GOVERNMENT POLICIES AFFECTING THE INDONESIAN CORN SEED INDUSTRY: A CASE STUDY IN EAST JAVA

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INTRODUCTION

The seed industry is a complex system of organizations, institutions, and individuals related with the seed program of a country. The commercial seed industry consists of individuals, seed firms, and marketing groups involved in producing and marketing seeds for sale to consumers (Douglas, 1980).

In Indonesia, the commercial seed industry started to develop in 1970 when the government established a modern seed industry through Seed Project I assisted by the World Bank. This project was intended to supply high quality seed of suitable varieties to the farmers (Bastari, 1995). In 1971 the government established the National Seed Corporation, i.e., PT Sang Hyang Seri, to produce quality seeds. The seed multiplication program for paddy and other major cereals is mainly intended to increase domestic food supply, to increase the production of agricultural export products (especially estate crops), to create rural employment opportunity, to conserve natural resources, and to improve land productivity. PT Sang Hyang Seri produces and distributes the extension seeds, i.e., seeds that will be planted directly by farmers.

Cromwell et al *(1992) classified the seed system into two sectors, namely, the formal seed sectors and the traditional seed sectors. The formal seed sector includes the various institutions involved in the multiplication, processing, and distribution of improved seeds (Walker, 1980 in* loc .cit*). The government in the late 1960's initiated the formal seed system.*

The traditional seed sector includes systems by which farmers can get their seed requirement, retain seeds on-farm from the previous harvests, and seed exchange among farmers based on barter or social obligation. This system is common in developing countries like Indonesia. Traditional seed system exists in areas where the farmers can produce the seeds by themselves and the yields of their own seed are at acceptable levels.

Objectives of the paper are (i) to describe the government's ordinances dealing with the seed industry, (ii) to assess conducts of the National Seed Agency and its related institutions in controlling production and marketing of corn seed in East Java.

GOVERNMENT'S ORDINANCES RELATED TO SEED INDUSTRY POLICY

Early Stage of Formal Seed Industry

In 1971 the government issued Presidential Decree No. 27/1971 as the legal basis for the establishment of the National Seed Board (NSB)[1]. This board is under the control of the Minister of Agriculture. General function of the NSB is to assist the Minister in planning and preparation of seed policies. The specific tasks of the board are: a) to plan and formulate government regulations on seed production and marketing and; b) to propose policies related to seed regulations including establishment or abolition of a type, variety, quality of seed, and control of seed production and marketing (Presidential Decree, 1971a).

To implement this Presidential Decree, the Minister of Agriculture issued Regulation No. 461/1971 on the organizational structure, job description, and working rules of the NSB. The structure consisted of the Secretariat, Team of Assessment and Release of Variety, and Team of Establishment, Control, and Certification (Decree of Minister of Agriculture, 1971b). Former officials of the NSB were chosen based on the Ministerial Decree. In 2001, a new set of NSB officials were installed based on Ministerial Decree No. 3663/2001 to replace the former board inducted in 1996. The Director General of Food Crops was assigned as the chairperson of the NSB. The positions for the vice chairs were held by the Director General of Horticultural Crops and the Director General for Estate Crops. The members came from institutions under the Ministry of Agriculture and related organizations (Decree of Minister of Agriculture, 2001).

In 1971, Presidential Decree No.27/1971 was enacted for the establishment and control of seed marketing, seed certification, and setting the standards for imported seeds. All of these policies related to seed crops were under the authority of the Minister of Agriculture (Presidential Decree, 1971b). To implement the seed policy nationwide based on the said Presidential Decree; the Minister of Agriculture issued Decree No. 461 (Decree of Minister of Agriculture, 1971a).

Even though officially the Minister of Agriculture officially still has authorities in control of seed marketing, seed certification, and setting standards for imported seeds, but in reality the Minister's authorities are reduced. Currently, the Ministry of Agriculture has been expanded to three Ministries, i.e., Agriculture, Forestry, and Marine and Fisheries Affairs. Thus, all seed of fisheries and forestry commodities are beyond authorities of the Minister of Agriculture. It is necessary to set a formal act authorizing those Ministries to deal with respective commodity seed.

