yield of Basmati. It led to release of PUSA-1 : shorter plant height, good cooking quality and aroma, yield about 4 T/ha.

In the coming years, release of Basmati hybrid with potential yield of 10T/ha is expected.

No production of certified seeds of traditional Basmati through national and local seed production system.

Interbreeding involve that Basmati characteristics disappear.

About Basmati rice commodity chain



- Rice market : 70% domestic, 30% export
Basmati parboiled: 10% domestic, 90% export
- Farmers come to collect points organised by local authorities to sell their production to middlemen (commissioners) who then are in charge of cleaning the rice and sell it to millers. Government marketing board allow stores to commission agents on these collect points. Commission agents unions are strongly opposite to millers. Producer's organisations are weak.

Millers do not buy directly to farmers.

- Farm gate prices :
12 rupee/kg for paddy trad. Bas-10 rupee/kg for paddy PUSA type-6 rupee/kg for ordinary paddy rice
- Government ensures support price for ordinary rice not for Basmati.
- Criteria used for the price: appearance, length (less expensive if shorter) and cleaving.
- Consumption of aromatic rice in India stagnant. Consumers compromise on price they'd rather paying 20 rupee for none pure Basmati rather than 40 rupee for extra pure Basmati. In northern India, Basmati rice is only consumed for parties and occasions.
- For export, each batch is checked by Indian Export Agency. They even proceed to DNA test to identify adulteration by non basmati rice.
- To Europe, rice is mainly exported as cargo rice due to lesser duties on cargo rice than on polished rice. Polishing is mainly done in UK.
- On Mr Setia's opinion, added value connected with high prices of Basmati in European countries is made by polishing companies in UK.
- Final rice is usually a mix: for example for Saoudia Arabia, they mix 70% traditional Basmati and 30% Pusa Basmati.

About SETIA activities

- 50 000 T of paddy produced in a year. 60 to 70% of parboiled rice. 90% of parboiled rice is for exports.
Export to Middle-East and Europe (U.K.).

- 4 varieties for trade: BAS 386, Traori Bas, Type 3 and 6.
- Diversification of rice products and by-products: artificially coloured and perfumed (green/cardamome, yellow/safran...), rice for diabetics (low glucose index), smoked rice, use of rice ashes to make bricks which can absorb more water helping to prevent diseases related to stagnant water....

Visit of SETIA processing plant

- 2 separate unit for parboiled and non-parboiled rice, 3 T/h each
 - Aging: Basmati rice is stored as paddy during one year before being milled. This process ensures better milling yield and cooking quality without damaging aroma.
- At SETIA paddy bags (jute cloth) are stored open-air (see pictures)
- Parboiling: double cleaning and double steaming. First steaming to “shock” the grains then soaking during 6.5 hour up to 30% grain moisture. 2nd steaming followed by 3 stages drying from 18 to 16 then 16 to 14 and finally 14 to 11.5%.
 - Milling: after husking brown rice is cooled and then soft polished to limit broken grains. 6% max broken grains after polishing.
Colour sorting (Satake) to obtain 0% broken grain.
Overall yield of milling = 65-68%
 - Environmental management of the plant: recycling of steam from parboiling unit to warm water; hull ashes used to purified water contaminated with starch and others grain leach ate.
 - No artificial drying for Basmati rice. Heat is responsible for disappearance of aroma. Maximum of 30 °c in heart of rice.

Karnal District Agricultural Department – Mr Surinder Singh, Director, and his staff.

December, 9 and 11. Karnal, Haryana State

Classification of rice varieties

- Super fine rice

Traditional Basmati varieties (landraces): HBC19 (2 to 2.5 T/Ha), Traori Basmati, Basmati 370, CSR30 (suitable for alkaline/saline soils)

Evolved Basmati : Pusa Basmati 1 (4 to 5 T/Ha)

- Fine rice

Sarbati (landrace): same grain characteristics as HBC19 without aroma

PUSA 44

And many local varieties

- Coarse grain rice

PR (Pusa rice) group from Punjab University. High yield potential (9.2 T/ha), 7 T/ha on the field

SKR group from Karnal University. (SKR 120 or SKR 126) Yield potential 8-10 T/ha

Hybrid varieties are coming: PSB71

Characteristics of Basmati

- Grain length and aroma

- HBC 19 is the best

- When exported Basmati traditional varieties are often mixed with Pusa Basmati 1 or Sarbati

