THE DEVELOPMENT OF TECHNO-AGRONOMY AND SOCIAL ANTHROPOLOGY OF FARMERS IN THE TIDAL AREA, BANYUASIN REGENCY, SOUTH SUMATRA PROVINCE, INDONESIA

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Abstract

Along with the times and the increasing population of people living in an area, the land area fixed quantity available. This impacts the emergence of various conflicts of interest for acquiring land (Basic Agrarian Law article 4 paragraph 1) to meet their needs, including housing and carrying out other activities. In the end, this condition will impact the urgency of vacant land, especially productive land that is used as agricultural land and changes its function into a non-agricultural area so that it is no longer productive, resulting in a decrease in the amount of food production. Alternative solutions are needed to anticipate reducing productive lands, including utilizing the land in coastal areas as agricultural land. Of course, to use the land must require different treatment from land in general because of its marginal physical condition and the location of the land is less affordable. Therefore, this study provides an overview of the social changes of farmers, starting from the techno-agronomic and socio-anthropological aspects from year to year.

Keywords: Socio-Anthropological, Techno-Agronomy, Welfare, Tidal Land.

1. INTRODUCTION

Along with Indonesia's increasing population growth rate, the need for food is also getting more significant. The Central Statistics Agency noted that the population growth rate in Indonesia reached 2-3 per cent per year. That means Indonesia's population increases by about 3 million people every year. The high population growth rate requires adding very high rice production, around 2 million tons per year. According to the Directorate General of Food Crops, Ministry of Agriculture (2007), if no special efforts are made, in 2020, Indonesia will experience a food deficit of 9,668,000 tons of rice. Thus, from now on, serious efforts must be made to meet the additional rice production so that our fate does not depend on rice supplies from other countries.

When the dry land areas of the archipelago are becoming increasingly difficult for residents to find, especially for investors in the primary production sector, the wetland ecosystem areas that are suitable for conversion are still available in the number of almost 7 million hectares or even more around the archipelago, and this will undoubtedly become a target for hunting plots of land. Here, the concern should surface, considering that scientific understanding of wetlands is still relatively limited. However, the trend of converting unspoiled wetland ecosystems into agroecosystems (agribusiness land) will accelerate yearly to reach significant numbers far exceeding hundreds of thousands. Up to a million hectares per year. The common logic that wetlands are suitable for rice and oil palm food cultivation is not wrong, but it cannot be very reassuring. Changing the hydro-dynamic balance and stability of vegetation cover in wetland ecosystems (especially in a hydrological unit of peat ecosystem = KHEG) requires careful scientific consideration.

Moreover, the bio-geophysical properties of this wetland ecosystem must vary across regions. The food problem, indeed, is one of the essential issues that will drain the energy of thinking and acting among the citizens of this nation in the future. Therefore, the scope and degree of such problems should have been anticipated so they could be mitigated before getting out of control. Such matters need scrutiny through scientific studies that identify changes in society's agronomic and socio-anthropological technologies.

Techno-agronomy developments in the agricultural sector, especially for rice commodities, have consequences in the lives of rural rice farming communities. These changes are, among others, related to efforts to increase agricultural production and labor efficiency. In addition, changes in agricultural production affect the community's social structure, both from the difference in the distribution of land ownership and the increase in poverty in the village. So that in the end, the emergence of other economic opportunities (non-agricultural) by utilizing techno-agronomy technology as a strategy to increase income. In addition, every society that exists on this earth in their life can certainly experience what is called changes. The existence of these changes will be known if we make a comparison by examining society at a particular time which we then compare with the state of society in the past. The changes that occur in society are a continuous process, which means that every society will experience changes. Every society, living in villages or cities, must experience changes and sociocultural dynamics. These social changes and dynamics result from interactions between humans and people groups. Because people constantly carry out social interactions, social change cannot be avoided. Therefore, it is necessary to also pay attention to the development of socio-anthropological aspects directly related to the community, especially the transmigrant community who depend on the agricultural sector for their lives (Diktina & Arofiati, 2022).

1.1 Theoretical Framework

Sociologists have observed social change for centuries, for example, the emergence of the theory of social change. According to Soedjatmoko, this significant change was caused by three main factors: the development of science and technology. Second, population factors, and third, ecological and environmental factors. The human development of science and technology at this time is truly astonishing. Various technologies have been developed by scientists so that they can change civilization. In addition, the increase in population in an area results in greater utilization of natural resources and if excessive, excessive use can trigger a decrease in environmental quality.

Alternative sub-optimal land use causes improvements, and increases in sub-optimal land productivity can be achieved by improving the agroecosystem of the land using natural materials. Utilization of local resources based on secondary vegetation and agricultural waste that is widely available and has not been utilized optimally can be used as an alternative to overcome the limitations of sub-optimal land. With appropriate technology, these local resources can be processed into biotechnology products in the form of Compost plus Fertilizer, which combines organic fertilizers and biological fertilizers, and is a slow-release, economical, and environmentally friendly fertiliser.

2. METHODS

The research was conducted in Banyuasin Regency, South Sumatra Province, which was determined by purposive sampling. This is because Banyuasin Regency was the first transmigration area in South Sumatra in 1969, consisting of 25 families from East Java and 25 from West Java. The data collected is primary and secondary. Primary data collection began on January 20, 22 s / d June 2022, through interviews equipped with questionnaires. The method study used in the study is history using heuristic techniques. Heuristics is t technique for collecting data from the source, sound sources, and primary or secondary sources. Study document sources could be based on various sources, good oral and writing. In studying this, source documentary Among other: list name income g, map region which there is since arrival transmigration year along Interviews with people contemporaries with events time then. Well Public direct nor inhabitants around in the tidal trans migrant area.