[1] Badan Benih Nasional (BBN)

Seed Trade

The Act on Crops Practice No. 12/1992 was endorsed on April 30, 1992. This act regulated the implementation of crop' practices in general including land preparation, crop growing, crop protection, crop maintenance, among others. Seed issues are specifically described in chapters 8 to 17 of the Act. The focuses of the chapters are developing high yielding varieties, introduction of varieties from abroad, seed export, release of varieties, seed certification and distribution. Chapters 60 and 61 deal with sanctions for violating the Act. For example, selling seeds without label will be fined the maximum amount of Rp 250 millions, equivalent to US $ 25,000 then or almost US $ 27,000 in 2005. It also explicitly mentioned that seed distribution not in accordance with its label is punishable. It was also prohibited to certify seeds without the needed license from the authority (Act No. 12, 1992).

Following Act 12 of 1992, the President enacted the Indonesian Government's Regulation No. 44/1995 on crop seeds that covered the utilization of germplasm resources, introduction of seed and clones from abroad, examination and release of variety, production and distribution of high-yielding commercial variety. For instance, seed introduced from abroad is subject to the Minister of Agriculture's approval. Releases of high-yielding varieties could be implemented after approval of the Minister (Government Regulation, 1995).

Trials, assessments, and releases of new varieties were carried out based on the Decree of Ministry of Agriculture Nos. 902/96 and 737/96. The decrees outlined how to release new varieties whether they were results of domestic breeding or imported from abroad. A new variety is established as a high yielding variety after field adaptation tests subject to the assessment of experts. The new varieties had to be tested for several seasons and locations, and units of trials in accordance with the type of the plants. The varieties of plants most affected by the consumers' preferences, like ornamental crops, could be exempted from adaptation or observation tests. Adaptation test could be conducted by the Seed Control and Certification Services, the Assessment Institutes for Agricultural Technology, the breeding agencies, or private institutions collaborating with the Breeding Agencies (Decrees of Minister of Agriculture, 1996 and 1998b).

The Decree of Minister of Agriculture No. 803/97 dealt with certification and control of high-yielding commercial seed. Seed certification was intended to guarantee purity and genuineness of varieties, and to assure the continued supply of quality seeds. It was intended for the seed propagated from breeder seeds that are classified as foundation seeds, stock seeds, and extension seeds. Breeder seed are seeds produced by and under the control of plants breeders. Foundation seed is the first descendant of breeder seed. Stock seed is the first descendant of the basic seed or breeder seed. Extension seed is the first descendant of the stock and foundation seeds. Hybrid seed is the result of cross breeding and is classified as extension seed. The Seed Control and Certification Service is authorized to

conduct seed certification for food and horticultural crops (Decree of Minister of Agriculture, 1997).

Licenses for high-yielding commercial seeds, seed imports, and export of high-yielding commercial seeds were arranged through the Ministerial Decree 1017/98. Commercial seed production can be undertaken by individuals, legal institutions, or government agencies. The capital for seed production may belong to Indonesian individuals or companies, joint ventures, or be fully owned by foreign investors. The producers are subject to annual inspection conducted by the appropriate Directorate Generals.

Seed importation can be done by individuals, legal institutions or government agencies. Licenses for seed import are issued by the Director General of Agency for Agricultural Research and Development (AARD). Importation is allowed either for research or non-research purposes if the seed is not available in the country and subject to laws on plant quarantine.

Seed exports can be done by individuals, legal institutions, or government agencies subject to the issuance of a license from the concerned Directorate General. Seed export is allowed if the domestic seed supply is sufficient, the seed production is intended for export, and the seed meets the quality standard established by the Minister of Agriculture (Decree of Minister of Agriculture, 1998a).

It is necessary to establish the rule requiring domestic production of imported seed. The imported seed that is produced domestically will encourage domestic seed industry growth. Furthermore, the country will also gain value added from the domestically produced seed.