Blending can reached 30%

Some figures about Karnal agricultural activity

Arable land area = 229 000 ha

Irrigated land area = 214 000ha

Nb of farm households = 105 125

Rice area = 160 000ha

- 10-15% superfine rice

- 10-15% fine rice

Rice production = 450 000 T

Cropping systems in Karnal

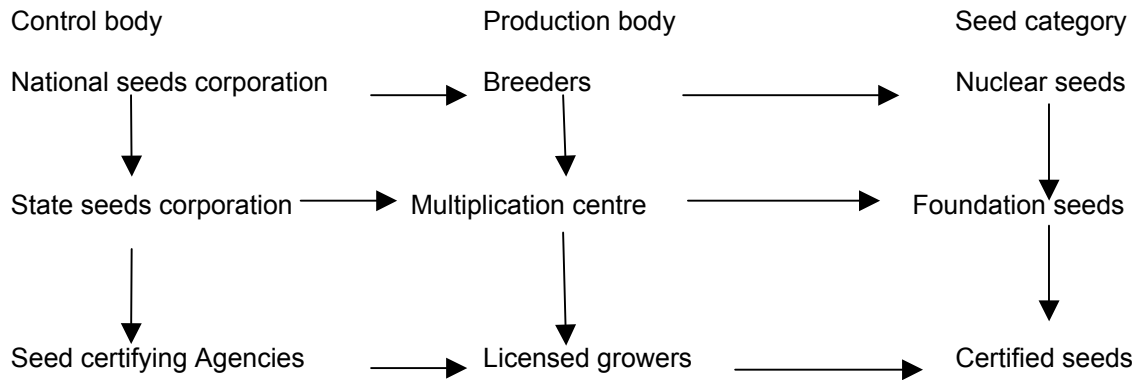
Two main crops:

- summer-autumn (rainy season) : rice or sugarcane from july to early november

- winter-spring (dry season) : mainly wheat (160 000 ha) from late November- early December to May-June

2 rice crops are possible if short duration (100 days) varieties are used. However double rice cropping is not encouraged because it threatens water resources (1st crop needs 2200 L/, 2nd needs 5000). Karnal Department of Agriculture is working on crop diversification and cultivation practices such as zero tillage and direct seeding to improve water efficiency by limiting water losses.

Seeds production



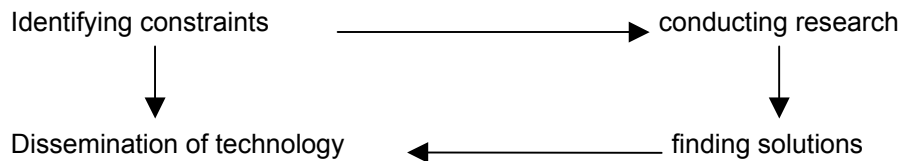
Seed processing plant is established at the village level.
This system does not produce certified seeds of Basmati landraces.

TILDA United Rice Inc. Dr Anurag Tiwari – R&D division

December, 12. Karnal district, Haryana State

- TILDA is one of the biggest Indian rice exporters (biggest company in the world for Basmati rice). Company is 28 years old with main site in India (Karnal district) and processing plant in UK, USA, Canada and Uganda. In Uganda TILDA also supports 10 000 rice farmers. The contact with Tilda was established by District Agricultural Officer.
- TILDA has set up 2 programs to support Basmati rice production :
 - FACE : Farmer Advisor CELL
 - FOSTER : Field Of Systematic Trials & Experiments on Rice
- FACE activities
 - 90000 farmers participating to FACE mainly in Haryana state
 - Extension Services : Hotline for farmers, Radio programs (including weather forecasts), Basmati audio cassettes, Basmati schools in village, field demonstration and visit....Organisation de relais de vulgarisation avec des "Basmati Mitra (friend)" et des Basmati Sandesh".
 - Supply of high quality inputs
 - Seeds production and multiplication.
 - Since 1988 under the supervision of Haryana Seed State Agency
 - Only HBC 19 and PUSA BAS 1 (hybrid)
 - Distribution on "No profit, No Loss" basis
 - People from Pakistan come to buy seeds (better quality, cheapest price on the market)
 - Paddy coupon scheme: making rice transactions transparent and traçability.
Coupons are used for rice purchase between commissioner and farmers. Coupon has 2 parts. Commissioner fills one part, farmer the other one, with information on quantity of rice purchase, price... and each of them send his part to TILDA. At merchandise receipt, TILDA checks the two parts of the coupon. If mismatching, commissioner is charged with penalties. Each bag is controlled and can be followed since the field.
 - All FACE's services are free except seeds supply.
No obligation for farmers to sell their production to TILDA.
 - Prices are 12-13 Rps for basmati (20 last year), 6-9 Rps for coarse grain. Subsidies are only on coarse grains.