3. RESULTS AND DISCUSSION

To realize food sovereignty, tidal swamp land as a land resource can be used optimally as a source of food production growth to achieve this target. However, it needs to be supported by reliable technological innovation because tidal swamp land generally has several characteristics that make it challenging to manage. According to the Information and Geospatial Agency, Indonesia's land area is 1,922,570 km 2, equivalent to 192.2 million hectares. The distribution potential in Indonesia is 33.40 million hectares. Consists of 23.05 million hectares of tidal land and 10.35 hectares of lebak swamp, with the potential for agricultural businesses covering an area of 10.90 million hectares (Directorate General of Food Crops, Ministry of Agriculture, 2018), which has been reclaimed for agriculture and settlements of 4,17 million hectares.

In general, swamps, especially tidal areas, are spread over Sumatra, Kalimantan, Papua, and Sulawesi islands. Food production needs to be increased along with the increasing demand because the population is increasing. In 2018 the need for rice for consumption was 29.6 million tons. The number of rice imports fluctuated, whereas in 2018 rice imports reached 2.25 million tons. The tidal swamp area contributes significantly to the increase in rice production, mainly due to the expansion of the area and the increase in the productivity of the tidal land. The tidal land area potential to be used for agricultural land is 961 thousand hectares, consisting of 359.20 thousand hectares used as reclamation land and 276 thousand hectares used as transmigration settlement land. Tidal swamp areas have been developed for a long time by local communities for agricultural activities. However, the development of tidal swamps in Indonesia has been overgrown since the transmigration program, namely the internal migration of residents sponsored by the government. The transmigration program was first implemented in 1970 in South Sumatra Province and population migration occurred until around 1987. During this period, the population who moved to the South Sumatra area reached about 1 million people, most of whom lived in tidal swamp areas. In this tidal swamp area, the government builds a drainage network by distributing land an average of two hectares to each migrant to develop rice farming. According to Zahri et al (2018), rice farming in tidal areas has a larger scale and income than farmers in technical irrigation areas and Lebak.

To optimize the increase in rice production, the government has formulated a technology package adapted to the land's typology and the type of overflow as a reference in the application of the technology. The farming technology package in question is broadly in the form of (1) land and water management techniques that include regulation of water intake and output at both macro and micro levels, land management and management; (2) cultivation techniques which include cropping patterns or land use intensity, suitable varieties/types, fertilization, prevention and control of plant pest organisms (OPT).

In about 10 to 15 years since the arrival of migrants to a new area, farmers generally carry out rice farming once a year on their business land. However, after that, there was a change in the pattern of farmers' business, namely adopting plantation crops such as coconut, rubber and oil palm with a change in the function of land from rice cultivation to plantation crops. According to Zahri et al. (2019), changing from rice cultivation to oil palm plants does not benefit farmers. Local wisdom developed by farmers on land types B/C, C and D increased the planting index to IP 200. In addition to adopting plantation crops, farmers also adopted corn planting in their paddy fields by planting corn in the second planting season (MT 2) after planting rice in the first (MT 1). Before adopting maize, most farmers only planted rice on MT 1 in their paddy fields, and after that, their paddy fields were cleared, increasing their cropping from IP 100 to IP 200.

In addition to the increase in the cropping index, there has also been a change in agricultural cultivation with the development of agricultural mechanization in terms of land cultivation (using hand tractors and four-wheel tractors), planting using a direct sowing system (table), and harvesting using a combine harvester. There has been a change in tidal rice farming, which was initially labour-intensive to capital-intensive. The adoption of cropping pattern technology, the table system, and agricultural mechanization has encouraged the implementation of good agricultural practices in tidal swamp areas and increased the carrying capacity of sustainable tidal swamp natural resources.

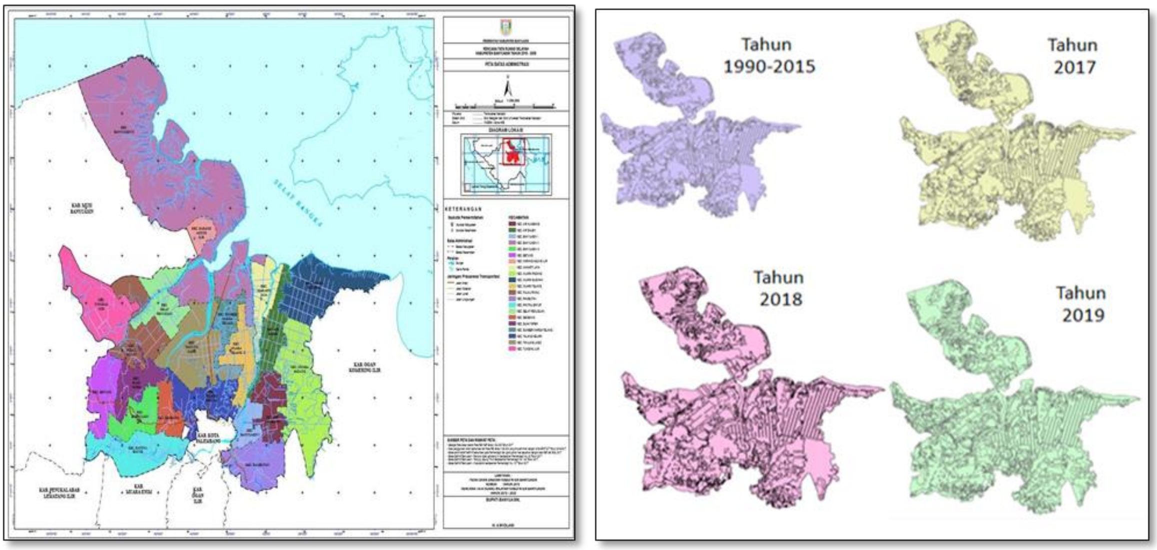


Figure 1: Changes in Land Cover Area from 1990 - 2019

When viewed from a historical point of view, the continued opening of the archipelago's tidal swamp areas initially occurred in the coastal swamp areas of South Kalimantan in the 1940s during the Dutch era. Beginning with immigrant farmers from the island of Java, it turns out that the development of tidal rice fields can survive there (Collier, William; 1973).