Seed Certification

For the implementations of the Ministerial Decree 460/1971, the Director General of Food Crops in 1984 issued a Decree dealing with the procedures of seed certification and its requirements. Under the decree, seed certification was carried out by the Seed Control and Certification Service (SCCS)[2] that include the foundation, stock, and extension seeds. The decree described the requirements for seed certification including certification areas, application for certification, field inspection, control of seed processing and storage house, seed sampling, laboratory test, and labeling (Directorate General of Food Crops, 1984). The decree also described how to certify composite and hybrid corn seed and included field inspections, processing equipment checks, labeling, and standards of field isolation and laboratory test. The seed labels were valid for 6 months after the date of laboratory assessment or not more than 8 months after harvest. For certification purposes, the composite corn seed had to pass the following: (i) a maximum

[2] Balai Pengawasan dan Sertifikasi Benih (BPSB)

moisture content of 12 %; (ii) a minimum pure seed content of 98.0 %; (iii) a maximum dirt content of 2.0 %; (iv) a maximum seed of other varieties of 0.2 %; (v) a maximum seed of other colors of 1.0 %, and (vi) a minimum germination rate of 80 %. The requirements for hybrid corn seed certification were the same with the composite seeds except for a higher minimum germination rate of 90 %.

On July 5, 2000, the Director of Food Crops Seed issued a memorandum to all Heads of the SCCS in the country about seed producers who were given the authority for seed certification. The circular referred to the certificates issued by the Agency for Quality System Certification of Food Crops and Horticulture Seed (LSSM BTPH) on March and April 2000. Six seed producers received the certificates, namely: (i) PT Benihinti Subur Intani (BISI) in Kediri district, East Java, for the composite rice seed, hybrid and composite corn seed, and horticulture seed; (ii) PT Pioneer Hibrida Indonesia (currently PT Dupont Indonesia) in Malang district, East Java, for hybrid corn seed; (iii) PT Pioneer Hibrida Indonesia (currently PT Dupont Indonesia) in Kabanjahe, North Sumatera for hybrid corn seed; (iv) PT East West Seed Indonesia in Purwakarta, West Java, for horticulture seed; (v) PT Sang Hyang Seri UBD Sukamandi, West Java, for composite rice seed only; and (vi) PT Fitotex Unggul, Jakarta, for horticulture seed.

The certificates authorized the seed producers to label their own seed products without getting approval from the SCCS subject to standard requirements established by the Directorate General of Food Crops in 1984. The tasks of the SCCS for these seed producers were limited to external controls such as gathering data on seed growing areas and seed production. The certificates were valid for two years that could be renewed for another two years after the assessment of the LSSM BTPH. On March and April 2002, the LSSM BTPH extended the certificates of the six seed producers (LSSM, 2002).

Despite the authority for seed certification awarded to PT BISI and PT Dupont Indonesia, the SCCS in East Java was still authorized to certify seed produced by the local producers including the products of PT Sang Hyang Seri. The seed producers had to apply for seed certification 10 days before planting the seed crops. The costs of seed certification were Rp 2,000 per hectare for hybrid corn seed and Rp 1,500 per hectare for the composite corn seed. The steps for seed certification had to be followed subsequently by the seed producers including the payment of all fees for laboratory test and re-labeling (Table 1; SCCS Malang, 2002b).

Seed certification awarded by the LSSM BTPH implies that the government gradually adopts market mechanism. Based on periodic assessment, the seed producers need not rely on seed certification implemented by the SCCS but they label their seed products by them selves. The consumers will determine whether the seed certified by the LSSM BTPH satisfy the standard quality. On the other hand, this policy also reduces costs of seed production.

Table 1. Steps of Seed Certification in East Java, 2002

Activities of seed producer and trader	Steps of seed certification	Activities of seed control staff
Application for seed certification (10 days before planting), attached with the label of seed source and the map of location.	1. Seed bedding preparation	Preliminary field inspection (before seed planting) includes seed source, records of field, location, and isolation.
Cost of certification: a. hybrid corn seed: Rp 2,000 per ha b. OPV corn seed: Rp 1,500 per ha	2. Planting	
Application for field inspection (one week before inspection)	3. Vegetative phase	Field inspection of stage I
Application for field inspection (one week before inspection)	4. Generative phase	Field inspection of stage II
Application for field inspection (one week before inspection)	5. Mature phase	Field inspection of stage III
Application for inspection of harvesting and processing equipments (one week before inspection)	6. Harvest and processing	Harvest monitoring and harvesting and processing equipments
Application for seed sampling (one week before sampling).	7. Seed lot arrangement and seed sampling	Seed sampling for the information written on the label
Cost of laboratory examination is Rp 3/kg	8. Laboratory examination	Laboratory examination
Application for label printing	9. Seed labeling	Legalization and control of labeling
Application for re-labeling and it costs Rp 3,000 per sample	10. Marketing and quality checking	Seed sampling for re-labeling and marketing monitor