- FOSTER activities
- Objective : Making Basmati cultivation a profitable enterprise
- Program set up in 2000
- Innovation process :



- Main problem : actual yield of Basmati (2.5 T/ha) is below achievable yield (3.5 T/ha)
- Main constraints :
 - Insects (Brown Plant Hopper)
 - Disease (Blast)
 - Lodging
 - Less turn around time for wheat cultivation
- Researches carried out with support of Indian research institutes and universities but also with IRRI (International Rice Research Institute) and ICRISAT ().
 - Influence of planting time on HBC 19 (<15/07 to much give growth causing lodging, >15/7 neck blast attack : yield loss up to 50%)
 - Integrated Crop Management
 - Impact of crop rotation
 - Direct seeding (row seeder, dry seeding with driller...)
 - Fertilisation management
 - Mechanisation (transplanting machine, combined harvester...)
- Achievements :
 - Adaptation of leaf color chart for Basmati
 - Green manuring...
- Further research :
Control lodging

➤ Processing and quality control

- Processing line capacity : 20T/hour
- Colour sorting
- No blending. Basmati label applied only to HBC19 batches not to PUSA BASMATI.
- Quality control of every bag entering the plant. Complete traceability from farmers to consumers. Aroma assessment by sensory analysis.

➤ Miscellaneous

- No hybrid, No GMO. TILDA, among others, has asked Indian government to forbid genetics researches with Basmati rice.
- Profitability of Basmati cultivation: Basmati rice is profitable unlike some people are saying. Area under Basmati cultivation is still expanding despite yearly fluctuation caused by price fluctuation (12-13 rupee/kg this year, 20 rupee/kg last year)
- TILDA tries to regulate those fluctuations to ensure consistent supply.
- What would happen if Basmati consumption increases: farmers will shift from semi-dwarf high yielding varieties to Basmati.
- "Terroir" effect : not much. Sometimes problem of chalkiness.
- GI approach: TILDA is in favour of such approach.

APEDA. Mr KS Money, chairman

December, 13. New Dehli, meeting together with Pascale Fleury, French Embassy.

- APEDA was leading together with AIREA the battle against the patent on Basmati rice varieties issued to Rice Tech by US Patent and Trademark Office (1997) and against the trademark "Texmati" and "Kasmati".
- APEDA aims at ensuring quality of Basmati rice exports.

- A team of experts under the supervision of Hyderabad Institute of Genetic Resources (institute under the umbrella of ICAR which is the Indian Council for Agricultural Research) was appointed to establish standards for Basmati production. These definitions were given by a special act in front of Parliament by minister of agriculture.
 - Definition of Basmati varieties (in the seed Act):
 - Landraces (6)
 - Evolved = at least 1 parent is a Basmati landrace
 - Identification of cultivation areas : Haryana, Punjab, Uttar Pradesh, Kashmir...
- Main issue is adulteration. Pure Basmati only contains landraces variety. Adulteration is very common both on domestic and international markets. In UK it can reach 60%. Adulteration is made either with evolved Basmati or with non Basmati rice. Usually, adulteration is an agreement between exporters and importers.
- Tools to ensure purity and genuineness of Basmati rice :
 - DNA fingerprinting makes it possible to identify non-basmati rice from basmati as well as evolved basmati from landraces
 - Traceability system to assess how much Basmati is grown and which quantity enters the market
 - Production of certified seeds
 - Creation of a Basmati Export Development Foundation
- APEDA negotiates also with exporting countries on the establishment of a common procedure to ensure quality of Basmati rice at both sides of export chain.
- With Europe, main constraint is the duties on Basmati export. There is an agreement between India and EU dated August 2004 which provides India with duties facilities on Basmati Rice but only on brown rice in exchange of good control test (DNA test) provided by India for certification of Basmati Rice. Exporters prefer exporting cargo rice which is then polished in European countries mainly in UK. If India was able to export polished rice, it would be easier to control quality.
- GI project on Basmati by Heritage association must be lobbying action from farmers or traders groups, not considered very serious by APEDA.
- Indian government wants first to discuss the issue with Pakistan because Basmati is common heritage of both countries. APEDA is in dialogue with Pakistan for the recognition of a GI.