The opening of such coastal wetland areas began again in early 1974 in the tidal area of the Upang Delta (Musi Banyuasin Regency, South Sumatra at that time) close to the coast of the Bangka Strait.

The long lapse of time before the continuation of the clearing of swamp land in the second area, of course, should be suspected for a reason, including (Sjarkowi, F. 2022) :

(1) The program for opening rice fields in various archipelago regions after independence is still freely carried out in the remaining lebak (non-tidal) swamp areas.

(2) The program for clearing rice fields in non-tidal areas often goes hand in hand with the construction of technical and semi-technical irrigation systems and for equitable distribution of regional development.

(3) The development of tidal lowland rice production that has been taking place in South Kalimantan does face many obstacles because advances in tidal agricultural technology have not been accelerated.

Concerning the unconvincing experience in South Kalimantan , during the opening of the Upang Delta tidal rice fields, many agricultural experts with soil science backgrounds always warned against the initiators (in the New Order era, 1970s). It is warned to be careful and not to be in a hurry to expand tidal land clearing because there will be a danger of oxidation of the pyrite layer (FeSO3) when the thin peat layer on the top layer has been increasingly eroded over time.

On this scientific warning, the agricultural consultant team from IPB, in collaboration with experts from the Ministry of Agriculture required the existence of test farms in each tidal rice field ecology area which is considered to be unique in its water system and peat soil thickness (Go Ban Hong, 1975; Arsyad, Sitanala; 1980).

Meanwhile, the precautionary principle amid worries continues to be a reference for developing tidal areas. In South Sumatra, the expansion of the opening of tidal swamp areas continued to spread to the Telang area in the 1980s and the Sugihan Ogan Ilir area (formerly part of OKI Regency) in the 1990s.

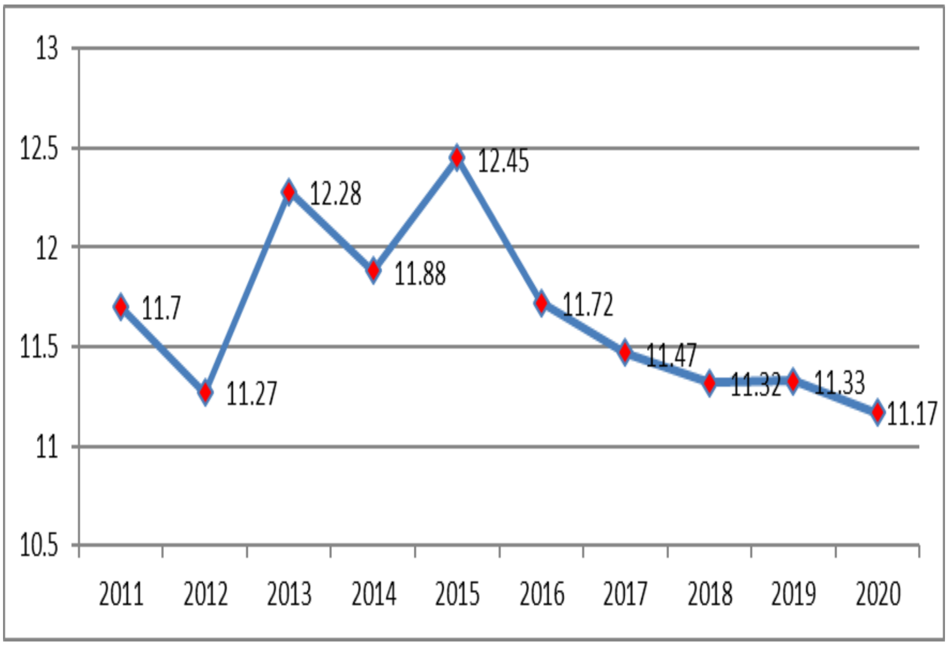
Field facts show that the problem of pyrite layer poisoning has never been an obstacle to rice farming in the tidal agroecosystem there. The dynamic that continues to develop is that the conversion of cropping land continues from rice fields and cassava plantations turned into oil palm plantations. The data in Table 1. Below shows the five-year development of planted areas and lowland rice production, oil palm and cassava from 1981 to 2020, especially in tidal areas.

Table 1: Data on the production area of rice, cassava, and oil palm in Banyuasin Regency from 1981 to 2020