Source: SCCS East Java (2002b)

Crops' Varieties Protection

On December 20, 2000, the government enacted the Act of Crops' Varieties Protection. Through this Act, the plant breeders and the private sector were encouraged to participate in breeding new varieties. Copyrights of the breeders included assigning the name for the new variety, getting royalties, utilizing the new variety, prohibiting others from using the new variety, and handing over copyrights to other parties. The plant breeders had to register the new varieties to the Office of Crop Variety Protection in order to get their copyrights. The variety to be registered must have distinct characteristics that are new, uniform, and stable. New varieties could be transgenic or non-transgenic (Effendi, 2001).

To implement the rules depicted in Chapter 6 verse 7 and Chapter 7 verse 4 of the Act of Crop Varieties Protection enacted in 2000, the government passed the regulation on assigning name, registration, and use of original varieties to produce essential derived varieties. Name assignment, registration, and use of local varieties to produce essential derived varieties have to take account some requirements, such as identities of the local varieties, use no name of nature, use no the country's symbol, and use no trade mark. Related with autonomy era, the Regents/Majors or Governors on behalf of communities owning the local varieties register the local varieties to the Office of Crop Varieties Protection. The next step is announcement made by the Office of Crop Varieties Protection regarding names and registrations of the local varieties (Government Regulation, 2004).

Protection of crops' varieties will ensure that the breeders have copyrights over their invented varieties. If the policy is implemented effectively, the breeders will be encouraged to keep on inventing new varieties.

Seed Producers Registration

All seed traders were required to register themselves with the SCCS. This requirement was intended to facilitate monthly and periodic assessments conducted by the SCCS regarding the volume and type of seeds sold. The seed traders were also subject to an assessment of their germination rate intended to check for expired seeds and seeds with sub-standard germination rates which should not be sold to consumers. The procedure for the enlistment of seed traders are depicted in Table 2 (SCCS Malang, 2002a).

Table 2. Registration Procedures for Seed Producers and Traders in East Java, 2002.

Applicant	Stage of Activities	SCCS
Application is attached with • 4 copies of pictures of 3x4 cm^2 size • plan of seed production for one year of budget	Plan of Seed Production	1. Administration requirements verification
Technical requirements: 1. Sufficient knowledge on seed production and marketing	Seed Multiplication Conduct	2. Appraisal of applicant's technical requirements done by the seed control staff
2. Honest and willing to obey the existing rules	Seed Processing	3. Data typing, controlling, and processing, and allocating registration number
3. Holding land for seed production and able to manage	Seed Examination	4. Verification of Certificate of Seed Producer (SKPB) done by sub coordinator of marketing control
4. Possession of seed processing equipments and holding seed warehouse	Labeling Control	5. Labeling of SKPB done by the Director of SCCA 6. Awarding SKPB

Source: SCCS Malang, East Java (2002a)

The SCCS in East Java was established based on the Minister of Agriculture's Decree 468/Kpts/OT.210/6/94. The main function of the SCCS is to perform portions of the technical tasks of the Directorate General of Food Crops especially in quality seed control. The SCCS consists of 6 working areas of seed control (WKPBs), namely: Surabaya, Kediri, Madiun, Jember, Malang, and Banyuwangi. Each WKPB coordinates 2 to 6 districts in the province. The organizational structure of structure this agency is depicted in Figure 1.