4. SYNTHESIS REPORT:

4.1 FINDINGS AND QUESTIONS ABOUT TECHNICAL SPECIFICATIONS FOR BASMATI RICE'S IG.

Specifications are one of the main components of a GI registration application. Specifications give 1) the description of the product, 2) details on the production processes from farmers to consumers 3) the delimitation of the production area with justification of the relationships between product characteristics and this area. Once established, these specifications must be strictly respected by all the parties involved in the elaboration of the product under GI.

In this section, at the light of information collected during the mission and in literature, we discuss the technical components of specifications for Basmati rice stressing critical issues to the GI approach.

What is a basmati variety and what are the specific characteristics of Basmati rice?

Definition of what is or not a Basmati variety appears to be a critical and controversial point especially to the issue of adulteration, i.e. the blending of Basmati rice with non basmati. Adulteration is a common practice in domestic and international market. In Europe blending can reach 60% of non-Basmati rice.

For the people interviewed, Basmati rice varieties are mainly characterised by their strong, pleasant aroma. Actually, the name Basmati comes from the Sanskrit word *vasay* meaning aroma. The others specific quality features of Basmati rice are:

- grain shape : long, slender
- elongation rate after cooking : at least 1.5 times length-wise compared to non-cooked rice's length
- soft texture

Those quality features are recognized being all characteristic of Basmati (Bhattarajee et al. 2002; Rani and Krishnaiah. 2001; Singh et al. 2001; Singh. 2000). No single criterion can distinguish Basmati rice from other rice (Singh, 2000). Minimum acceptable standards for some quantitative chemical, physical and sensory parameters of Basmati rice grain have been proposed by experts (Singh et al. 2001).

Officially, the Seed Act and APEDA recognize only six traditional Basmati varieties (or landraces) : Basmati 370, Basmati 386, Basmati 217, Taraori Basmati, Type 3, Type 6. For evolved varieties, Basmati appellation can only be given to varieties which have at least one parent being a Basmati landrace like Pusa Basmati 1. GMO and Hybrid varieties (even if they derived from one Basmati landrace) cannot be accepted as Basmati varieties. For trade, label Basmati can only be applied to pure landraces. Evolved Basmati cannot be sold as Basmati. In this condition, adulteration also concerns blending of Basmati landraces with evolved Basmati. A DNA fingerprinting method has been developed to identify Basmati landraces from other varieties (either evolved Basmati or non Basmati) and is applied to check every batch of rice exported ensuring that only pure Basmati is shipped to others country.

At the "field" level, use of Basmati name is more confused. It is given to either traditional (landraces) varieties or evolved varieties with higher yield potential or even hybrid varieties providing those varieties show above grain characteristics. Hence any variety or blending of those varieties is apparently sold as Basmati rice. Nevertheless all those varieties don't have the same quality. Thus, Pusa Basmati 1, the most famous evolved Basmati variety, is said having very slight or even no aroma.

Based on the information we collected, we may questioned whether the production of Basmati landraces is enough to satisfy the demand. In Karnal district, a main contributor to Basmati total production, Basmati landraces cultivation accounts only for 30% of total Basmati acreage. The remaining 70% are mainly covered with the evolved variety Pusa Basmati 1. Assuming this rate valid for whole India's Basmati area (about 750 000 ha), and given an average paddy yield of 2.5T/ha and processing yield (polished rice/ paddy) of 0.65, we can estimate a total Basmati landraces production of 365 000 T (polished rice) per year. This figure is far below the 850 000 T exported on average the last 3 years (APEDA) which moreover doesn't take in account domestic consumption. If we consider that the gap between production and exports of pure Basmati is filled with non-Basmati landraces, it means adulteration rate is at least about 40%.

The main question rising from this calculation is: May blending of Basmati landraces with evolved Basmati varieties in some proportion acceptable? We can wonder whether non Indian consumers who are not from rice eating traditional countries (Europe, US...) are really able to make the distinction between pure Basmati landraces and a blend of landraces and evolved Basmati. Even in India, we

have been said that Indian people would rather buy a blend of high quality Basmati and more ordinary rice than pure Basmati rice because the latter is too expensive. If permitted this blending should be strictly controlled.