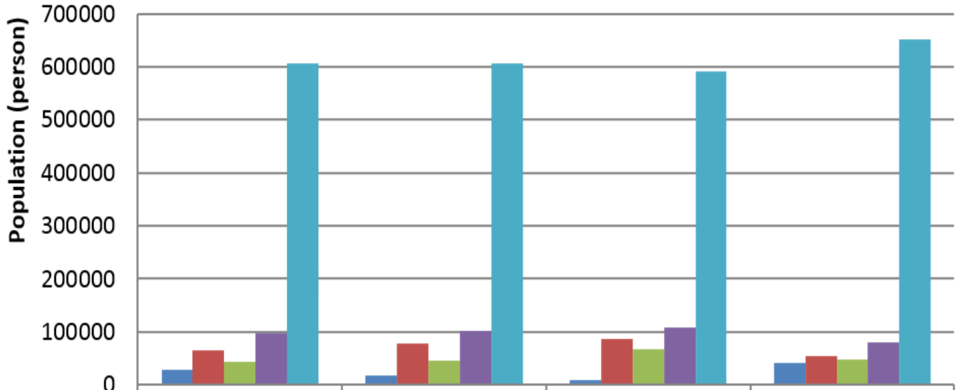
Year	Plant Area (Ha)	Paddy Production (Tons)	Plant Area (Ha)	Cassava Production (Tons)	Plant Area (Ha)	Palm oil Production (Tons)
1981 to 1985	160,369	455.002	3520	41,279	6.483	32.157
1986 to 1990	234,097	524,606	3992	46,443	13,583	84,628
1991 to 1995	205.377	517,896	2743	24,332	17,942	158,798
1996 to 2000	188,152	625,932	5750	54,143	46,481	252.206
2001 to 2005	167,711	605.605	4475	55,192	47,180	335.588
2006 to 2010	178,027	704.895	2168	25,923	75,978	348,002
2011 to 2015	212,402	959,654	1643	25,182	148,802	624,695
2016 to 2020	235,705	1,139,091	1759	50,939	191.230	530,078

Source: Processed from Various Sources, 2022

All the recorded developments are of course very closely related to the development of the welfare level of the farming community around the area listed in the table above. The relationship with changes in the poverty rate in Banyuasin Regency can also be shown in Figure 2. Below:



Based on Figure 2 . It can be seen that the trend of poverty in Banyuasin Regency in the last 10 years has continued to decline from 11.70% in 2011 to 11.17% in 2020 . As shown in the table, the positive but less rapid development certainly needs to be clarified in its relationship with the dynamics of local tidal land fertility. It will be clearer what the actual situation is in the field if the facts on the ground about the peasants' welfare in the tidal areas are related to the technological and socio-anthropological changes in the District. Banyuasin, South Sumatra Province. The total population by Poverty Status can be seen in the table below:



	2018	2019	2020	2021
Sangat Miskin	29056	18048	10016	41340
Miskin	65788	78505	86252	54213
Hampir Miskin	42728	46058	66390	48408
Rentan Miskin Lainnya	97051	102655	107736	80068
Tidak Miskin	606454	606739	591637	651604

4.1 Techno-Agronomy Developments in Rice Planting Season Activities 1975-2020.

The development of techno-agronomy that penetrates into all sectors of human life is also inseparable from its influence in the agricultural sector, where the development of agriculture goes hand in hand with the progress of modernization. According to Nurmala et al, (2012) Agriculture is a culture that was first developed by humans as a response to the challenge of survival which gradually becomes difficult due to the depletion of food sources in the wild due to the rate of human growth. In addition, agriculture as a system in human life aims to produce basic materials with the efficient use of natural resources in order to achieve the welfare of human life. The records from 1975 to 2020 can be seen in the table below:

Table 2: Techno-Agronomy Changes for Farmers in Bayuasin Regency 1975-2020.

Year	Activity M Season T Anam		Productivity Notes	Techno-Agronomy
	Rainy Season	Season Drought		
1975	Growing Local Rice	fallow	The productivity of tidal rice fields is still relatively low, namely 1-2 tons of dry milled rice (GKG) per hectare. This lasted until the 1980s. This low productivity cannot be separated from the reality of tidal land conditions, some of which are peaty and acid sulphate. Hence, they are very different from land conditions in Java, so	At the beginning of the opening of the tidal area as a transmigration area, the average Javanese transmigrant farmer did not understand how to manage land in wetlands. The difficulty of farmers working on the land resulted in farmers experiencing crop failure and eventually selling their land (Jamal et al., 2002). Their farming system is by clearing the forest and

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			appropriate cultivation and management techniques are needed. In addition, the available infrastructure is also very minimal (Aswan et al., 1995; Aji, 2015; Wiro Sudarmo & Apriadi, 2001). The productivity data of Musi Banyuasin Regency has not been archived.	clearing it by slash-and-burn, then planting rice for several years. In addition to growing rice, they also cultivate coconuts planted on tudung-tudung, after the coconut trees are a few years old. The pillars were made even higher and deepened the existing trenches around the tudung/surjan. (Aswan et al, 1995).
1980	Growing Local Rice	fallow	The productivity of tidal rice fields is still relatively low, namely 1-2 tons GKG/hectare. This lasted until the 1980s. This low productivity cannot be separated from the fact that the land conditions are tidal, partly peat and acid sulfate, so it is very different from the land conditions in Java. Appropriate cultivation and management techniques are required. In addition, the available infrastructure is also very minimal (Aswan et al, 1995; Aji, 2015; Wirosudarmo & Apriadi, 2001). The productivity data of Musi Banyuasin Regency has not been archived.	At this stage, the transmigrants are still more concentrated on clearing agricultural land because they are not ready and with conditions that are very different from the land conditions in Java, where they came from (Aji, 2015). Between 1980 and 1989, 42 new varieties of rice were released, or almost half of the total varieties in the last 30 years. The development of varieties aims to produce varieties resistant to pests and diseases, especially the brown planthopper (Sumihardi & Hermanto, 2000).
1985	Plant local rice and a small number of superior varieties	Fallow and few plant palawija	The average local rice production can produce 3 - 3.5 tons of harvested dry grain per hectare, while the superior rice varieties can produce 4 tons of unhulled rice per hectare. Some still plant once a year (Aswan et al., 1995). Productivity data of Musi Banyuasin Regency was recorded at 23.00 quintals/ha.	Most cropping patterns are only one planting season a year because the transmigrant community does not understand the tidal land conditions, so adaptation is needed even though results are starting to show (Aswan et al., 1995). When drainage brings oxygen to the flooded soil, the pyrite is oxidised to sulfuric acid. Acidic sulfate soils develop if acid production exceeds the neutralizing ability of the parent material so that the pH drops to less than 4 (Rimwanich & Suebsiri, 1984; Dent, 1986)
1990	Growing local rice and few growing high-	Mostly fallow and few grow palawija	In general, the productivity of paddy fields on tidal land is still relatively low, namely 1-2	According to Aji (2015), the period from 1988 to 2005 was a period where there was much increase in the