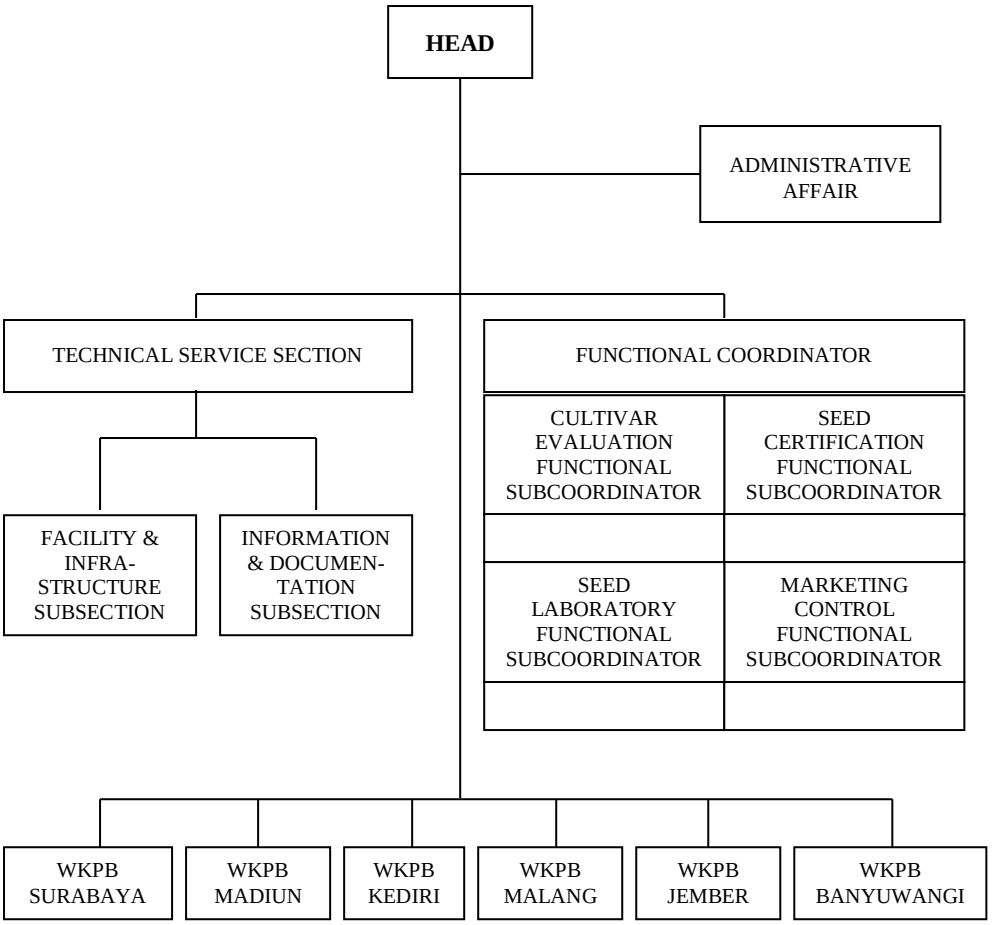

Figure 1. Organizational Structure of the Seed Control and Certification for Food and Horticulture Crops in East Java (SCCS, 2000)

Germination rates evaluation has to be carried periodically and accurately by the SCCS. It is possible that the seed sold in the market do not perform germination rates such as depicted in the label due to some reasons. To protect consumers' interests, all seed sold in the market should be withdrawn by the

producers if the germination rates are below the standard even though the seed have not exceed the expired dates.

THE SEED INDUSTRY SYSTEM

There are four government institutions dealing with the national policies on seed industry. They are the National Seed Company, PT Sang Hyang Seri, the Seed Control and Certification Service (SCCS), the National Seed Board (NSB), and the Food Crop Research Institutes (Figure 2).