What are the “good” production practices, from seeds to final product, to be applied to ensure a type of quality for Basmati rice?

Cultivation/Pre-harvest processes

From an agronomic point of view, Basmati landraces fall into the group of traditional rice varieties in contrast to improved varieties. They are characterised by tall plant stature, long crop duration due to photoperiod sensitivity, low response to high fertiliser doses, and high susceptibility to lodging, pest and diseases.

Because of those characteristics cultivation of Basmati landraces should follow some rules in order to obtain the best yield with good grain quality:

- Season: due to photoperiod sensitivity, Basmati varieties should be crop during the rainy season. Time for sowing nursery/planting the crop is critical.
- Fertilisation: high doses of nitrogen fertiliser induce lodging and affect negatively grain quality. Use of organic fertiliser is recommended.
- Leaf pruning: cutting of the upper part of the leaves about 40 days after transplanting helps in preventing lodging without affecting quality.

Out of these recommendations any cultivation practices could be applied providing specific grain characteristics of Basmati are preserved.

Seeds production appears to be the main issue at that level. Seeds of Basmati landraces are almost not produced through the official seed production system. Production of certified Basmati seeds is absolutely necessary to ensure yield and grain quality stability over time.

Processing/Post-harvest processes

Processing of Basmati rice is characterised by:

- Ageing, i.e. milling after several months up to one year storage. Ageing is necessary to give specific cooking quality of Basmati.
- Soft polishing in order to limit broken grains.
- Sorting by colour sorter in order to obtain head rice with minimum impurities.
- Parboiling. This pre-milling treatment is required for exporting to some countries but according to Bhattacharjee et al. (2002), this process eliminates aroma. So we can wonder whether parboiling is an acceptable method for high quality Basmati rice.

Basmati rice for European Union is exported as cargo rice due to lesser duties for cargo rice than polished rice. Polishing is then made mainly in U.K. For the persons we interviewed blending of Basmati rice with non-Basmati rice is made at this stage of the commodity chain. In the specifications of a GI application, the place where the produce is process could also be specified. In this case, full processing in the production area is better to ensure product traceability and limit adulteration.

What is the specific geographical area for Basmati rice production and what is the link between this area and specific quality of Basmati?

The current area of Basmati production spreads over the states of Haryana, Punjab and Uttar Pradesh. This area has been recently delimited by APEDA as the official zone for Basmati production. According to this delimitation, Basmati rice cultivated outside cannot be labelled as Basmati.

Nevertheless, grain quality of Basmati seems not to be uniform within this area. It is better in the genuine area of origin of Basmati located at Himalaya's foothills in Uttar Pradesh and Punjab, and decrease as we move away from this area. This variation in quality is said to be mainly due to temperature. Indeed, cool temperatures during grain ripening are well known to benefit grain aroma (Itani and Fushimi, 1995). Soil type is also assumed having an effect on grain quality but until now this effect hasn't been thoroughly studied.

Definition of the criterion used for delimitating the geographical area under GI protection is often a weak point of many GI applications (Avelino, 2002). This weakness is used by opponents for GI who argue that GIs are only a marketing strategy to protect products without any particular quality and that Basmati rice can be produce with the same quality anywhere in the world.

So, in our opinion, together with the question of what is or not a Basmati variety, the determination of demarcation criterion is the main issue remaining to be solved within the frame of the GI application for Basmati rice. A related issue concerns the way of controlling the origin of rice. As DNA fingerprinting

has been developed for detecting variety adulteration, one should develop an analytical method capable of identifying the geographical origin of a rice batch.

Questions raised:

Within a GI application, the specifications give the description of specific characteristics of the protected product and the way to obtain this product with these characteristics. Regarding Basmati, specific quality features of the grain rely mainly on the genetic potential (i.e the variety) and the growing conditions. Cultivation practices have apparently only a secondary effect on grain quality build up.