	yielding varieties		tons GKG/ha. Productivity data of Musi Banyuasin Regency was recorded at 29.82 quintals/ha.	transmigration community in the Air Saleh Delta, where this stage was the formation of villages in the Air Saleh Transmigration Settlement Unit (UPT). This also happened in Telang and Tanjung Lago. At this stage, the most major development was the technical changes in agriculture in the UPT Air Saleh area. Besides that, the life of the transmigration community also began to appear to be reaping results. Most of the cropping patterns have only one growing season in a year, namely Rice-Bera
1995	Growing local rice and few growing high-yielding varieties	Mostly fallow and few grow palawija	The Agricultural Research and Development Agency is known that until 1999, the welfare of some transmigrants was still low, most of the water management facilities and infrastructure were incomplete or not functioning correctly, the Planting Intensity (IP) in this area was still low, namely once a year, the productivity of rice fields tides are still relatively low at 1-2 tons GKG/ha. Productivity data of Musi Banyuasin Regency was recorded at 31.00 quintals/ha.	Most cropping patterns are only one growing season yearly, with the maximum water requirement occurring in October. The second period is 261.35 mm or 17.42 mm/day. It plans to plant three planting seasons (Padi-Padi-Palawija) in one year in early October. Banyuasin variety with harvest age between 3.5 - 4.0 months after planting (Anonymous, 2000). For secondary crops, peanuts (harvest age ± 3 months) were chosen because these plants do not require large amounts of water and can increase the soil's nitrogen content to reduce the soil's acidity. For the following year, it is directed to apply the Paddy-Rice-Palawija cropping pattern. (Wiro Sudarmo and Apriadi, 1999)
2000	Planting season in October – November		Productivity data of Musi Banyuasin Regency was recorded at 33.60 quintals/ha.	Most cropping patterns still have one planting season a year, namely, Paddy-Bera, although some have started planting twice for only 5000 hectares, namely in the Telang Delta area (Banyuasin Agriculture & Livestock Service, 2005). Few still apply the Padi-Padi or Padi-Palawija pattern, even though the potential is very high. (Wiro Sudarmo and Apriadi, 2001).

2005	Planting season in October – November;	Especially in 2005 the average in February because season drought which long, until October and the condition of high tide and groundwater is still salty (Yanter et. al, 2005)	Production in 2004 showed the highest local rice production reached 2,500 kg/ha with a net income of Rp. 445,400/ha. The production of grain (Ciherang seeds) obtained by participating farmers by applying the recommended technology is higher than the method they have used so far or the method used by non-participating farmers. The yield obtained was 3,800 kg/ha or 52% higher than the usual method used by farmers (Yanter et. al, 2005). Productivity data of Banyuasin Regency was recorded at 38.07 quintals/ha.	Land preparation begins with manual slashing and spraying of pre-growing herbicides, plows, glebegs and harrows using a hand tractor. Transplanting, seeds are sown (Yanter et. al, 2005). There are more and more people who cultivate their fields more than once. Types A and B are cultivated for Rice-Rice-Corn, while Types B/C and C are cultivated for Rice-Corn-Corn. Corn planting can be done at the end of the rainy season or the beginning of the dry season in April-May (Suprihatin & Hutapea, 2015). The land management mechanism has begun implementing an environmentally friendly system by combining organic and inorganic materials containing Ameliorant (an ingredient to increase fertility through improving soil physical and chemical conditions) (Najiyati et al., 2005).
2010	MT I planting rice in October-November	Corn planting is done at the end of the rainy season or the beginning of the dry season, namely in April - May (Suprihatin and Hutapea, 2015)	In some farmers, low productivity, especially the Ciherang variety, was caused by blast disease (panicle neck rot). In Tanjung Lago Subdistrict farmers, in addition to the relatively high productivity level (5,540 kg/ha) compared to Muara Telang farmers (4,675 kg/ha) with a total cost of Rp 7,580,100 and Rp 8,130,891 per hectare, the profit rate with without taking into account the land rent value for farmers in Tanjung Lago is Rp 9,424,114 and for farmers in Muara Telang Rp 6,456,037 per hectare or with an R/C ratio of 2.29 and 1.82 , respectively. Management with micro water management (TAM) gives the yield of dry grain production for	Planting system Maximum 3 tillers/planting hole, legowo planting system. Fertilization is guided by the use of 'Leaf Color Chart' for N fertilizer (Urea 150 kg/ha) and the use of soil test lift for P (SP-36: 65.6 kg /ha) and K (KCl: 50 kg/ha) fertilization. (Hutapea, et al, 2010). Transmigrant and local farmers use urea fertilizer ranging from 200-300 kg/ha, SP36 50-100 kg/ha, and Ponska 50-100 kg/ha. Meanwhile, KCL fertilizer tends not to be used (Zakiah & Diratmaja, 2013). In the aspect of land management, land management is carried out using a tractor, plowing once and harrowing. According to the recommendations, other technological components, such as planting and weeding methods, are also relatively good. All farmers in all farmer groups Kec. Muara Telang and Kec. Tanjung Lago