The Agency for Agricultural Research and Development (AARD) through its Food Crops Research Institutes (FCRIs) carries out research and breeding activities, especially for rice and secondary crops. There are four FCRIs, i.e. the FCRI Sukamandi (West Java) concentrates on rice; the FCRI Malang (East Java) focuses on beans and tubers; the FCRI Maros (South Sulawesi) or Research Institute for Maize and other Cereals (RIMOC) deals with corn and other cereal crops; and FCRI Banjar Baru (South Kalimantan), concentrated on swamp rice. These FCRIs produce breeder seeds (BS) of rice, corn, and soybean and other secondary crops. Almost all composite and hybrid corn seeds were propagated by RIMOC. The Directorate of Food Crops for rice and secondary crops, which is under Directorate General for Food Crops (DGFC), delivers BS to the Central Seed Farms (CSF) at provincial levels. The CSFs produce BS into foundation seed (FS) and distribute them to Main Seed Farms (MSF) at district levels that produce stock seed (SS) from FS. The CSF's and MSF's are managed by Provincial Agricultural Extension Services. Seed Growers, collaborating with seed producers, i.e., state-owned companies, private firms, or cooperatives, produce extension seed (ES) from SS. Seed propagations from BS into FS, from FS into SS, and from SS into ES are controlled by the SCCS office located in 13 provinces. SS is sent to the seed processing centers, owned by the seed producers, for processing before it is distributed to seed growers. ES produced by seed growers is processed by the seed processing centers before it is labeled by the SCCS prior to its delivery to the seed distributors. The farmers or farmers' groups bought the seeds from the distributors. This seed industry system applies for rice, composite corn, and soybean (Bastari, 1995; and Soemardi, 1987).

The hybrid corn seed production system is different from those of the composite rice, composite corn, and soybean seeds. Commercial hybrid corn seed is classified as Extension Seed that is produced by crossing male and female parent stocks directly. The local seed producers, including PT Sang Hyang Seri, buy male and female parent stock seed from the MSF and grow it to produce hybrid corn seed. The hybrid corn seed produced by the seed producer, either local or multinational, was sold directly to the farmers. In producing hybrid varieties, e.g., C-1, C-3, S-2 and S-3, PT Sang Hyang Seri collaborated with seed growers to produce hybrid corn seed (F1) that is directly delivered to distributors or government projects.

To encourage domestic seed industry progress, roles of the government have to be unambiguous. The government does not need to involve in seed production and distribution. Market system is more efficient in producing and distributing seed as long as the government implements all the rules transparently and fairly.

From now on, roles of the FCRIs in producing new varieties compete with some private seed producers that also produce new varieties by employing their own breeders, especially on commercial crops seed. Furthermore, the fact also shows that the private seed producer is allowed to produce a crop seed variety invented by FCRI, i.e. Arjuna corn seed variety is also produced by PT BISI besides that produced by PT Sang Hyang Seri.

CONCLUSIONS AND POLICY IMPLICATIONS

All laws on seed affairs enacted by the government are mainly affected by the fact that since more than thirty years ago most Indonesian farmers have been dealing with formal seed system rather than the traditional one. Consequently, the government has to protect interests of both seed producers and consumers. From the side of the seed producers, the government established some acts on seed registration, production, and distribution including crop varieties protection. Labeling on seed packages ensures the consumers to get the true characteristics they prefer. The government created a national seed company to initiate and to facilitate formal seed system and established the National Seed Agency to control seed production and distribution. All seed producers are subject to the procedures for seed producer registration, but not all producers are subject to assessment for seed certification. Overtime, the government renews the seed policies along with seed industry progress.

Hybrid corn seed producers mainly dominated by the multinational companies have tight procedures of seed production established by them selves. Seed production process determines seed quality sold to the market. The National Seed Agency and its related institutions, however, have to apply the policies tightly. There are still some possibilities that the seed producers will give asymmetric information to the consumers especially in products marketing, for examples seed labeling and dishonest advertisement. Current more market-oriented domestic corn seed industry requires the government's role to ensure the market competes perfectly for benefits of both producers and consumers. It is also reasonable to question the government policy in maintaining ownership of a national seed company. For example, currently PT Sang Hyang Seri is not only producing and marketing the crop seed generated by the FCRIs. Collaborating with Syngenta from Thailand, PT Sang Hyang Seri has an exclusive right to sell SHS-1 and SHS-2 hybrid corn seed in Indonesia. It reveals that business orientation of the company is not different with the other private seed producers.

It is also publicly known that uncertified hybrid corn seed are sold openly in several regencies in East Java Province. Based on the Act on Crops Practice No. 12/1992 the government is authorized to punish those distribute uncertified seed. The government has to implement law enforcement to protect both producers and consumers.