From our point of view, definition of what is a Basmati variety and delimitation of the specific geographical area for Basmati cultivation are still problematic. Both issues should be clarified to strengthen GI application for Basmati rice. This requires some R&D works on which CIRAD's teams are working at the moment and can bring some expertise:

- Consumers' surveys in order to understand what Basmati quality is for consumers. This work is important to the issue of adulteration and should provide an answer to the question on whether blending of Basmati landraces with evolved Basmati is acceptable or not.
- Definition of quality features and standards especially for aroma. Present knowledge on the biochemical make up of rice aroma is quite poor. Only molecule, 2-acetyl-1-pyrroline (2AP) has been identified being characteristic of rice aroma. Variation in 2AP concentrations cannot explain the distinction made by sensory panels between Thai aromatic rice and Basmati rice. The purpose of this work is to find out which volatile compounds are specific of Basmati rice.
- Development of a reliable routine method to assess rice aroma. Such a method is required 1) to assess the effect if any of new cultivation practices or post-harvest processes on aroma, 2) to control geographical origin of rice. Application of Near Infrared Spectrometry (NIRS) to aroma assessment is the most promising method (Laguerre, 2005)
- Determination of agro-environmental factors affecting grain quality. This work is essential for defining criterion for demarcation of the specific geographical area for Basmati rice cultivation. It requires some specific competences on the analysis of the relationships between parameters describing soil and climate, crop growth and development, and grain quality traits.

4.2 FINDINGS AND QUESTIONS ABOUT LEGAL PROTECTION OF BASMATI RICE'S

A GI application has been filed in August 2004 and is still under examination process. And this other negotiations with Pakistan are hold by Indian Government to protect the word Basmati. So, on this aspects of protecting the denomination "Basmati", which can be eligible for geographical indication protection according to Trips Agreement as article 22 of Trips is not restricted to geographical names, several points should be questioned:

- **What about the pending GI application on the denomination "Basmati Rice"?** (Application n°14 under pre-examination status). Are the applicants legitimate in their application? How will be settled the Consultative Group by the GI registry? Which members? How will be monitoring the examination? What about the possible opposition? What about the kind of protection if the additional protection has not been asked by the applicant?
- **What about the common concern shared between Pakistan and India to protection Basmati as a common GI whereas Pakistan does not have any legal provisions on GI yet?** Protection trough bilateral agreement and trough application of laws?
- **What about the relationship between the legal protection of the plant varieties and the legal protection of the geographical denomination?** Is the definition of the varieties authorised by India to be called Basmati based on any legal document? Are the varieties listed in the actual application as Basmati varieties the same as the varieties listed by seed Act?

- **What about the protection of the denomination Basmati Rice in third countries?** In particular which links are in place between commercial agreements on trade and duties and the recognition of GI in countries like EU.

In fact, according to the Agreement between India and EU, EU has recognised only 7 varieties of basmati as traditional and was prepared to render duty derogation on its imports, out of which two, namely Basmati-370 and Karnel are from Pakistan and five from India, namely, Basmati-370, Basmati-386, Type-3 (Dehraduni), Taraori, Basmati-217 and Ranbir Basmati. Below are some extracts of the agreement:

“With respect to the import regime of husked rice of the varieties Basmati 370, Basmati 386, Type-3 (Dehradun), Taraori Basmati (HBC-19), Basmati 217, Ranbir Basmati, Pusa Basmati and Super Basmati, the EC's specific bound rate of duty shall be zero. To that purpose: A Community control system based on DNA analysis at the border shall be created; India shall actively cooperate with the EC to set up such a control system and the EC shall provide the appropriate technical assistance in this matter. It is understood that Basmati rice of the varieties described above is produced in certain geographical areas and that India will protect Basmati rice as a geographical indication. The EC would welcome an application for protection as a geographical indication of Basmati rice under Council Regulation (EEC) No 2081/92 of 14 July 1992 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs. The EC shall process any such application as expeditiously as possible. The EC shall provide any necessary technical assistance in this matter¹.

- What about the risks of **genericity** of the denomination Basmati in countries like United States? In fact many countries provide in their legal framework that the genericity of a denomination is looked at on the territory where the protection is sought. For example, even if Basmati is not generic in India and Pakistan, to look at this issue, the US Patent and Trade Mark Office will consider the situation in United States itself. Thus it can be considered as generic in US if for American consumers, Basmati does not refer any more to India and Pakistan.