			Punggur rice varieties lower than the continuous inundation treatment (Subowo et al. 2012). Productivity data of Banyuasin Regency was recorded at 42.48 quintals/ha.	conducts direct seed-planting activities simultaneously (tablela) by manually spreading the seeds and no longer using seedlings and tandur jajar (Zakiah & Diratmaja, 2013). The recommended technology in the form of urea fertilizer application of 200 kg/ha-1, SP-36 100 kg ha-1, KCl 100 kg ha-1, and integrated pest and disease control (IPM) were treated as essential treatments. During the study, fresh water was flushed on the TAM treatment 21 times (time interval ± 5-7 days). Subowo et al. 2012).
2015	In MT I (October-November) the community planted rice and many have applied the rice-corn or rice-corn-corn pattern (Marlina, et al, 2015). Farming pattern of rice-corn rotation of respondent farmers in Suka Damai Village is the cultivation of plants carried out in turns consisting of MT I rice and MT II corn. (Umikalsum, 2018)	The community uses MT II and MT III by planting corn (mostly) or other commodities such as watermelon (Marlina, et al, 2015)	The average rice production is 4-5.5 tons /ha, while corn production is around 3 tons of shelled corn/ha (Marlina et al, 2015). In another study, the average rice production was 4,620.83 kg/ha with a selling price of Rp.4,000/kg, so the farmers' income from rice farming was Rp. 18,483,333.33, while the corn production produced by farmers is on average 5,818.01 kg/ha with a selling price of Rp.3,200/kg, the income from corn farming is Rp.18,617,632, so the total income of farmers for this cropping pattern is Rp. 37,100,980,39,- (Umikalsum, 2018). Production of Inpari 15 (4.9 tons GKP/ha), Inpari 22 (6.8 tons GKP/ha), Inpari 30 (6.1 tons KGP/ha) and Inpara 4 (7.0 tons GKP/ha) (Guwat et al. , 2017). The productivity of farmers in Tanjung Lago sub-district, in addition to the productivity level of 5,540 kg per ha, is relatively high compared to Muara Telang, which is 4,675 kg per ha (Zakiah and	In the district. Tanjung Lago Mulyasari Village and its surroundings recognize 3 planting periods in one year, namely by cultivating rice (MT1), corn (MT2) and corn (MT3) (Marlina, et al, 2015). One of the keys to the success of farming in Mulyasari Village lies in water regulation. First, water management in agricultural land through several channels, namely rural channels (SPD), tertiary channels and quarter channels (worm channels). Second, the conservation efforts are water management arrangements through SDU, SPD, tertiary and quarter channels (Helfa & Putri, 2018). The method of cultivating rice and corn in Suka Damai Village is as follows: seedling rice cultivation is carried out by sowing seeds. Soak the seeds overnight. The seeds used are mostly TW seeds. According to them, this type of rice is more resistant to pests and diseases and produces more seeds than others. Then do the nursery, planting and land care, pest and disease prevention and harvesting. Meanwhile, for maize cultivation, the stages of land

			Diratmaja, 2015). The average harvest in Mulyasari Village, Tanjung Lago District -is around 4 7.5 tons/ha/harvest with a gross income of around Rp. 9,000,000.00 - 30,000,000.00/ha/harvest (Rahmi, et al, 2015). Productivity data of Banyuasin Regency was recorded at 48.78 quintals/ha.	cultivation, planting and maintenance, and harvesting are carried out (Umikalsum, 2018). Land processing activities, a technological component in PTT, have technically been implemented well. This is indicated by all respondent farmers in all groups who have 100 percent carried out land processing using tractors, namely plowing once and harrowing. Other technological components, such as planting and weeding methods, are also relatively good for farmers following the recommendations (Zakiah and Diratmaja, 2015).
2020	Planting Season I planting high-yielding rice varieties	MT II and III planting palawija (maize, soybeans, long beans and some watermelons)	The four rice varieties tested productivity gave a relatively high yield of 5.6-6.2 tons of GKP/ha (Maryana, et. al., 2022). Meanwhile, Thony and Novitarini 's research showed that the average rice production grown on MT I in Tanjung Lago District was 5.3 tons GKG/ha. Productivity data of Banyuasin Regency was recorded at 43, 43 quintals /ha.	Banyu urip village is a potential land typology with type B overflow. Farming one plant, land arrangement and micro water management for farmers is carried out with a one-way system. This system's tertiary channel has a single function as a water inlet and outlet channel. The cropping system that farmers in Bayu Urip Village mainly do is the direct seed sowing system (Tablela), and some use the planting method using an amateur planting tool that is pulled by a tractor and modified according to the spacing of tiles and legowo and can be adjusted to the condition of the layers. Deep or shallow soil, makes it easier and saves time for planting (Thony & Novitarini, 2020). Land preparation was carried out by making circular trenches and dividing trenches between treatment plots. Soil tillage is done perfectly (OTS): the first tillage using a plow and the second using a rake. In the second tillage, the scattering added 500 kg/ha of agricultural lime ($CaCO_3$) (Maryana et al., 2022).

The direct impact of techno-agronomy changes is the ease of doing activities. It can ease the burden of human work against technology's positive and negative sides. On the one hand, technology has positively brought blessings in the sense that it can improve the welfare of human life, especially in the development of technology in the field of agricultural technology that can help ease the work of farmers. Extensive land management makes farmers need a long time without technology. However, on the other hand, the negative impact on agricultural technology is also very significant. Previously, farmers planted chillies and tomatoes and other vegetables and watered them manually by watering them every day and giving compost, now because the soil conditions are not the same as before, they have to be watered with a pump, and pesticides need to be used to repel and kill plant pests. The use of pesticides is proof of technological progress, but pesticide substances that stick to fruit and then are eaten will be hazardous if consumed regularly. In addition, the use of pesticides will also make pests that are not killed stronger. Another impact of using technology is the relatively high cost. With high costs, of course, the selling value of the harvest will be high, and this is not good for residents who are still less well off especially if the expensive crops are basic needs of the population such as rice.