It seems that in the long run the roles of government's research institutions in inventing new varieties, especially those high economic-values, will decrease gradually along with competition coming from the private seed producers. The FCRIs needs to focus on inventing non-high economic-valued seed varieties where in certain areas are still planted by some farmers.

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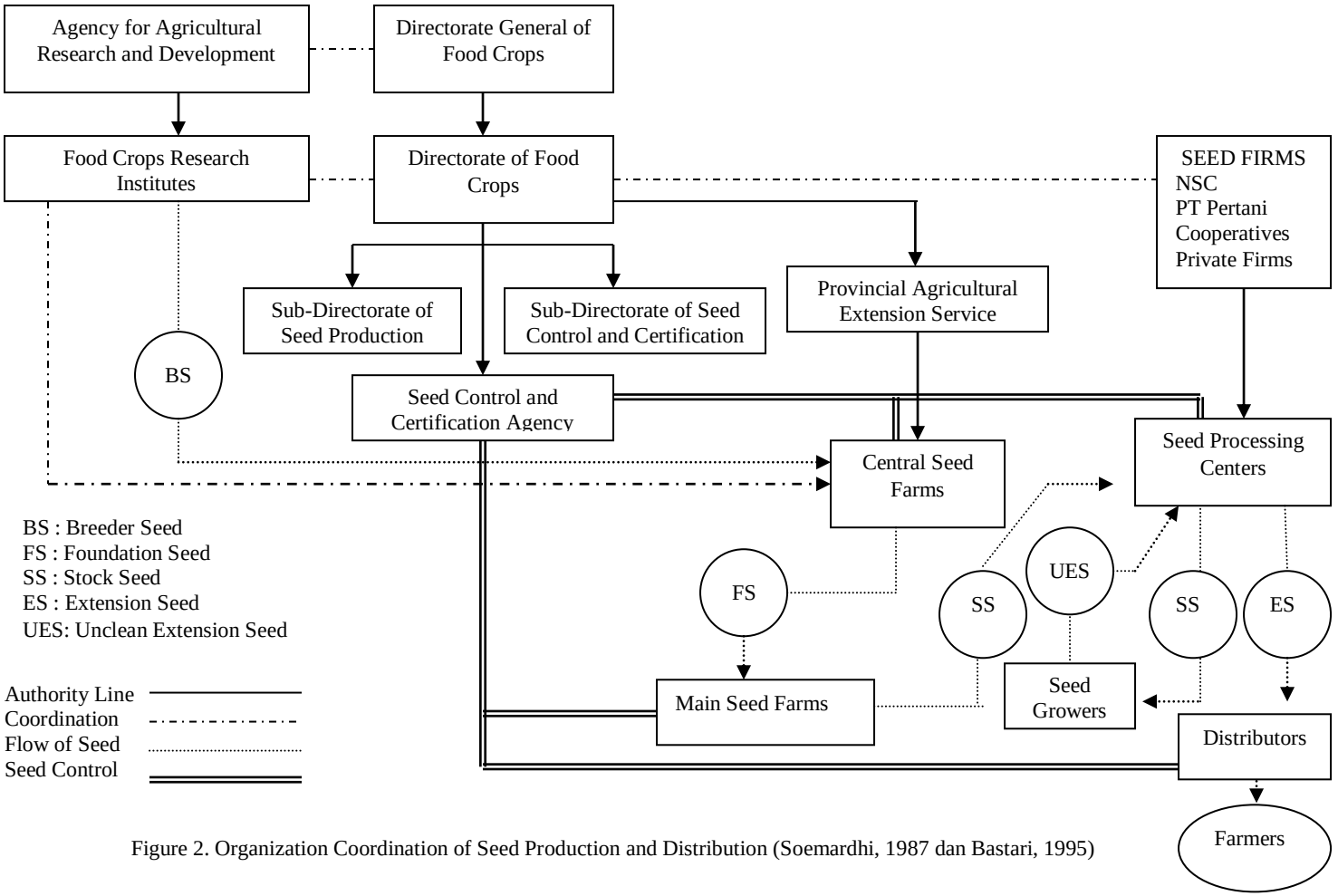

Figure 2. Organization Coordination of Seed Production and Distribution (Soemardhi, 1987 dan Bastari, 1995)