- Besides the stricto-senso legal aspects, all the politics behind what is called the “Basmati Affair” is an important point to look at. In fact, Basmati is still not legally protected as a geographical indication in any country but India succeeded in revocating the US Patent on Basmati thanks to the support of professionals, civil society in India and in Europe. The interesting point being that the government itself organized the defense of the name Basmati, as part of its cultural patrimony, through the involvement of many public authorities in India (research...) as experts.

4.3 FINDINGS AND QUESTIONS ABOUT SOCIAL AND ECONOMIC ASPECTS OF BASMATI RICE SUPPLY CHAIN

- **Dynamics in the rice supply chain : new organizational forms and quality management**

One of the main questions after this survey is to characterize the dynamics actually working in the supply chain organization.

- Is the “**Tilda model**” a new type of organisation allowing big companies, millers and traders, to control their supplying and the quality of the production? How these new relationships between supply chain agents (producers, commission agent’s millers and traders) allow new types of regulation of the supply chain?

What are the consequences of this type of integration of the agriculture by millers and traders with contracts (even if in the Tilda case, there is no formal contract, it could be interesting to understand better the links between rice producers and the supply chain actors) ? These consequences could be analysed about market segmentation, market prices, payment ways to the producer, new regulations and organizations.

¹ Agreement in the form of an Exchange of Letters between the European Community and India pursuant to Article XXVIII of the GATT 1994 relating to the modification of concessions with respect to rice provided for in EC Schedule CXL annexed to the GATT 1994, *Official Journal L 279*, 28/08/2004 P. 0019 - 0022

It's interesting to notice that Gay and Lançon have found the same dynamics in the rice supply chain, specially in the exporting sub-chain, in Vietnam : *“The liberalization of the rice exports and the increasing pressure for improving the efficiency of the miller/exporter have simulated **organizational innovations** through the implementation of direct linkages between millers/exporters and rice producers. These direct linkages consist in providing quality seeds to farmers in order to recover a raw material of good and homogenous quality for processing. These innovations are associated with the development of aromatic rice exports...”*

-The rice market segmentation needs a **better understanding of the competition and complementarily phenomena** between various rice qualities and between various sub-chains. Is it only for the export markets or also for the internal market? For example, we have noticed specialized shops along main road in Haryana selling only Basmati rice. Does it mean there is a special market locally for basmati rice with specialized stakeholders, different with the standard rice market? This is also need to better understand the consumer's behaviour about the different qualities of rice.

-To understand the dynamics in the rice supply chain, it is also important to better know **actors strategies at the different chain levels**. After the field visits we have made, we have for example questions about farmers strategies. People told us that farmers were leaving basmati rice cropping because of both technical and financial constraints. It seems that income per hectare is lower with basmati than with standard rice; especially in areas where 2 standard rice crops a year are available. This first statement needs to be corroborated by new surveys with farmers and analyse it making typologies of the different strategies. Another point is to understand where are made the technical and economical arbitrations: who is making it, on what criteria? Who manage and how is managed the rice qualities? (including the questions about frauds as mixing qualities and selling it as basmati).

- A geographical indication on Basmati rice ?

We have noticed 3 main research questions which emerge after this preliminary field visit:

- Basmati rice in India is an emerging situation. In this sense, it is an interesting case study to observe the technical and organizational innovations on how it emerges and to analyse the **emerging conditions for a GI in the Indian context**. In these emerging conditions, a particular interest has to be on **the producer's organizations and their part in the GI creation process**.

- Basmati rice is also a good case to study on a rural development aspect. What are the consequences of a GI creation, what are the **development effects**? Methodologies on this item are actually developed in Europe (European Siner-GI² project) and could be used on this case, interesting because of the international reputation, because of a basic product for the people, the rice, because it's one of the main crops in this area and so on an important income for the farmers.

- Another question is on the institutional and political context in India. How the GI system is implementing in the **public policies** at the different levels (federal, state, local)? What kind of new organizations and institutions are appearing in this process? The fact that Basmati is an international product at two levels, i) production level between India and Pakistan, ii) consumption level worldwide in countries with different recognition systems for GI, make it very interesting to study at an international level.

² Strengthening International Research on Geographical Indications : from research foundation to consistent policy – European project with INRA (coordinator), CIRAD, AGRIDEA (SW), Un of Firenze (It), Un of Parma (It), Un of Wageningen (Nd), Un of Newcastle (UK), Un of Edimburgh (UK), Un of Latvia (Lat), ENITACF (F), ORIGIN (international professional NGO) www.origin-food.org

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