4.2 Techno-Economic and Socio-Economic Developments of Farmers' Anthropology 1975-2020.

Society is a social system in which society is constantly changing. No society does not experience change, even if on a trim level, society (which consists of individuals) will always change (Martono, 2012, p. 1). Prasetyo in Karim (2012: 64) socio-cultural change is a symptom of changing social structures and cultural patterns in a society. Socio-cultural change is a common phenomenon that occurs throughout the ages in every society. These changes occur following the nature and nature of humans who always want to make changes. In addition, Greenwood and Guner (2008) state that social change is a characteristic of a society characterized by changes in attitudes and behavior to obtain better life benefits. Changes in attitudes and behavior can be caused by the entry of new technology or new options for improving their welfare. Basically, in any society, modernization and social change are always processes, although the speed and direction of the changes vary. The change process will sprint if a society is open to new things. These changes cover various social, economic, and cultural fields. Techno-economic and socio-anthropological developments, especially in this research area, can be seen in the table below:

Year	Techno-Economics	Socio Anthropology
1975	Transmigrant farmers mostly plant using local rice types, such as cisadane and pelita as well as superior varieties of rice such as IR 46, IR 42 and Ir 64. Of the two types of rice plants that are widely planted by transmigrant farmers are local types of rice, which reaches 60 percent, while 40 percent grow superior varieties of rice (Aswan et al, 1995).	Not all transmigration communities plant rice in their paddy fields at this time of year. Some only plant cassava and corn. Most farmers who grow rice have not cultivated their land and only clean it with a machete and do not use grass poison much. After the seedlings are ready to move/plant from the nursery, they are immediately planted (using a planting tool called a planting canopy) in the cleared paddy field area. The harvest method is still very traditional, using ani-ani, to separate the rice from the stem by trampling it with feet (the term diiles).
1980	Still, like in the 1970s, most of them use local varieties of rice plants grown by transmigrant farmers, namely local rice types such as cisadane and pelita, as	Farming communities in terms of cultivating their paddy fields have used hoes and used buffalo as towing plows for their fields. Before processing the soil, the grass is sprayed with

	well as superior varieties of rice such as IR 46, IR 42 and Ir 64. Of the two types of rice plants, many Planted by transmigrant farmers are local types of rice, which reaches 60 per cent, while 40 per cent grow superior varieties of rice (Aswan et al., 1995).	pesticides (grass poison). The harvest method is still using the ani-ani tool, and to separate the rice from the stems by trampling with the feet (the term diiles) and some being beaten using coconut or wood fronds.
1985	Still not much different, there are two types of rice plants planted by transmigrant farmers, namely local rice types such as cisadane and pelita and superior varieties of rice such as IR 46, IR 42 and IR 64. Of the two types of rice plants are mostly planted by farmers Transmigrants are local varieties of rice, which is 60 percent, while 40 percent grow superior varieties of rice (Aswan et al, 1995).	Most of the land cultivation uses buffaloes to plow their fields and a small part still uses the hoe. After the seeds are planted in the nursery, they are ready to be moved to be planted in the fields. Planting is still using the crown. The harvest method is still using the ani-ani tool, and some have also used an ordinary sickle. To separate the rice from the stems, it is rarely polished, but using a wooden gepyokan which is arranged in a triangular shape and some of it is beaten with a coconut frond.
1990	Similar to previous years, the types of rice planted by transmigrant farmers are local rice types such as cisadane and pelita as well as superior varieties of rice such as IR 46, IR 42 and IR 64. Of the two types of rice plants are mostly planted by farmers Transmigrants are local varieties of rice, which is 60 percent, while 40 percent grow superior varieties of rice (Aswan et al, 1995).	In terms of land cultivation, farming communities rarely use hoes, and some still use buffalo as their plow and some use hand tractors. Nurseries are not only in the rice fields, but also directly in the rice fields, so that they can be planted directly using the tandur system and some are still using the canopy. Ani-ani harvesting tools are rarely used, and switch to ordinary sickles and saws sickles. To separate the rice from the stems, a wooden gepyokan/sabetan tool is still used, and a small number are already familiar with the manual rice thresher using a chain, bicycle model.
1995	In 1988-1999, the pad variety IR 64 dominated the rice planting area and replaced Cisadane with PB36 because IR64 had high yields, short life and had a better taste. In 1999 the IR64 and Cisadane rice varieties dominated on the island of Java up to 81.1 %.	Almost all of the farming communities in terms of processing their paddy fields have used hand tractors and paddy plows with buffaloes have begun to be abandoned. The nursery has been directly planted in the rice fields and the planting is done using a tandur system directly by hand without using a planting canopy again. The rice harvester uses an ordinary sickle and a saw sickle. And to separate the rice from the stems, a rice thresher uses a machine. Meanwhile, gepyokan or sabetan are rarely used.
2000	Most of them still use local rice varieties (Wirosudarmo and Apriadi, 2001). Commonly used local varieties are Surumpun, Palembang Sticky Rice, Beard, Ant Ketek, Foreskin, and Rice Lembu (Kodir et al., 2015). There are some who use superior varieties such as Cisanggarung , Cisadane, Cisokan, IR42, and IR66 (Sastraatmaja, and Dadan, 2000). Based on data from the Banyuasin Agriculture Service (2003) apart from rice, there are several seasonal crops grown by the community, namely corn, soybeans, peanuts, green beans, cassava and sweet potatoes.	To cultivate the land, all farmers use machine tools (handtractors). There is a modification of the hand tractor tool to try rice cultivation, but most of the crops still use the tandur system without using the crown again. Almost all farmers use a saw to harvest, and the ordinary sickle is rarely used. Separating rice from the stems in addition to using a tresseer, a rice thresher, which in its development is always changing with a larger capacity and still a small part of it using wooden gepyokan.

2005	Varieties: Fatmawati, Ciherang and Widas with a volume of 30 kg/ha (Yanter et. al, 2005). Integration of integrated agricultural technology innovations: rice, corn and cattle cultivation that supports soil and water cultivation is a technological innovation introduced to farmers in the Primatani Program in Telang Rejo village, Kec. Muara Telang around 2007 to 2009 (Manisah and Nasir, 2016). Local varieties are still used, such as Surumpun, Ketan Palembang, Beard, Ketek Semut, Ketek Kulup, and Lembu Sawah (Kodir et al., 2015).	Farming communities to cultivate their land have all used alsintan (handtractor complete with harrow and glebeg). In terms of planting, most of the farmers are still fertile and there are very few pilots who try to plant direct seeds (tabela). Harvesting tools still use saws and sickles are no longer used. Harvest threshers have dominated enough and the gepyokan have been abandoned. A small number of farmers have tried planting twice a year, namely rice, although the results have not been satisfactory.
2010	New Superior Varieties (Ciherang, Mekongga, etc.) ♣Labeled ♣Maximum 25 kg/ha (Hutapea, et al, 2010). Almost all farmers have used high-yielding seeds with relatively the same varieties, namely the Ciherang variety, but none of the local farmer respondents have planted the Inpari variety and other new high-yielding varieties such as Mekongga, Cibogo (Zakiah and Diratmaja, 2013). There is still the use of local varieties such as Serumpun, Palembang Sticky Rice, Beard, Ant Ketek, Yellow Lembu, Rice Lembu, and Tapanuli (Kodir et al., 2015)	In terms of land management is quite perfect. Before being plowed, the land is sprayed with grass poison, then plowed and harrowed, then diglebeg to prepare for planting. In terms of planting, almost half of the farmers have implemented direct seed planting (tabela) and some are still using the tandur system. Harvesting tools still use a saw sickle with a larger capacity harvesting thresher which is enough to dominate its use. Almost some farmers have tried crops twice a year, namely rice and corn.
2015	With IP 200 or IP 300 it is proven that food crop farming is more profitable than oil palm business (Marlina et al, 2015). The most widely used rice varieties are IR 42 Ciherang, Vietnam, Pertiwi and Situbagendit. While the corn varieties used are pioneers and motherland 3. Apart from corn, there are also those who grow watermelons (Marlina et al, 2015). The low income of rice farming encourages the growth of social rationality through diversification, developing other farming businesses besides rice, namely soybean and long bean farming as well as conducting non-agricultural businesses (Andriani, 2015). The cropping pattern carried out in Mulyasari Village is a polyculture cropping pattern, namely multi-cropping, a one-year cropping pattern in the order of rice, watermelon and corn, in the following order from November to February the plots of land are planted with rice plants. In April - June farmers plant watermelon plants that do not really need water. And for the months of July-September the land is planted with corn (Helfa and Putri, 2018). Generally, the superior varieties	In terms of land cultivation using a hand tractor, it is quite perfect, and some farmers have also started using more sophisticated four-wheel tractors. In terms of planting, almost all farmers in the ups and downs have implemented direct seed planting (tabela) and the tandur system has been abandoned. Harvesting equipment still uses a saw sickle with a larger capacity harvesting thresher and some farmers have started using a more sophisticated combine harvester. There have been many farmers who apply the crop 2 times a year and the results are quite satisfactory.

	planted are Ciherang and some farmers have planted Inpari-4 on the basis of choosing to be more resistant to blast disease (panicle neck rot). Other varieties are Mekongga, IR42, Situbagendit, and Cibogo (Zakiah and Diratmaja, 2015). There is still the use of local varieties such as Serumpun, Lembu Kuning, Lembu Sawah, and Tapanuli (Kodir et al., 2015).	
2020	Variety is one of the important components in the production system in an effort to increase rice production, especially on tidal land. Varieties that have high yield potential are Ciherang, IR42 and IR64 (Thony and Novitarini, 2020). The use of new high yielding rice varieties (Hipa 18, Hipa 20, Hipa 21) grown using Amator produced higher rice plants, more tillers and longer panicles than the inbred variety (Inpari 22) grown using either amator or sonor or table. (Maryana, et. al., 2022). The varieties that are widely used in Tanjung Lago District are high-yielding rice varieties specific to tidal lands including Inpara 1, Inpara 2, Inpara 3, Inpara 6, Inpara 7, Inpara 8 Agritan and Inpara 9 Agritan .	In terms of land cultivation, some farmers in general have used more sophisticated four-wheel tractors, and only a small number of hand tractors in rice fields are not yet good. In terms of planting, almost all farmers in the ups and downs have implemented direct seed planting (tabela) and modification of the Amator tool. All of the harvesting tools have used a sophisticated harvesting tool, namely a combine harvester. Planting in 1 year, some farmers have applied 3 times a year, namely rice-rice-corn/watermelon and the results are quite satisfactory.

4. CONCLUSION

Social changes will continue as long as there is interaction between humans and people in society. Social change occurs because of changes in the elements that maintain a balanced society, such as the elements of techno-agronomy and socio-anthropology. Social changes in society should not be seen from one side only because these changes can result in a shift to improve their welfare. On the other hand, these basic needs significantly affect the socio-anthropological conditions of society. Their culture cannot develop because of the situation and conditions of those who live in poverty because society wants change. Change can also occur because of external encouragement so that people, consciously or not, will follow the changes. Such as due to the development of various sectors, especially technology.

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